
**Toxicology of Smokeless Tobacco Products:
Bacterial Reverse Mutagenicity**

***Labstat International ULC
Test Report***



***Prepared for
R.J. Reynolds Tobacco Corporation***

Project Code: M97

**Original Date: October 9, 2008
Revision 1 Date: October 17, 2008
Revision 2 Date: October 26, 2009
Revision 3 Date: December 15, 2009
Revision 4 Date: December 22, 2010**

1	USE OF LABSTAT'S ANALYTICAL REPORTS.....	4
2	ADMINISTRATIVE INFORMATION.....	5
2.1	Quotation Reference	5
2.2	Client Identification	5
2.3	Date of Sample Receipt	5
2.4	Sample Characteristics	5
2.5	Test Article Identification	5
2.6	Special Instructions	5
2.7	Date of Test Report	6
2.8	Revision History	6
2.8.1	Revision 1.....	6
2.8.2	Revision 2.....	6
2.8.3	Revision 3.....	6
2.8.4	Revision 4.....	6
3	ACCREDITATION	6
3.1	Scope (refer to appendix A).....	6
3.2	International Recognition of Tests	7
4	METHODS.....	7
4.1	Total Particulate Matter Collection and Preparation	7
4.1.1	Collection of Total Particulate Matter (TPM).....	7
4.1.2	Processing of TPM	7
4.2	Smokeless Tobacco Sample Preparation	7
4.3	Mutagenicity Testing (Health Canada Official Method T-501)	8
4.3.1	Synopsis.....	8
4.3.2	Preparation of Tester Strain	8
4.3.3	Treatment of Samples	8
4.3.4	Exogenous Metabolic Activation.....	8
4.4	Nicotine and Moisture Contents of Smokeless Tobacco Products	8
4.5	Method Deviations.....	9
5	RESULTS	9
5.1	Data Files	9
5.1.1	Moisture-Corrected, Nicotine and 'Unit of Use' Doses	9

5.2	Quality Control.....	9
5.2.1	Genotypes of the Tester Strains and Bacterial Growth	9
5.2.2	Evaluation of Negative Controls	10
5.2.3	Evaluation of Positive Controls.....	11
5.2.4	Evaluation of Laboratory Controls (Kentucky Reference 3R4F)	11
5.2.5	Precipitation/Toxicity	12
6	MUTAGENICITY COMPARISONS	13
6.1	Data Files	13
6.2	Methodology.....	13
6.3	Specific Activity Determinations	14
6.4	Comparisons Among Smokeless Tobacco Products.....	14
6.4.1	Replicate Specific Activity Slopes and Slope Statistics	14
6.4.2	Data Plots.....	14
6.4.3	One-Way ANOVA Results.....	14
6.4.4	Contrasts of Interest	17
6.5	Comparisons Between Smoked and Smokeless Tobacco Products	27
6.5.1	Replicate Specific Activity Slopes and Slope Statistics	27
6.5.2	Data Plots.....	28
6.5.3	One-Way ANOVA Results.....	28
6.5.4	Contrasts of Interest	29
7	SUMMARY	38
8	ATTRIBUTION	39
8.1	Original.....	39
8.2	Revision 1.....	39
8.3	Revision 2.....	39
8.4	Revision 3.....	40
8.4.1	Technical Director (Toxicology)	40
8.4.2	Senior Statistician.....	40
8.5	Revision 4.....	40
8.5.1	Technical Director (Toxicology)	40
8.5.2	Senior Statistician.....	41

1 Use of Labstat's¹ Analytical Reports²

Labstat International ULC is a recognized centre of analytical excellence related to tobacco and tobacco products. Our clients include major international tobacco manufacturers, various Governments and Government agencies such as the Canadian Federal Department of Health and the Massachusetts Department of Public Health, agricultural interests, university researchers and private research interests. Normally our contractual obligations extend **only** to the provision of data and related reports.

It should be noted³, in this regard, that

All analytical data and reports, provided by Labstat International ULC, are for the exclusive use of the person, partnership, or corporation to whom it is addressed, and neither the data, the report nor the name of the laboratory (Labstat International ULC) nor any member of its staff may be used in connection with the advertising or sale of any product or process without written authorization from the CEO of the company or his designate. Labstat International ULC is not responsible for unauthorized use of test reports.

The following also applies to reported data.

All Labstat reports on testing relate only to the sample received and tested by it at the time of testing. Labstat warrants that all samples submitted were tested in accordance with its standard test procedures. Except as stated herein, there is no warranty expressed or implied, statutory or other wise, as to the results of Labstat tests. Labstat does not warrant or guarantee the fitness of the materials from which the samples have been drawn for any particular purpose including without limitation for consumption as cigarettes, cigars, smokeless tobacco or any other form of tobacco or tobacco-related product.

¹ Labstat International ULC,
262 Manitou Drive, Kitchener, ON Canada N2C 1L3
Phone: (519) 748-5409; Fax: (519) 748-1654; Email: labstat@labstat.com

² *This document may not be reproduced, in whole or in part in any form, without the written consent of the author(s) on behalf of Labstat International ULC*

³ *Unless superseded by a specific contractual obligation or other written agreement.*

2 Administrative Information⁴

2.1 Quotation Reference

Quotation Number: T2645

Date of Quotation: August 28, 2008

Recipient's Name: Dr. Suzana Theophilus

2.2 Client Identification

R.J. Reynolds Tobacco Corporation
950 Reynolds Boulevard
Winston-Salem NC 27102-1487
USA

2.3 Date of Sample Receipt

Five samples to be tested for M97 were received on September 16, 2008 via UPS.

2.4 Sample Characteristics

The shipment received on September 16, 2008 consisted of one Ziploc bag of one product, one plastic container for each of 2 products, 91 boxes of one product and 20 tins of one product. There was no physical damage to the containers, bag or tins. Individual sticks and strips were normal in appearance.

2.5 Test Article Identification

The following sample codes have been used to identify the products associated with the results in each of the tables that are part of this report.

Sample ID	Sample Description
084394	Camel SNUS Frost
084395	2S3 Research Moist smokeless tobacco
084396	Kentucky Reference 2R4F
084454	Fresh Strips
084455	Mellow Sticks
084456	Copenhagen Long Cut
084457	Ariva Wintergreen
084458	Fresh Orbs

2.6 Special Instructions

As requested by the client, "Camel Snus Frost" and "2S3 Research Moist smokeless tobacco" were removed from inventory remaining from projects M78L and M78M. Labstat International ULC supplied "Kentucky Reference 2R4F".

⁴ Provided in accord with International Standard ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories" Section 5.10

2.7 Date of Test Report

Original: October 9, 2008

Revision 1: October 17, 2008

Revision 2: October 26, 2009

Revision 3: December 15, 2009

Revision 4: December 22, 2010

2.8 Revision History

2.8.1 Revision 1

This revision was required due to client communication, following the initial submission of the report, requesting further data analysis.

2.8.2 Revision 2

This revision was required due to client request for re-analysis and additional information following the submission of the revised report with added data analysis and subsequent conference calls with the client regarding specific data analysis methodologies to be used (client CRO # 2009-004).

2.8.3 Revision 3

This revision was required due to a client request for additional analysis following the submission of the revision 2 report (client CRO # 2009-012-M97-Ames).

2.8.4 Revision 4

This revision was required due to a client request for additional analysis on a 'unit of use' basis for the smokeless tobacco products tested (client CRO # 2010-014-Smokeless-R1).

3 Accreditation

3.1 Scope (refer to [appendix A](#))

Labstat International ULC has been accredited by the Standards Council of Canada to International Standard ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories" with a scope that includes all of the mandated tobacco-related Health Canada methods (see Tobacco Reporting Regulations dated 26 June 2000, Canada Gazette Part II, Vol. 134, No. 15 Schedules 1, 2 and 3 pages 1780 – 1785). The testing included in this report is within the scope of this accreditation, unless otherwise noted in Section 4.



Accredited LAB 368

(SCC Accreditation & Design Mark is an Official Mark of the Standards Council of Canada, used under license)

3.2 International Recognition of Tests

Our accrediting organization, Standards Council of Canada, is one of a number of such member bodies participating in a global mutual recognition agreement (MRA), known as the ILAC (International Laboratory Accreditation Cooperation) Arrangement. The arrangement, effective January 31, 2001, requires acceptance of technical test data from accredited laboratories by member bodies in numerous international economies.

4 Methods

4.1 Total Particulate Matter Collection and Preparation

4.1.1 Collection of Total Particulate Matter (TPM) ⁵

(b) (4)



4.1.2 Processing of TPM

(b) (4)



4.2 Smokeless Tobacco Sample Preparation

(b) (4)



⁵ See International Standard ISO 4387 Cigarettes – Determination of total and nicotine-free dry particulate matter using a routine analytical smoking machine (Reference number ISO4387:2000)

⁶ Health Canada 100% Vent Blocking Method

6(b)(iii) all ventilation holes must be blocked by placing over them a strip of Mylar adhesive tape, Scotch Brand product no. 600 Transparent Tape, and the tape must be cut so that it covers the circumference and is tightly secured from the end of the filter to the tipping overlap seam, or by another method of equivalent efficiency.

⁷ DMSO is the most useful solvent for mutagenicity assays because it dissolves a wide range of chemicals, is relatively non-toxic to the bacteria and to the microsomal S9 enzymes, and is completely miscible with molten top agar.

(b) (4)

4.3 Mutagenicity Testing (Health Canada Official Method T-501)

4.3.1 Synopsis

(b) (4)

4.3.2 Preparation of Tester Strain

(b) (4)

4.3.3 Treatment of Samples

(b) (4)

4.3.4 Exogenous Metabolic Activation

(b) (4)

4.4 Nicotine and Moisture Contents of Smokeless Tobacco Products

Test methods for the analysis of processed tobacco are referenced in the table below and were practiced as written.

OFFICIAL METHODS FOR THE COLLECTION OF DATA ON CONSTITUENTS⁸

Item	Constituent	Official Method
1.	Nicotine	Official Method T-301, <i>Determination of Alkaloids in Whole Tobacco</i>
2.	Moisture	AOAC Official Method 966.02, <i>Moisture in Tobacco, Gravimetric Method</i>

⁸ Canadian Tobacco Reporting Regulations: 2000-01-19 *Canada Gazette Part II, Vol. 134, No. 15* Part 3: Emissions from Designated Tobacco Products. Test method numbers refer to Health Canada methodologies which have been posted by Health Canada on the internet at site http://www.hc-sc.gc.ca/hl-vs/tobac-tabac/legislation/reg/indust/index_e.html

4.5 Method Deviations

(b) (4)

5 Results

5.1 Data Files

Individual results and the corresponding sample statistics may be found on the compact disk (CD) that accompanies this report. The data files have been labeled *M97_ames_tpm_dataCF.xls* (Ames results for TPM of tobacco brand 084396), *M97_ames_wt_dataCF.xls* (Ames results for smokeless tobacco products), *M97_chem_wt_dataCF.xls* (nicotine and moisture analysis results for smokeless tobacco products).

5.1.1 Moisture-Corrected, Nicotine and 'Unit of Use' Doses

(b) (4)

5.2 Quality Control

5.2.1 Genotypes of the Tester Strains and Bacterial Growth

5.2.1.1 Requirement

(b) (4)

(b) (4)

5.2.1.2 Conclusion

Strain	Assay Date	Lot #	Viability (x 10 ⁹ cells/mL)	Genotype Testing					
				R-factor	rfa	uvrB	Histidine/Biotin	Biotin	Tetracycline
TA98 (+S9)	19-Sep-08	2276	1.30	+	16 mm	-	+	-	n/a
TA98 (+S9)	24-Sep-08	2276	1.43	+	17 mm	-	+	-	n/a
TA98 (-S9)	19-Sep-08	n/a	1.30	+	16 mm	-	+	-	n/a
TA98 (-S9)	26-Sep-08	n/a	1.19	+	17 mm	-	+	-	n/a
TA100 (+S9)	19-Sep-08	2276	1.17	+	18 mm	-	+	-	n/a
TA100 (+S9)	26-Sep-08	2276	1.19	+	17 mm	-	+	-	n/a
TA100 (-S9)	19-Sep-08	n/a	1.17	+	18 mm	-	+	-	n/a
TA100 (-S9)	26-Sep-08	n/a	1.22	+	19 mm	-	+	-	n/a
TA102 (+S9)	19-Sep-08	2276	1.51	+	19 mm	+	+	-	+
TA102 (+S9)	26-Sep-08	2276	1.33	+	18 mm	+	+	-	+
TA102 (-S9)	19-Sep-08	n/a	1.51	+	19 mm	+	+	-	+
TA102 (-S9)	26-Sep-08	n/a	1.64	+	16 mm	+	+	-	+
TA1535 (+S9)	23-Sep-08	2276	1.95	-	18 mm	-	+	-	n/a
TA1535 (+S9)	24-Sep-08	2276	1.56	-	14 mm	-	+	-	n/a
TA1535 (-S9)	23-Sep-08	n/a	1.95	-	18 mm	-	+	-	n/a
TA1535 (-S9)	24-Sep-08	n/a	1.52	-	17 mm	-	+	-	n/a
TA1537 (+S9)	23-Sep-08	2291	1.35	-	19 mm	-	+	-	n/a
TA1537 (+S9)	23-Sep-08	2291	1.36	-	18 mm	-	+	-	n/a
TA1537 (-S9)	23-Sep-08	n/a	1.35	-	19 mm	-	+	-	n/a
TA1537 (-S9)	24-Sep-08	n/a	1.40	-	19 mm	-	+	-	n/a

All of the appropriate genotypic characteristics were present for each strain used in producing the results that are part of this report. All bacterial cultures were found to have densities in excess of the minimum requirement of 1x10⁹ cells/mL defined in section 13.6.1 of T-501.

5.2.2 Evaluation of Negative Controls

5.2.2.1 Acceptance Criteria for Negative Controls

(b) (4)

5.2.2.2 Conclusion

All negative control assay results that are part of this report were found to be acceptable in regards to the above requirement. See the "[Control Summary](#)" sheet in the *M97_ames_Labstat Internal Controls.xls* data file for evaluation results.

5.2.3 Evaluation of Positive Controls

5.2.3.1 Acceptance Criteria for Positive Controls

(b) (4)



5.2.3.2 Conclusion

All positive control assay results that are part of this report were found to be acceptable in regards to the above requirements for positive control results. See the "[Control Summary](#)" sheet in the *M97_ames_Labstat Internal Controls.xls* data file for evaluation results.

5.2.4 Evaluation of Laboratory Controls (Kentucky Reference 3R4F)

5.2.4.1 Acceptance Criteria for Mutagenicity⁹

(b) (4)



⁹ Acceptance criteria have not been defined in the Official Health Canada Test Method T-501

¹⁰ A minimum of 30 results is normally required for the purpose of this comparison.

(b) (4)

5.2.4.2 Conclusion (Mutagenicity)

Strain	Assay Date	Target [rev./mg TPM]		Observed [rev./mg TPM]	Z Score	P Value
		Average	Std Dev			
TA98 (+S9)	19-Sep-08	1399	202	1228	0.847	0.397
TA98 (+S9)	24-Sep-08	1399	202	1457	-0.289	0.773
TA98 (-S9)	19-Sep-08	47.3	30.2	24	0.783	0.434
TA98 (-S9)	26-Sep-08	47.3	30.2	69	-0.716	0.474
TA100 (+S9)	19-Sep-08	580	148	522	0.395	0.693
TA100 (+S9)	26-Sep-08	580	148	367	1.444	0.149
TA100 (-S9)	19-Sep-08	189	76	283	-1.238	0.216
TA100 (-S9)	26-Sep-08	189	76	172	0.221	0.825
TA102 (+S9)	19-Sep-08	444	171	366	0.459	0.646
TA102 (+S9)	26-Sep-08	444	171	202	1.414	0.157
TA102 (-S9)	19-Sep-08	102	112	0	0.912	0.362
TA102 (-S9)	26-Sep-08	102	112	0	0.912	0.362
TA1535 (+S9)	23-Sep-08	13.5	14.1	0	0.955	0.339
TA1535 (+S9)	24-Sep-08	13.5	14.1	17	-0.268	0.789
TA1535 (-S9)	23-Sep-08	10.9	13.7	0	0.797	0.425
TA1535 (-S9)	24-Sep-08	10.9	13.7	0	0.797	0.425
TA1537 (+S9)	23-Sep-08	225	42	217	0.192	0.848
TA1537 (+S9)	23-Sep-08	225	42	228	-0.078	0.938
TA1537 (-S9)	23-Sep-08	23.8	14.9	0	1.596	0.110
TA1537 (-S9)	24-Sep-08	23.8	14.9	10	0.911	0.362

The results of the Kentucky Reference 3R4F assays necessitated by section 13.3.1 of T-501 were acceptable in regards to the criteria defined in section 5.2.4.1 of this report. Thus, it is reasonable to assume that the results reported for the test samples are reflective of the characteristics of the products as received and tested as described in section 4 of this report. See the [“Assay Acceptance Criteria”](#) sheet in the *M97_ames_Labstat Internal Controls.xls* data file for evaluation results.

5.2.5 Precipitation/Toxicity

5.2.5.1 Requirement

(b) (4)

5.2.5.2 Conclusion

Precipitation was not evident within the culture media used for this project or on any assay plate reported for this project. There was evidence of toxicity at the highest TPM concentration for each assay with the following exceptions for which all plates were comparable to the negative control:

- Set 2, Run 4 Sample ID 084454 (replicate 1) assay for strain TA1535 (+S9)
- Set 2, Run 5 Sample ID 084455 (replicate 1) assay for strain TA1535 (+S9)

6 Mutagenicity Comparisons

6.1 Data Files

Data files containing calculated specific activities (slope of the linear portion of the dose-response curve) may be found on the compact disk (CD) that accompanies this report. The data files have been labeled *M97_ames_tpm_stats.xls* (dose-response curve analysis results for CSC of tobacco brand 084396), *M97_ames_wt_stats_ST.xls* (dose-response curve analysis results for smokeless tobacco products on a 'mg extracted smokeless tobacco in DMSO' dose basis), *M97_ames_wt_stats_ST-H2O.xls* (dose-response curve analysis results for smokeless tobacco products on a 'mg extracted moisture-corrected smokeless tobacco in DMSO' dose basis), *M97_ames_wt_stats_Nicotine.xls* (dose-response curve analysis results for smokeless tobacco products on a 'µg extracted Nicotine in DMSO' dose basis) and *M97_ames_tpm+wt_stats_Nicotine.xls* (dose-response curve analysis results for smoked and smokeless tobacco products on a Nicotine dose basis).

6.2 Methodology

1. (b) (4)

2.

3.

4.

5.

6.3 Specific Activity Determinations

(b) (4)

6.4 Comparisons Among Smokeless Tobacco Products

6.4.1 Replicate Specific Activity Slopes and Slope Statistics

Tables of results were obtained for the individual replicate slope estimates and the summary statistics over the three replicate slopes for each smokeless tobacco test sample under each tester strain and S9 activation. The tables for each smokeless tobacco dose basis can be found on the 'Statistical Analysis' data sheet in the corresponding dose basis files *M97_ames_wt_stats_ST.xls* (extracted smokeless tobacco), *M97_ames_wt_stats_ST-H2O.xls* (extracted moisture-corrected smokeless tobacco), *M97_ames_wt_stats_Nicotine.xls* (extracted nicotine) and *M97_ames_wt_stats_Unit.xls* (units of use).

6.4.2 Data Plots

Plots of all replicate smokeless tobacco test samples can be found in the files *M97_ames_wt_stats_ST.xls*, *M97_ames_wt_stats_ST-H2O.xls*, *M97_ames_wt_stats_Nicotine.xls* and *M97_ames_wt_stats_Unit.xls* on the CD that accompanies this report. Box-and-Whisker plots of the calculated specific activities can also be found on the CD that accompanies this report.

6.4.3 One-Way ANOVA Results

One-way ANOVA comparisons of mean 'extracted smokeless tobacco', 'extracted moisture-corrected smokeless tobacco' and 'extracted nicotine' slope estimates among test samples yielded the following:

6.4.3.1 Revertants/mg 'Extracted Smokeless Tobacco in DMSO'

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
TA98 (+S9)	Among Samples	25.343	6	4.224	1.843	0.162
	Within Samples	32.086	14	2.292		
	Total	57.430	20			
TA98 (-S9)	Among Samples	3.336	6	0.556	1.922	0.147
	Within Samples	4.050	14	0.289		
	Total	7.387	20			
TA100 (+S9)	Among Samples	246.433	6	41.072	0.574	0.745
	Within Samples	1002.589	14	71.613		
	Total	1249.022	20			
TA100 (-S9)	Among Samples	463.375	6	77.229	1.496	0.250
	Within Samples	722.733	14	51.624		
	Total	1186.108	20			
TA102 (+S9)	Among Samples	6329.977	6	1054.996	11.796	< 0.001
	Within Samples	1252.092	14	89.435		
	Total	7582.069	20			
TA102 (-S9)	Among Samples	1218.568	6	203.095	1.207	0.359

¹¹ Margolin BH, Kaplan N, Zeiger E. Statistical Analysis of the Ames *Salmonella* microsome test. *Proc Natl Acad Sci USA* 1981;78: 3779-83.

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
	Within Samples	2355.101	14	168.222		
	Total	3573.669	20			
TA1535 (+S9)	Among Samples	0.617	6	0.103	0.186	0.976
	Within Samples	7.721	14	0.552		
	Total	8.338	20			
TA1535 (-S9)	Among Samples	12.845	6	2.141	1.366	0.294
	Within Samples	21.940	14	1.567		
	Total	34.785	20			
TA1537 (+S9)	Among Samples	29.062	6	4.844	1.882	0.154
	Within Samples	36.025	14	2.573		
	Total	65.088	20			
TA1537 (-S9)	Among Samples	16.687	6	2.781	4.767	0.008
	Within Samples	8.167	14	0.583		
	Total	24.854	20			

One-way ANOVA analysis indicates significant differences, at $\alpha = 0.05$, among mean 'Extracted Smokeless Tobacco in DMSO' slope estimates for test samples assayed with strains TA102 (+S9) and TA1537 (-S9).

6.4.3.2 Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO'

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
	Among Samples	99.097	6	16.516	4.070	0.014
	Within Samples	56.808	14	4.058		
TA98 (+S9)	Total	155.906	20			
	Among Samples	4.336	6	0.723	1.240	0.344
	Within Samples	8.159	14	0.583		
TA98 (-S9)	Total	12.496	20			
	Among Samples	3175.483	6	529.247	3.352	0.029
	Within Samples	2210.376	14	157.884		
TA100 (+S9)	Total	5385.859	20			
	Among Samples	1346.051	6	224.342	2.015	0.131
	Within Samples	1558.496	14	111.321		
TA100 (-S9)	Total	2904.547	20			
	Among Samples	15475.111	6	2579.185	7.046	0.001
	Within Samples	5124.874	14	366.062		
TA102 (+S9)	Total	20599.985	20			
	Among Samples	2807.624	6	467.937	1.231	0.348
	Within Samples	5321.469	14	380.105		
TA102 (-S9)	Total	8129.093	20			
	Among Samples	0.930	6	0.155	0.202	0.971
	Within Samples	10.747	14	0.768		
TA1535 (+S9)	Total	11.676	20			
	Among Samples	17.736	6	2.956	1.303	0.318
	Within Samples	31.763	14	2.269		
TA1535 (-S9)	Total	49.500	20			
	Among Samples	134.635	6	22.439	2.000	0.134
	Within Samples	157.035	14	11.217		
TA1537 (+S9)	Total	291.669	20			

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
TA1537 (-S9)	Among Samples	46.256	6	7.709	5.472	0.004
	Within Samples	19.723	14	1.409		
	Total	65.979	20			

One-way ANOVA analysis indicates significant differences, at $\alpha = 0.05$, among mean 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' slope estimates for test samples assayed with strains TA98 (+S9), TA100 (+S9), TA102 (+S9) and TA1537 (-S9).

6.4.3.3 Revertants/ μ g 'Extracted Nicotine in DMSO'

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
TA98 (+S9)	Among Samples	0.792	6	0.132	0.753	0.617
	Within Samples	2.454	14	0.175		
	Total	3.246	20			
TA98 (-S9)	Among Samples	0.127	6	0.021	2.344	0.089
	Within Samples	0.126	14	0.009		
	Total	0.252	20			
TA100 (+S9)	Among Samples	19.998	6	3.333	1.294	0.322
	Within Samples	36.059	14	2.576		
	Total	56.056	20			
TA100 (-S9)	Among Samples	14.802	6	2.467	1.504	0.247
	Within Samples	22.960	14	1.640		
	Total	37.762	20			
TA102 (+S9)	Among Samples	67.746	6	11.291	7.063	0.001
	Within Samples	22.380	14	1.599		
	Total	90.126	20			
TA102 (-S9)	Among Samples	69.157	6	11.526	1.134	0.393
	Within Samples	142.248	14	10.161		
	Total	211.405	20			
TA1535 (+S9)	Among Samples	0.026	6	0.004	0.214	0.966
	Within Samples	0.283	14	0.020		
	Total	0.309	20			
TA1535 (-S9)	Among Samples	1.866	6	0.311	2.372	0.086
	Within Samples	1.835	14	0.131		
	Total	3.700	20			
TA1537 (+S9)	Among Samples	0.174	6	0.029	0.863	0.544
	Within Samples	0.470	14	0.034		
	Total	0.644	20			
TA1537 (-S9)	Among Samples	0.144	6	0.024	1.534	0.238
	Within Samples	0.220	14	0.016		
	Total	0.364	20			

One-way ANOVA analysis indicates significant differences, at $\alpha = 0.05$, among mean 'Extracted Nicotine in DMSO' slope estimates for test samples assayed with strain TA102 (+S9).

6.4.3.4 Revertants/ 'Unit of Use'

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
TA98 (+S9)	Among Samples	116551558	6	19425260	9.277	< 0.001
	Within Samples	29314294	14	2093878.1		
	Total	145865852	20			
TA98 (-S9)	Among Samples	2382624.9	6	397104.15	1.145	0.388
	Within Samples	4856477	14	346891.22		
	Total	7239101.9	20			
TA100 (+S9)	Among Samples	7.581E+09	6	1.264E+09	10.412	< 0.001
	Within Samples	1.699E+09	14	121352199		
	Total	9.28E+09	20			
TA100 (-S9)	Among Samples	1.228E+09	6	204653044	2.256	0.098
	Within Samples	1.27E+09	14	90728705		
	Total	2.498E+09	20			
TA102 (+S9)	Among Samples	8.453E+09	6	1.409E+09	3.173	0.035
	Within Samples	6.217E+09	14	444049557		
	Total	1.467E+10	20			
TA102 (-S9)	Among Samples	2.581E+09	6	430086256	1.502	0.248
	Within Samples	4.009E+09	14	286322478		
	Total	6.589E+09	20			
TA1535 (+S9)	Among Samples	433557.23	6	72259.539	0.367	0.888
	Within Samples	2755876.1	14	196848.3		
	Total	3189433.4	20			
TA1535 (-S9)	Among Samples	14932664	6	2488777.3	2.811	0.052
	Within Samples	12393809	14	885272.09		
	Total	27326473	20			
TA1537 (+S9)	Among Samples	181771266	6	30295211	2.128	0.115
	Within Samples	199293928	14	14235281		
	Total	381065194	20			
TA1537 (-S9)	Among Samples	34344668	6	5724111.3	7.562	0.001
	Within Samples	10597061	14	756932.91		
	Total	44941728	20			

One-way ANOVA analysis indicates significant differences, at $\alpha = 0.05$, among mean 'Unit of Use' slope estimates for test samples assayed with strains TA98 (+S9), TA100 (+S9), TA102 (+S9) and TA1537 (-S9).

6.4.4 Contrasts of Interest

(b) (4)

6.4.4.1 Revertants/mg 'Extracted Smokeless Tobacco in DMSO' (Selected Strains)

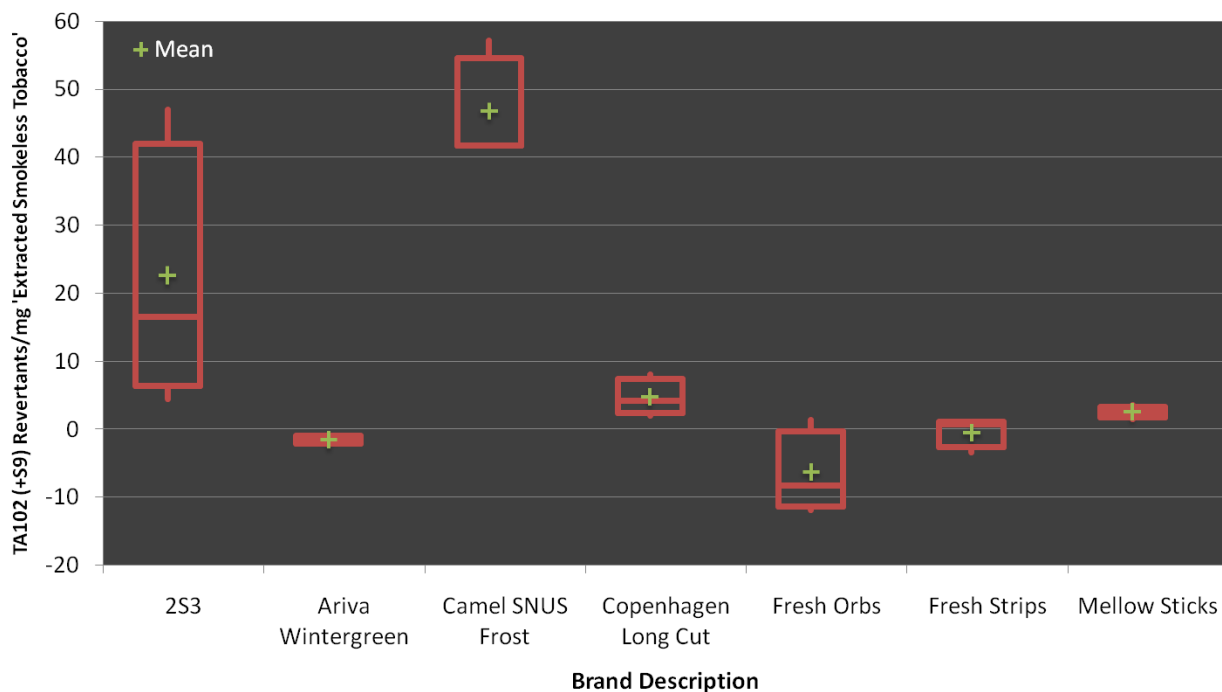
Sample Comparison	TA102 (+S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	9.8385	0.0073	not significant	2.3399	0.1484	not significant
084394 vs. 084454	37.627	0.0000	significant	13.714	0.0024	significant
084394 vs. 084455	32.883	0.0001	significant	16.822	0.0011	significant
084394 vs. 084456	29.727	0.0001	significant	14.325	0.0020	significant
084394 vs. 084457	39.333	0.0000	significant	15.227	0.0016	significant
084394 vs. 084458	47.373	0.0000	significant	10.700	0.0056	not significant
084395 vs. 084454	8.9845	0.0096	not significant	4.7245	0.0474	not significant
084395 vs. 084455	6.7481	0.0211	not significant	6.6144	0.0222	not significant
084395 vs. 084456	5.3622	0.0363	not significant	5.0858	0.0407	not significant
084395 vs. 084457	9.8282	0.0073	not significant	5.6288	0.0325	not significant
084395 vs. 084458	14.034	0.0022	significant	3.0323	0.1035	not significant
084454 vs. 084455	0.1598	0.6954	not significant	0.1586	0.6965	not significant
084454 vs. 084456	0.4648	0.5065	not significant	0.0067	0.9361	not significant
084454 vs. 084457	0.0189	0.8925	not significant	0.0396	0.8452	not significant
084454 vs. 084458	0.5606	0.4664	not significant	0.1868	0.6721	not significant
084455 vs. 084456	0.0796	0.7820	not significant	0.1003	0.7562	not significant
084455 vs. 084457	0.2887	0.5995	not significant	0.0397	0.8449	not significant
084455 vs. 084458	1.3189	0.2700	not significant	0.6897	0.4202	not significant
084456 vs. 084457	0.6713	0.4263	not significant	0.0138	0.9083	not significant
084456 vs. 084458	2.0463	0.1745	not significant	0.2640	0.6154	not significant
084457 vs. 084458	0.3735	0.5509	not significant	0.3984	0.5381	not significant

ANOVA-Based Homogenous Groupings: TA102 (+S9)

Sample ID	Client Description	Mean Slope	ANOVA-based Homogenous Groups
084458	Fresh Orbs	-6.31	X
084457	Ariva Wintergreen	-1.59	XX
084454	Fresh Strips	-0.53	XX
084455	Mellow Sticks	2.56	XX
084456	Copenhagen Long Cut	4.74	XX
084395	2S3	22.6	XX
084394	Camel SNUS Frost	46.8	X

ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean slope, for smokeless tobacco extracts expressed on a mg 'extracted smokeless tobacco in DMSO' basis, were detected in strain TA102 (+S9) between **Camel SNUS Frost (084394)** and each of **{Fresh Strips (084454), Mellow Sticks (084455), Copenhagen Long Cut (084456), Ariva Wintergreen (084457), Fresh Orbs (084458)}** and between **2S3 Research Moist Snuff (084395)** and **Fresh Orbs (084458)**.

Box-and-Whisker Plot: TA102 (+S9) Replicate Specific Activity Estimates

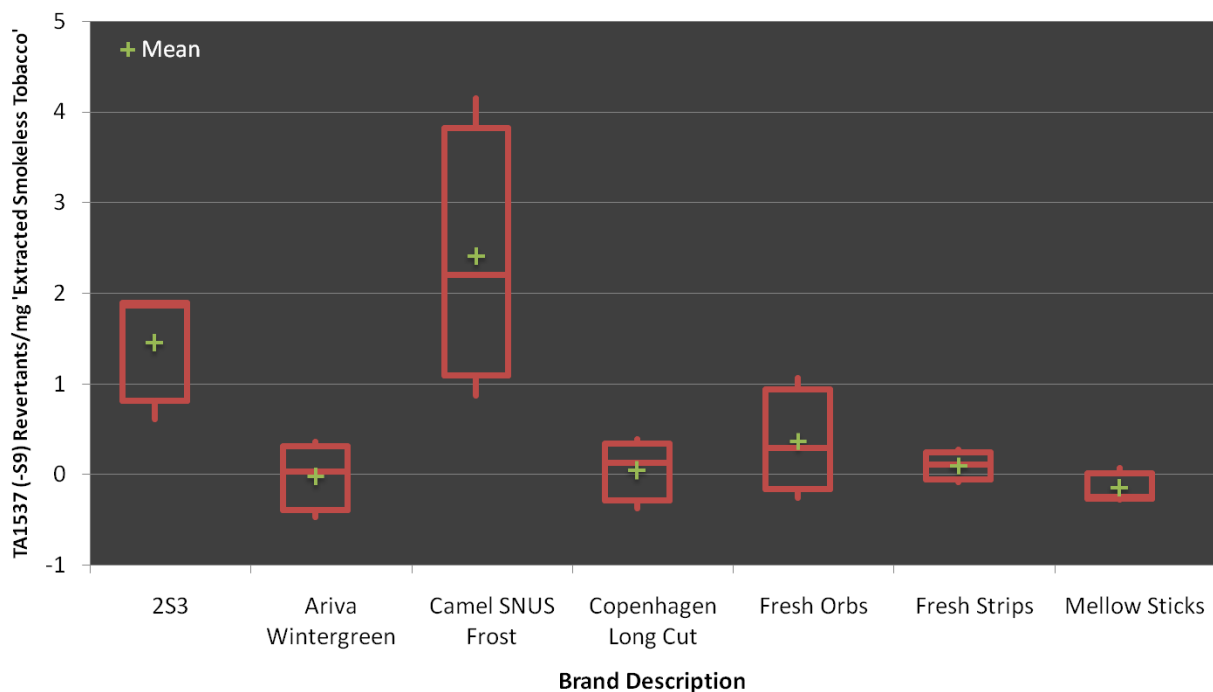


ANOVA-Based Homogenous Groupings: TA1537 (-S9)

Sample ID	Client Description	Mean Slope	ANOVA-based Homogenous Groups
084455	Mellow Sticks	-0.150	X
084457	Ariva Wintergreen	-0.026	X
084456	Copenhagen Long Cut	0.047	X
084454	Fresh Strips	0.098	X
084458	Fresh Orbs	0.368	XX
084395	2S3	1.45	XX
084394	Camel SNUS Frost	2.41	X

Significant differences in mean specific activity slope were also detected in strain TA1537 (-S9) between **Camel SNUS Frost (084394)** and each of {**Fresh Strips (084454)**, **Mellow Sticks (084455)**, **Copenhagen Long Cut (084456)**, **Ariva Wintergreen (084457)**}.

Box-and-Whisker Plot: TA1537 (-S9) Replicate Specific Activity Estimates



6.4.4.2 Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco' (Selected Strains)

Sample Comparison	TA98 (+S9)			TA102 (+S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	4.0925	0.0626	not significant	1.5446	0.2343	not significant	0.1419	0.7121	not significant
084394 vs. 084454	0.6556	0.4317	not significant	19.619	0.0006	significant	12.425	0.0034	not significant
084394 vs. 084455	0.0681	0.7980	not significant	17.783	0.0009	significant	14.469	0.0019	significant
084394 vs. 084456	8.9514	0.0097	not significant	13.779	0.0023	significant	12.457	0.0033	not significant
084394 vs. 084457	0.3324	0.5734	not significant	20.223	0.0005	significant	13.444	0.0025	not significant
084394 vs. 084458	0.2737	0.6090	not significant	23.204	0.0003	significant	10.490	0.0059	not significant
084395 vs. 084454	8.0241	0.0133	not significant	10.1537	0.0066	not significant	9.9113	0.0071	not significant
084395 vs. 084455	5.2162	0.0385	not significant	8.8453	0.0101	not significant	11.7455	0.0041	not significant
084395 vs. 084456	0.9388	0.3490	not significant	6.0971	0.0270	not significant	9.9402	0.0071	not significant
084395 vs. 084457	6.7574	0.0210	not significant	10.5895	0.0058	not significant	10.8234	0.0054	not significant
084395 vs. 084458	2.2495	0.1559	not significant	12.775	0.0031	not significant	8.1919	0.0125	not significant
084454 vs. 084455	0.3012	0.5918	not significant	0.0451	0.8349	not significant	0.0778	0.7844	not significant
084454 vs. 084456	14.4520	0.0019	significant	0.5145	0.4850	not significant	0.0000	0.9964	not significant
084454 vs. 084457	0.0544	0.8190	not significant	0.0046	0.9470	not significant	0.0201	0.8894	not significant
084454 vs. 084458	1.7765	0.2039	not significant	0.1503	0.7040	not significant	0.0818	0.7790	not significant
084455 vs. 084456	10.5806	0.0058	not significant	0.2549	0.6215	not significant	0.0753	0.7878	not significant
084455 vs. 084457	0.0996	0.7570	not significant	0.0784	0.7835	not significant	0.0188	0.8928	not significant

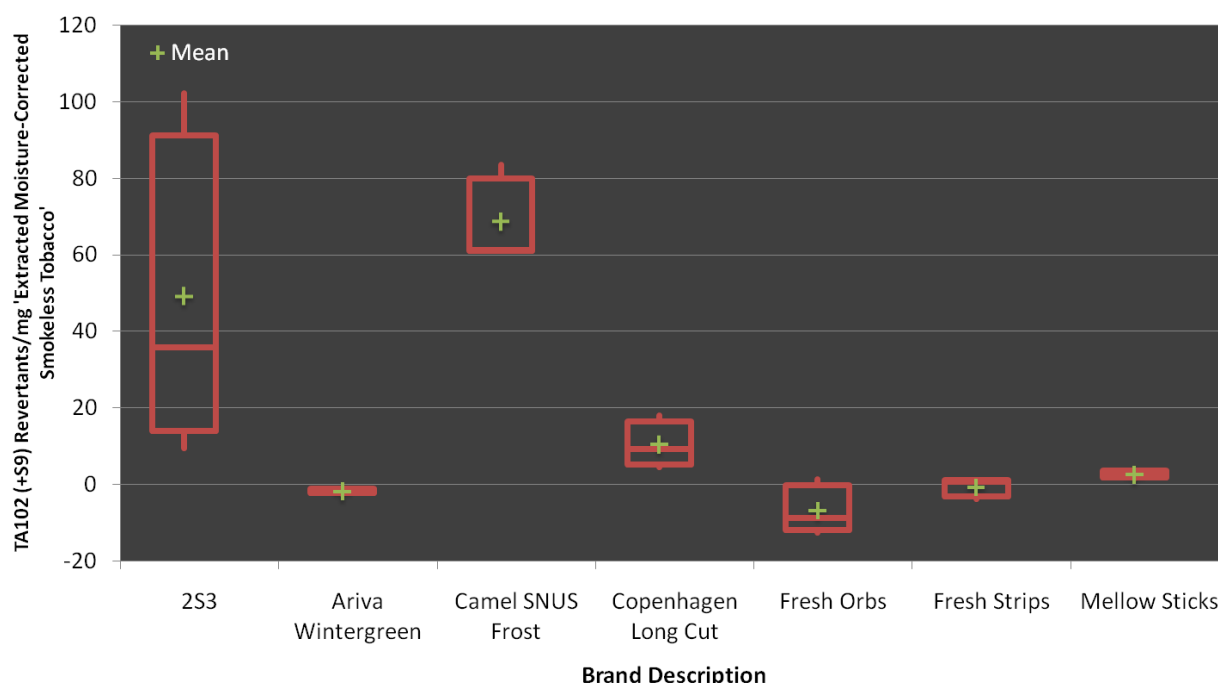
Sample Comparison	TA98 (+S9)			TA102 (+S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084455 vs. 084458	0.6148	0.4461	not significant	0.3601	0.5580	not significant	0.3192	0.5810	not significant
084456 vs. 084457	12.7334	0.0031	not significant	0.6161	0.4456	not significant	0.0188	0.8929	not significant
084456 vs. 084458	6.0946	0.0271	not significant	1.2210	0.2878	not significant	0.0845	0.7756	not significant
084457 vs. 084458	1.2093	0.2900	not significant	0.1025	0.7536	not significant	0.1830	0.6753	not significant

ANOVA-Based Homogenous Groupings: TA102 (+S9)

Sample ID	Client Description	Mean Slope	ANOVA-based Homogenous Groups
084458	Fresh Orbs	-6.65	X
084457	Ariva Wintergreen	-1.65	X
084454	Fresh Strips	-0.59	X
084455	Mellow Sticks	2.72	X
084456	Copenhagen Long Cut	10.6	X
084395	2S3	49.2	XX
084394	Camel SNUS Frost	68.6	X

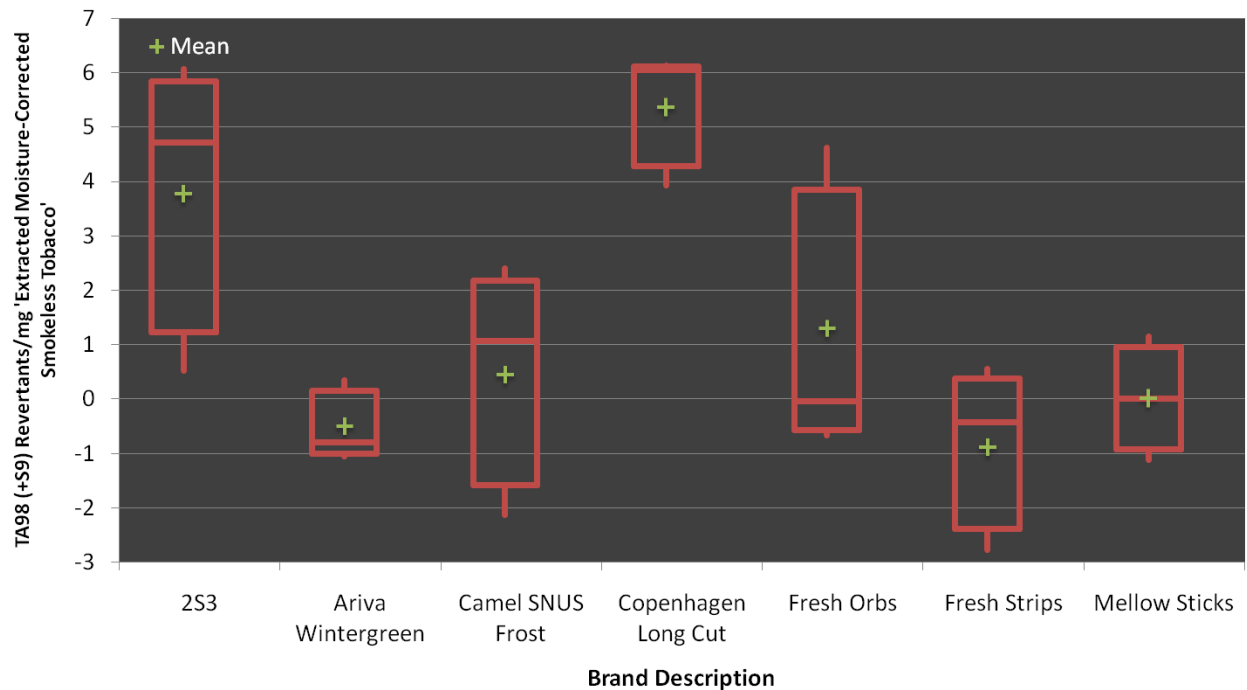
ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean slope, for smokeless tobacco extracts expressed on a mg 'extracted moisture-corrected smokeless tobacco in DMSO' basis, were detected in strain TA102 (+S9) between **Camel SNUS Frost (084394)** and each of {**Fresh Strips (084454)**, **Mellow Sticks (084455)**, **Copenhagen Long Cut (084456)**, **Ariva Wintergreen (084457)**, **Fresh Orbs (084458)**}.

Box-and-Whisker Plot: TA102 (+S9) Replicate Specific Activity Estimates

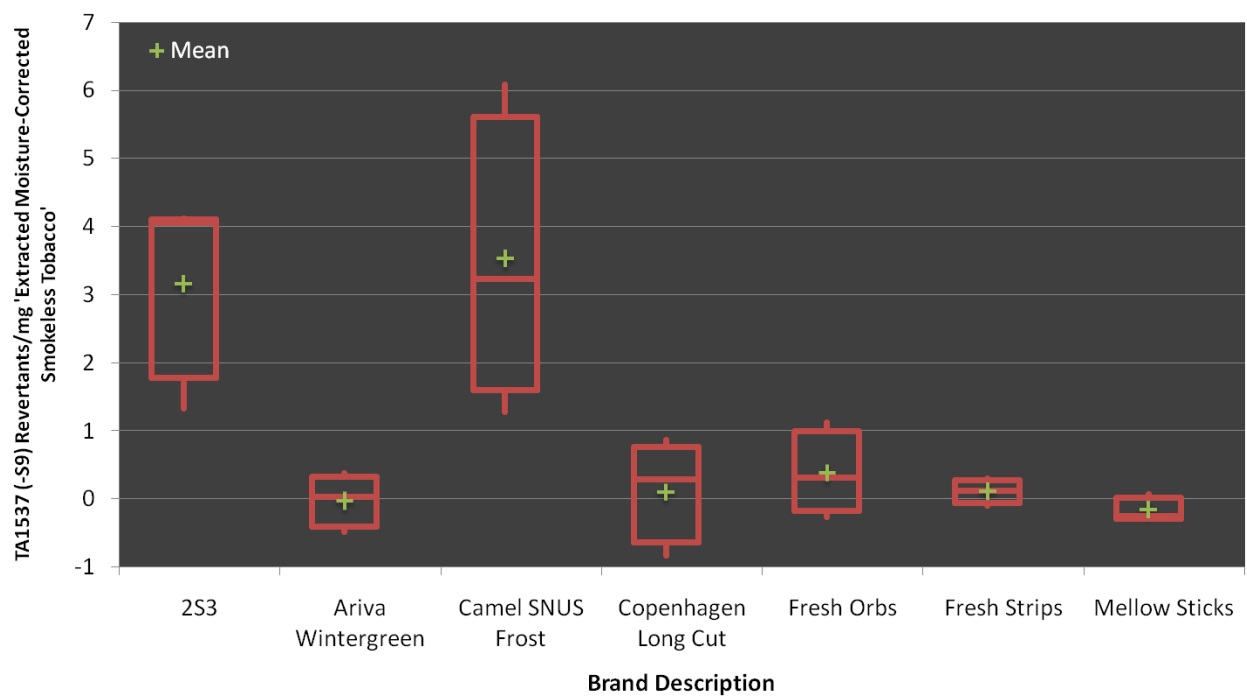


Significant differences in mean specific activity slope were also detected in strain TA98 (+S9) between **Fresh Strips (084454)** and **Copenhagen Long Cut (084456)** and in TA1537 (-S9) between **Camel SNUS Frost (084394)** and **Mellow Sticks (084455)**.

Box-and-Whisker Plot: TA98 (+S9) Replicate Specific Activity Estimates



Box-and-Whisker Plot: TA1537 (-S9) Replicate Specific Activity Estimates



6.4.4.3 Revertants/ μ g 'Extracted Nicotine in DMSO' (Selected Strains)

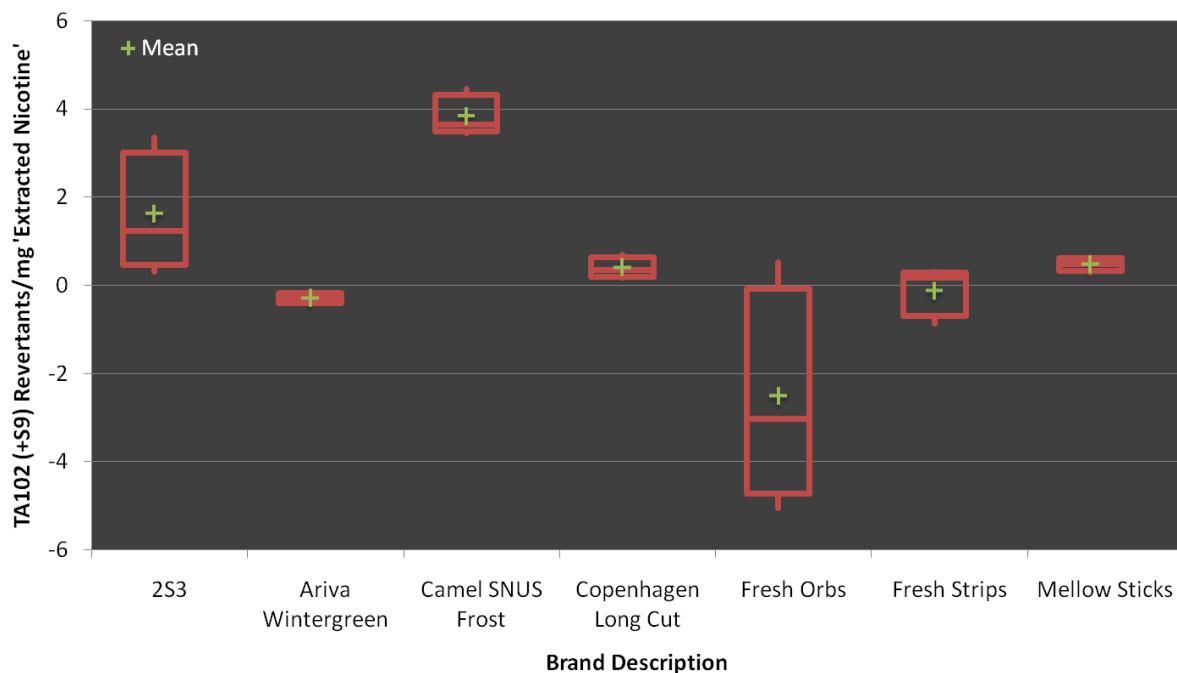
Sample Comparison	TA102 (+S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	4.5884	0.0503	not significant
084394 vs. 084454	14.784	0.0018	significant
084394 vs. 084455	10.673	0.0056	not significant
084394 vs. 084456	11.100	0.0049	not significant
084394 vs. 084457	16.005	0.0013	significant
084394 vs. 084458	37.961	0.0000	significant
084395 vs. 084454	2.9002	0.1107	not significant
084395 vs. 084455	1.2655	0.2795	not significant
084395 vs. 084456	1.4151	0.2540	not significant
084395 vs. 084457	3.4542	0.0842	not significant
084395 vs. 084458	16.154	0.0013	significant
084454 vs. 084455	0.3341	0.5724	not significant
084454 vs. 084456	0.2636	0.6157	not significant
084454 vs. 084457	0.0242	0.8786	not significant
084454 vs. 084458	5.3646	0.0362	not significant
084455 vs. 084456	0.0042	0.9494	not significant
084455 vs. 084457	0.5382	0.4753	not significant
084455 vs. 084458	8.3764	0.0118	not significant
084456 vs. 084457	0.4475	0.5144	not significant
084456 vs. 084458	8.0065	0.0134	not significant
084457 vs. 084458	4.6682	0.0485	not significant

ANOVA-Based Homogenous Groupings: TA102 (+S9)

Sample ID	Client Description	Mean Slope	ANOVA-based Homogenous Groups
084458	Fresh Orbs	-2.52	X
084457	Ariva Wintergreen	-0.29	XX
084454	Fresh Strips	-0.13	XX
084456	Copenhagen Long Cut	0.40	XXX
084455	Mellow Sticks	0.47	XXX
084395	2S3	1.63	XX
084394	Camel SNUS Frost	3.84	X

ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean slope, for smokeless tobacco extracts expressed on a μ g 'extracted nicotine in DMSO' basis, were detected in strain TA102 (+S9) between **Camel SNUS Frost (084394)** and each of {**Fresh Strips (084454)**, **Ariva Wintergreen (084457)**, **Fresh Orbs (084458)**} and between **2S3 Research Moist Snuff (084395)** and **Fresh Orbs (084458)**.

Box-and-Whisker Plot: TA102 (+S9) Replicate Specific Activity Estimates



6.4.4.4 Revertants / 'Unit of Use'

Sample Comparison	TA98 (+S9)			TA100 (+S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	12.36	0.0034	not significant	16.76	0.0011	significant	9.5018	0.0081	not significant
084394 vs. 084454	0.0563	0.8158	not significant	0.2940	0.5962	not significant	4.066	0.0634	not significant
084394 vs. 084455	0.0219	0.8846	not significant	0.0002	0.9887	not significant	4.591	0.0502	not significant
084394 vs. 084456	24.13	0.0002	significant	21.69	0.0004	significant	3.486	0.0830	not significant
084394 vs. 084457	0.0724	0.7919	not significant	0.0753	0.7877	not significant	4.177	0.0603	not significant
084394 vs. 084458	0.0067	0.9360	not significant	0.2813	0.6042	not significant	3.675	0.0759	not significant
084395 vs. 084454	14.08	0.0021	significant	21.49	0.0004	significant	26.00	0.0002	significant
084395 vs. 084455	13.4180	0.0026	not significant	16.64	0.0011	significant	27.30	0.0001	significant
084395 vs. 084456	1.9525	0.1841	not significant	0.3182	0.5816	not significant	24.50	0.0002	significant
084395 vs. 084457	14.32	0.0020	significant	19.08	0.0006	significant	26.28	0.0002	significant
084395 vs. 084458	11.79	0.0040	not significant	21.38	0.0004	significant	25.00	0.0002	significant
084454 vs. 084455	0.0080	0.9300	not significant	0.3099	0.5865	not significant	0.0160	0.9012	not significant
084454 vs. 084456	26.52	0.0001	significant	27.04	0.0001	significant	0.0223	0.8835	not significant
084454 vs. 084457	0.0010	0.9752	not significant	0.0717	0.7928	not significant	0.0008	0.9785	not significant
084454 vs. 084458	0.1018	0.7544	not significant	0.0001	0.9907	not significant	0.0098	0.9224	not significant
084455 vs. 084456	25.61	0.0002	significant	21.56	0.0004	significant	0.0760	0.7869	not significant
084455 vs. 084457	0.0147	0.9053	not significant	0.0835	0.7768	not significant	0.0098	0.9226	not significant
084455 vs. 084458	0.0527	0.8217	not significant	0.2968	0.5945	not significant	0.0509	0.8248	not significant
084456 vs. 084457	26.85	0.0001	significant	24.32	0.0002	significant	0.0312	0.8623	not significant

Report prepared by Labstat International ULC

Sample Comparison	TA98 (+S9)			TA100 (+S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084456 vs. 084458	23.34	0.0003	significant	26.91	0.0001	significant	0.0025	0.9608	not significant
084457 vs. 084458	0.1230	0.7310	not significant	0.0655	0.8018	not significant	0.0160	0.9010	not significant

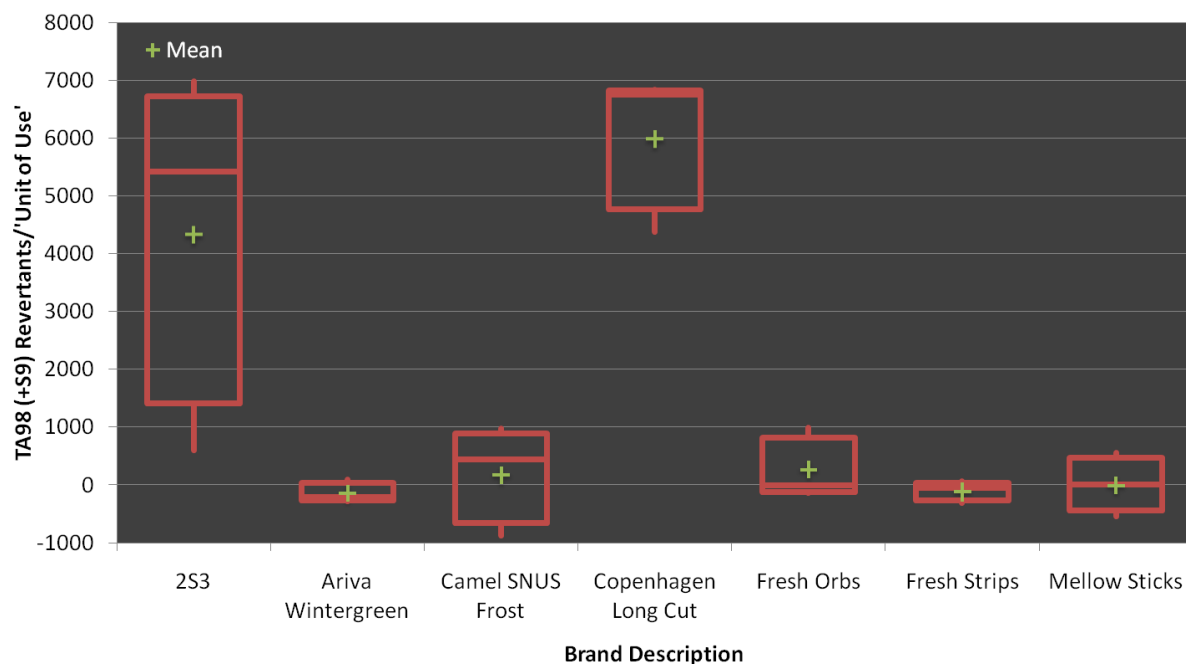
NOTE: while the p-value for TA102 (+S9) was significant, the subsequent ANOVA-based comparisons were unable to detect any significant differences in slope between individual test samples pairs.

ANOVA-Based Homogenous Groupings: TA98 (+S9)

Sample ID	Client Description	Mean Slope	ANOVA-based Homogenous Groups
084457	Ariva Wintergreen	-136	X
084454	Fresh Strips	-98.7	X
084455	Mellow Sticks	7.00	XX
084394	Camel SNUS Frost	182	XX
084458	Fresh Orbs	278	XX
084395	2S3	4335	XX
084456	Copenhagen Long Cut	5986	X

ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean slope, for smokeless tobacco extracts expressed per 'unit of use', were detected in strain TA98 (+S9) between **Copenhagen Long Cut (084456)** and each of {**Camel SNUS Frost (084394)**, **Fresh Strips (084454)**, **Mellow Sticks (084455)**, **Ariva Wintergreen (084457)**, **Fresh Orbs (084458)**} and between **2S3 Research Moist Snuff (084395)** and each of {**Fresh Strips (084454)**, **Ariva Wintergreen (084457)**}.

Box-and-Whisker Plot: TA98 (+S9) Replicate Specific Activity Estimates

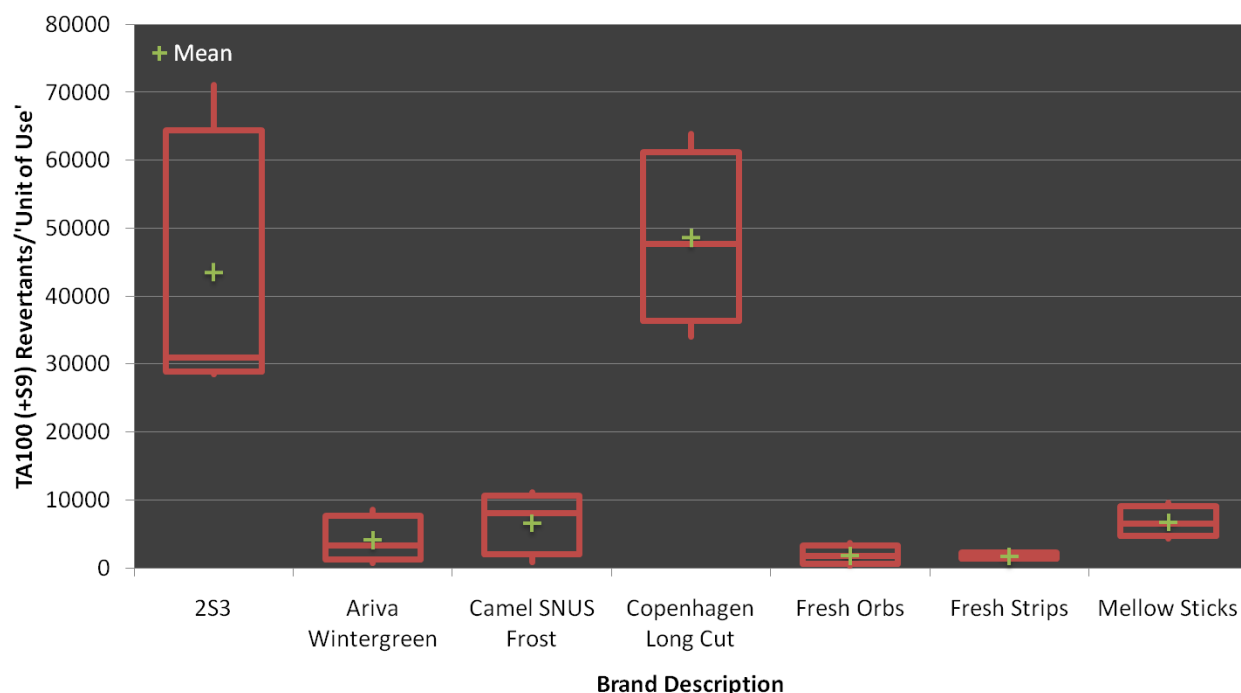


ANOVA-Based Homogenous Groupings: TA100 (+S9)

Sample ID	Client Description	Mean Slope	ANOVA-based Homogenous Groups
084454	Fresh Strips	1786	X
084458	Fresh Orbs	1893	X
084457	Ariva Wintergreen	4195	X
084394	Camel SNUS Frost	6663	X
084455	Mellow Sticks	6794	X
084395	2S3	43482	X
084456	Copenhagen Long Cut	48555	X

ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean slope, for smokeless tobacco extracts expressed per 'unit of use', were detected in strain TA100 (+S9) between each of **2S3 Research Moist Snuff (084395)** and **Copenhagen Long Cut (084456)** and the remaining test samples.

Box-and-Whisker Plot: TA100 (+S9) Replicate Specific Activity Estimates

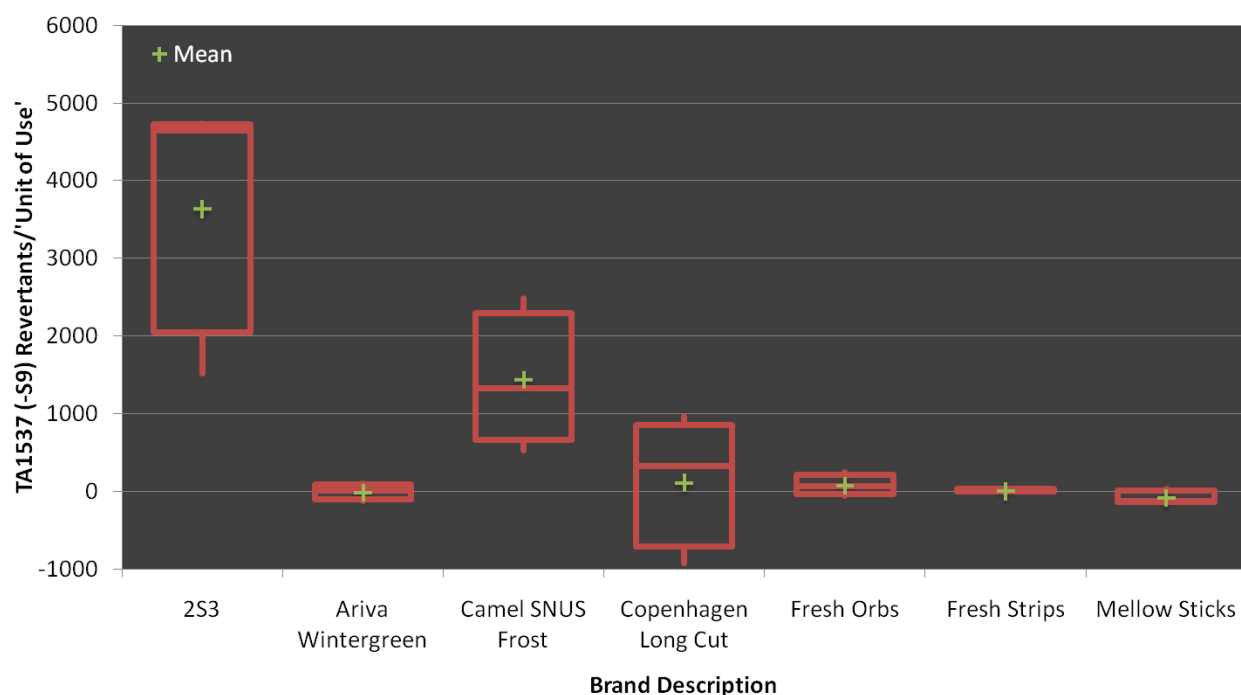


ANOVA-Based Homogenous Groupings: TA1537 (-S9)

Sample ID	Client Description	Mean Slope	ANOVA-based Homogenous Groups
084455	Mellow Sticks	-77.5	X
084457	Ariva Wintergreen	-7.2	X
084454	Fresh Strips	12.3	X
084458	Fresh Orbs	82.7	X
084456	Copenhagen Long Cut	118	X
084394	Camel SNUS Frost	1445	XX
084395	2S3	3634	X

ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean slope, for smokeless tobacco extracts expressed per 'unit of use', were detected in strain TA1537 (-S9) between **2S3 Research Moist Snuff (084395)** and all of the other test samples except for Camel SNUS Frost (084394).

Box-and-Whisker Plot: TA1537 (-S9) Replicate Specific Activity Estimates



6.5 Comparisons Between Smoked and Smokeless Tobacco Products

6.5.1 Replicate Specific Activity Slopes and Slope Statistics

Tables of results were obtained for the individual replicate slope estimates and the summary statistics over the three replicate slopes for each smoked and smokeless tobacco test sample under each tester strain and S9 activation. The file *M97_ames_tpm+wt_stats_Nicotine.xls* gives tables of results for all the smokeless tobacco samples plus the tobacco smoke CSC of the KR 2R4F (084396) samples on an 'extracted nicotine in DMSO' and 'Nicotine in CSC' dose basis, respectively. The file *M97_ames_tpm+wt_stats_Unit.xls* gives tables of results for all the smokeless tobacco samples plus the

Report prepared by Labstat International ULC

tobacco smoke CSC of the KR 2R4F (084396) samples on a 'unit of use' dose basis (see table in section 5.1.1 for defined units).

6.5.2 Data Plots

Plots of all replicate smokeless and smoked tobacco test samples can be found in the files *M97_ames_tpm+wt_stats_Nicotine.xls* and *M97_ames_tpm+wt_stats_Unit.xls* on the CD that accompanies this report. Box-and-Whisker plots of the calculated specific activities can also be found on the CD that accompanies this report.

6.5.3 One-Way ANOVA Results

6.5.3.1 Revertants/ μ g 'Nicotine'

One-way ANOVA comparisons of mean 'extracted nicotine' and 'nicotine in CSC' slope estimates among all 7 smokeless and one smoked test samples yielded the following:

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
TA98 (+S9)	Among Samples	1782.608	7	254.658	39.5	< 0.001
	Within Samples	103.027	16	6.439		
	Total	1885.635	23			
TA98 (-S9)	Among Samples	2.061	7	0.294	13.6	< 0.001
	Within Samples	0.346	16	0.022		
	Total	2.407	23			
TA100 (+S9)	Among Samples	173.108	7	24.730	9.51	< 0.001
	Within Samples	41.623	16	2.601		
	Total	214.732	23			
TA100 (-S9)	Among Samples	47.826	7	6.832	4.17	0.009
	Within Samples	26.190	16	1.637		
	Total	74.017	23			
TA102 (+S9)	Among Samples	67.986	7	9.712	6.44	0.001
	Within Samples	24.138	16	1.509		
	Total	92.124	23			
TA102 (-S9)	Among Samples	69.346	7	9.907	1.07	0.425
	Within Samples	147.952	16	9.247		
	Total	217.298	23			
TA1535 (+S9)	Among Samples	0.058	7	0.008	0.461	0.848
	Within Samples	0.289	16	0.018		
	Total	0.348	23			
TA1535 (-S9)	Among Samples	1.937	7	0.277	2.40	0.069
	Within Samples	1.841	16	0.115		
	Total	3.778	23			
TA1537 (+S9)	Among Samples	45.059	7	6.437	167	< 0.001
	Within Samples	0.618	16	0.039		
	Total	45.677	23			
TA1537 (-S9)	Among Samples	0.310	7	0.044	2.49	0.062
	Within Samples	0.284	16	0.018		
	Total	0.595	23			

One-way ANOVA analysis indicates significant differences, at $\alpha = 0.05$, among mean 'Nicotine' slope estimates for smoked and smokeless tobacco samples assayed with strains TA98(+S9), TA98(-S9), TA100(+S9), TA100(-S9), TA102(+S9) and TA1537(+S9).

6.5.3.2 Revertants / 'Unit of Use'

One-way ANOVA comparisons of mean 'unit of use' slope estimates among all 7 smokeless and one smoked test samples yielded the following:

Tester Strain & S9 Activation	Variation Source	Sum of Squares	d.f.	Mean Square	F Ratio	P value
TA98 (+S9)	Among Samples	1.15E+09	7	164236019	26.0	< 0.001
	Within Samples	100919640	16	6307477.5		
	Total	1.251E+09	23			
TA98 (-S9)	Among Samples	3177507.3	7	453929.61	1.5	0.252
	Within Samples	4989783.2	16	311861.45		
	Total	8167290.4	23			
TA100 (+S9)	Among Samples	7.753E+09	7	1.108E+09	10.40	< 0.001
	Within Samples	1.704E+09	16	106495298		
	Total	9.457E+09	23			
TA100 (-S9)	Among Samples	1.238E+09	7	176815919	2.22	0.088
	Within Samples	1.272E+09	16	79505680		
	Total	2.51E+09	23			
TA102 (+S9)	Among Samples	8.899E+09	7	1.271E+09	3.27	0.024
	Within Samples	6.218E+09	16	388619210		
	Total	1.512E+10	23			
TA102 (-S9)	Among Samples	2.682E+09	7	383200269	1.53	0.228
	Within Samples	4.012E+09	16	250761897		
	Total	6.695E+09	23			
TA1535 (+S9)	Among Samples	433925.52	7	61989.36	0.359	0.913
	Within Samples	2759764.8	16	172485.3		
	Total	3193690.3	23			
TA1535 (-S9)	Among Samples	15819651	7	2259950.2	2.92	0.036
	Within Samples	12398058	16	774878.65		
	Total	28217710	23			
TA1537 (+S9)	Among Samples	187495082	7	26785012	2	0.097
	Within Samples	199498105	16	12468632		
	Total	386993187	23			
TA1537 (-S9)	Among Samples	34956603	7	4993800.4	7.51	< 0.001
	Within Samples	10645728	16	665357.99		
	Total	45602331	23			

One-way ANOVA analysis indicates significant differences, at $\alpha = 0.05$, among mean 'Nicotine' slope estimates for smoked and smokeless tobacco samples assayed with strains TA98(+S9), TA100(+S9), TA102(+S9), TA1535(-S9) and TA1537(-S9).

6.5.4 Contrasts of Interest

Seven contrasts were requested for comparing the mean specific activity of each of the 7 smokeless tobacco test samples with that of the smoked tobacco test sample, KR 2R4F. The tables below show ANOVA-based comparisons for only those strains where at least one comparison was significant. All other comparison results can be found in the statistical analysis data file on the CD that accompanies this report.

6.5.4.1 Revertants/ μ g 'Nicotine'

Sample Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	159	1.0E-09	significant	46.8	4.0E-06	significant	9.26	0.008	not significant
084395 vs. 084396	157	1.1E-09	significant	43.3	6.3E-06	significant	0.704	0.414	not significant
084454 vs. 084396	161	8.9E-10	significant	21.7	2.6E-04	significant	0.836	0.374	not significant
084455 vs. 084396	159	1.0E-09	significant	32.1	3.5E-05	significant	0.102	0.754	not significant
084456 vs. 084396	157	1.1E-09	significant	39.5	1.1E-05	significant	0.149	0.705	not significant
084457 vs. 084396	160	9.5E-10	significant	29.4	5.6E-05	significant	1.15	0.299	not significant
084458 vs. 084396	154	1.3E-09	significant	26.4	9.9E-05	significant	10.9	0.005	significant

Sample Comparison	TA1537 (+S9)			TA98 (-S9)			TA100 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	648	2.3E-14	significant	58.4	1.0E-06	significant	8.21	0.011	not significant
084395 vs. 084396	623	3.1E-14	significant	62.1	6.7E-07	significant	8.42	0.010	not significant
084454 vs. 084396	703	1.2E-14	significant	42.9	6.7E-06	significant	10.7	0.005	significant
084455 vs. 084396	689	1.4E-14	significant	35.1	2.1E-05	significant	9.21	0.008	not significant
084456 vs. 084396	649	2.2E-14	significant	57.8	1.1E-06	significant	6.53	0.021	not significant
084457 vs. 084396	698	1.3E-14	significant	49.3	2.9E-06	significant	17.1	0.001	significant
084458 vs. 084396	641	2.5E-14	significant	55.0	1.5E-06	significant	25.1	1.3E-04	significant

Sample Comparison	TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	1.08	0.314	not significant
084395 vs. 084396	3.85	0.067	not significant
084454 vs. 084396	7.22	0.016	not significant
084455 vs. 084396	10.0	0.006	significant
084456 vs. 084396	8.27	0.011	not significant
084457 vs. 084396	8.76	0.009	not significant
084458 vs. 084396	2.15	0.161	not significant

ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean specific activity slope were detected between smokeless tobacco extracts and the cigarette smoke condensate of KR 2R4F (084396) on a 'Nicotine' dose basis in the following instances:

Strains **TA98(+S9)**, **TA98 (-S9)**, **TA100(+S9)**, **TA1537 (+S9)**

- KR 2R4F (084396) specific activity (revertants/ μ g 'Nicotine in CSC') is significantly different from each of the 7 smokeless tobacco test samples (revertants/ μ g 'Extracted Nicotine in DMSO')

Strain **TA102(+S9)**

- KR 2R4F (084396) specific activity is significantly different from that of Fresh Orbs (084458)

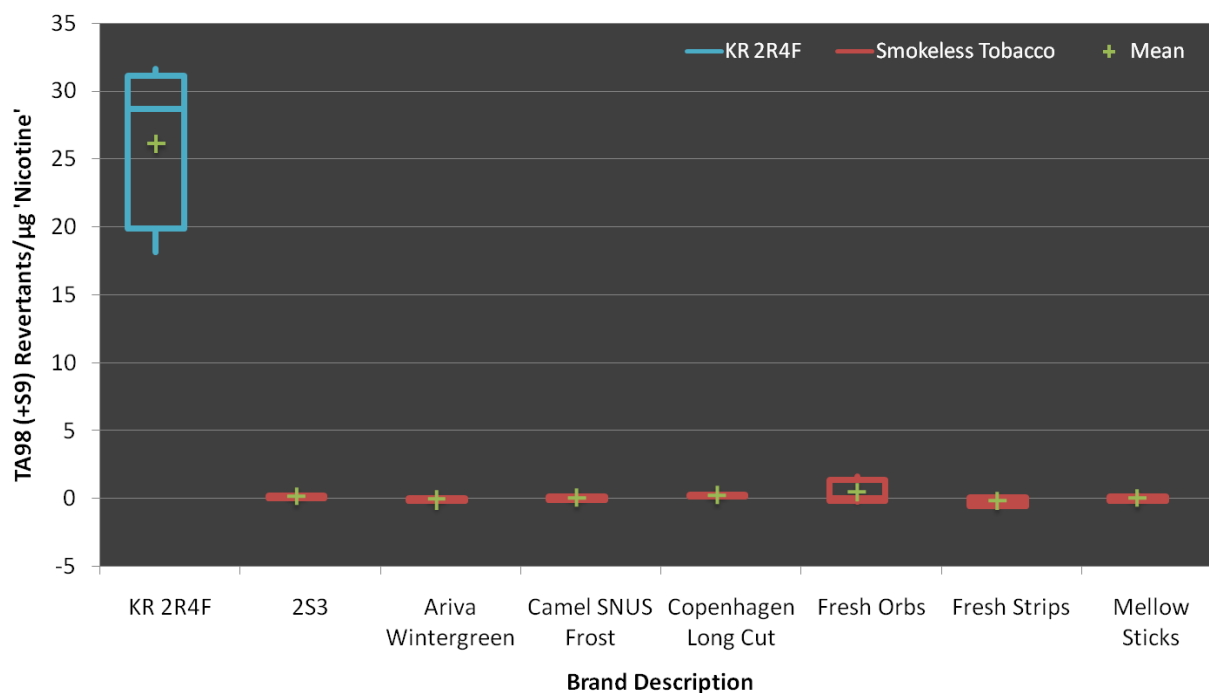
Strain **TA100(-S9)**

- KR 2R4F (084396) specific activity is significantly different from each of {Fresh Strips (084454), Ariva Wintergreen (084457), Fresh Orbs (084458)}

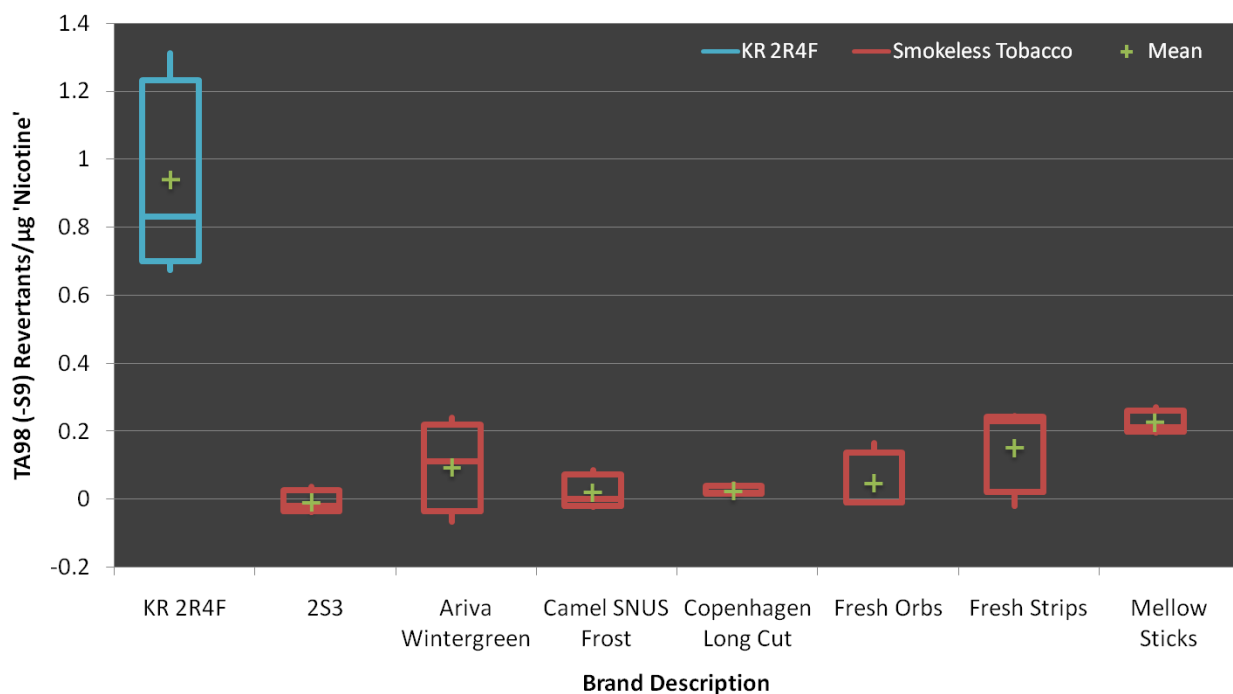
Strain **TA1537(-S9)**

- KR 2R4F (084396) specific activity is significantly different from that of Mellow Sticks (084455)

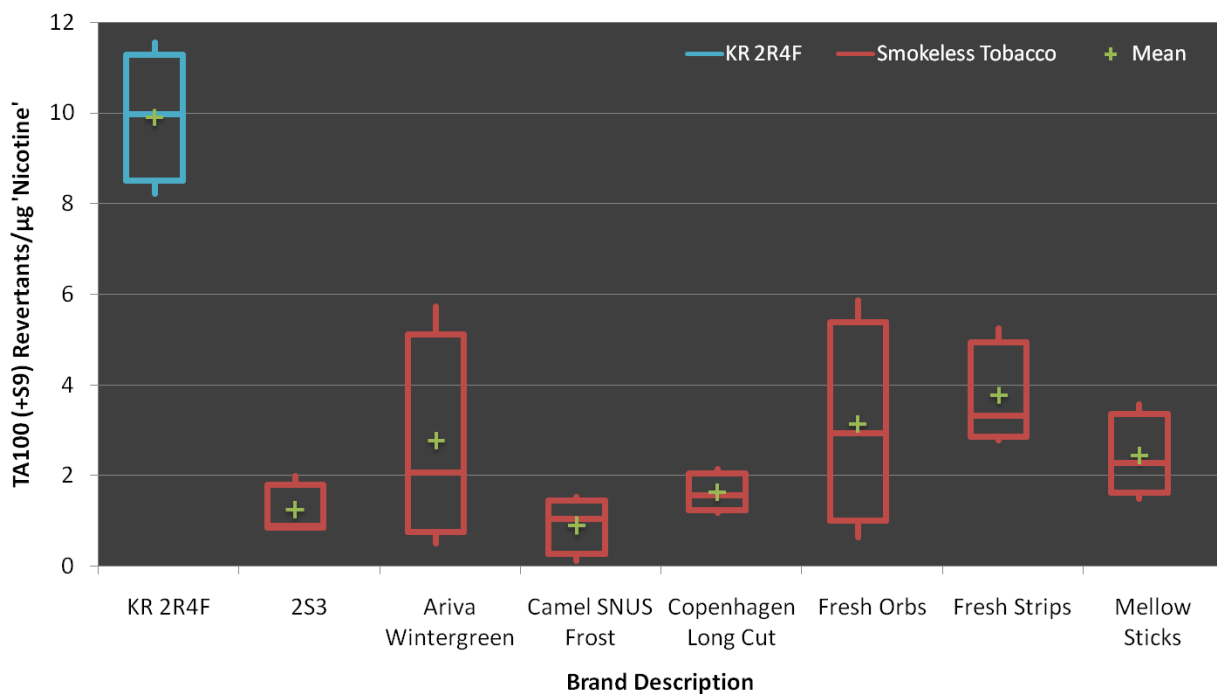
Box-and-Whisker Plot: TA98 (+S9) Replicate Specific Activity Estimates



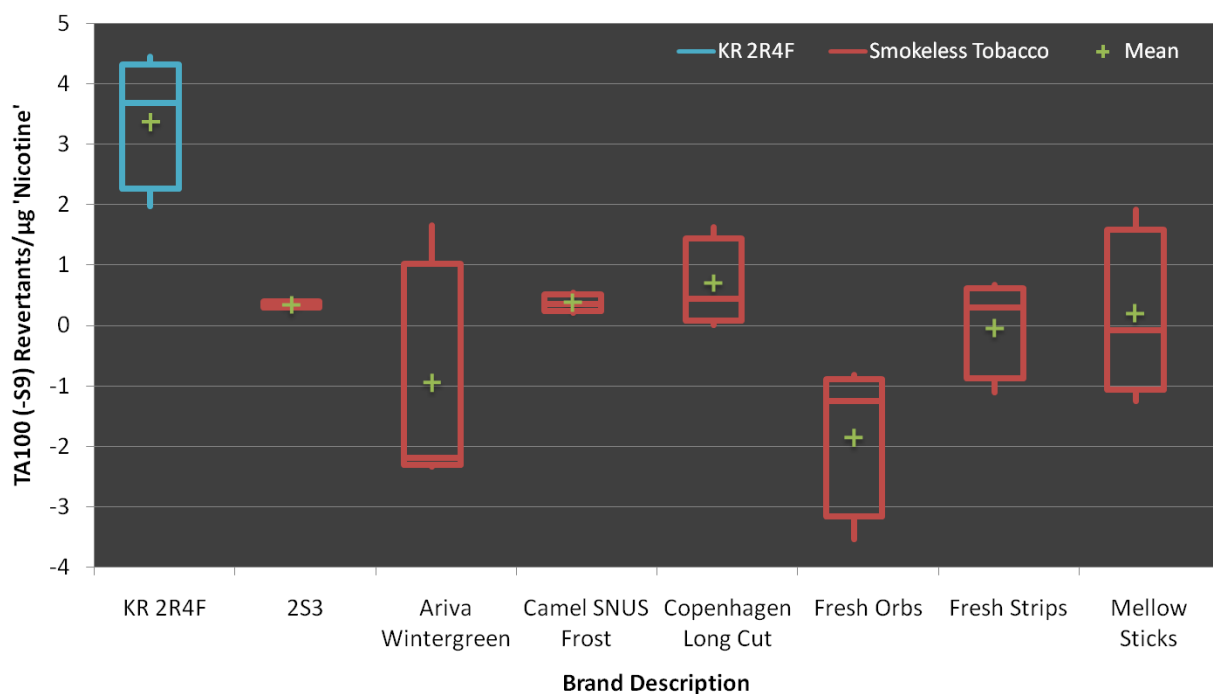
Box-and-Whisker Plot: TA98 (-S9) Replicate Specific Activity Estimates



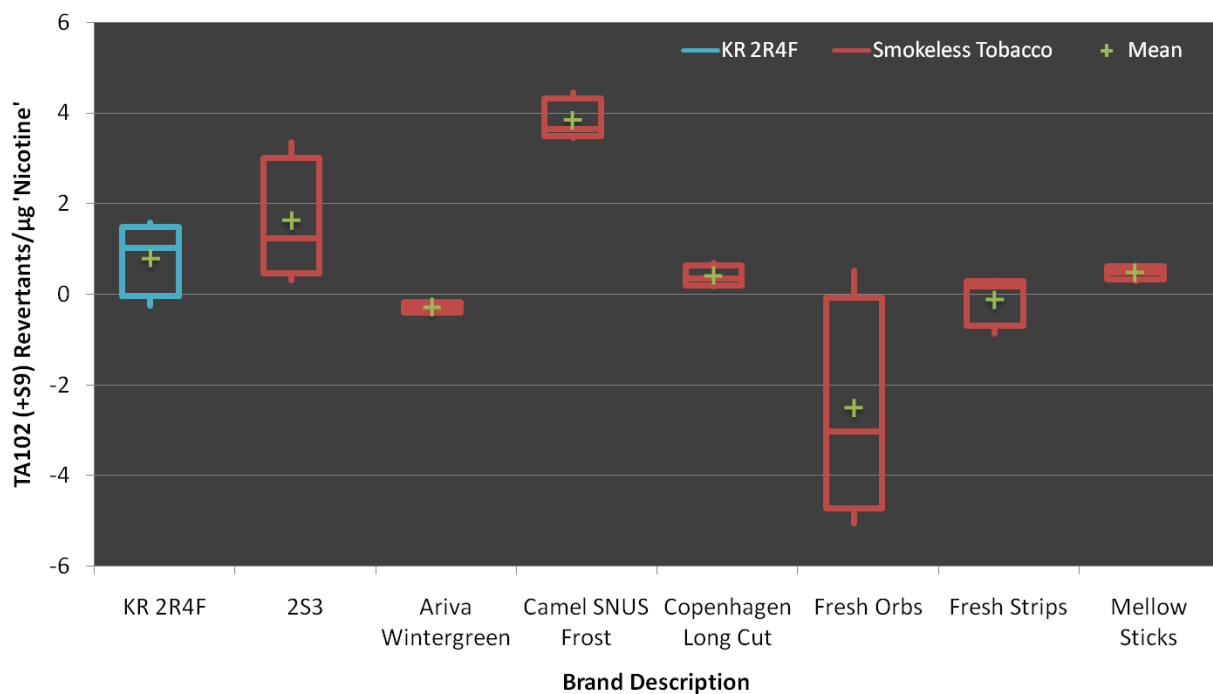
Box-and-Whisker Plot: TA100 (+S9) Replicate Specific Activity Estimates



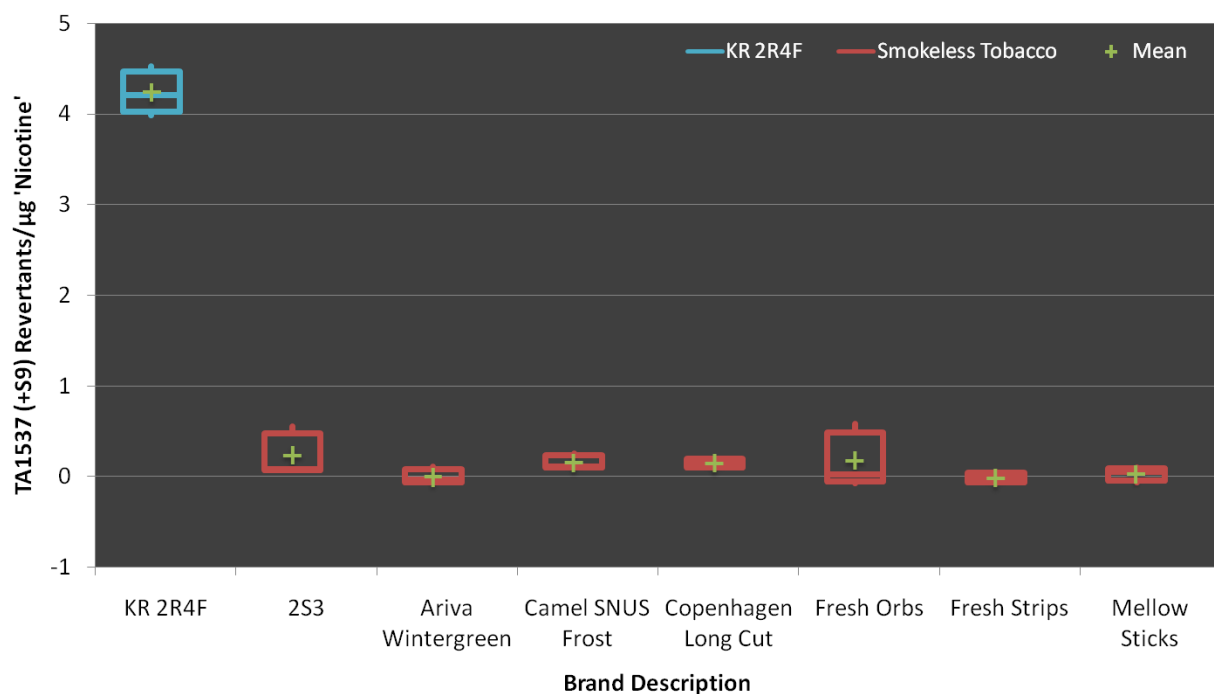
Box-and-Whisker Plot: TA100 (-S9) Replicate Specific Activity Estimates



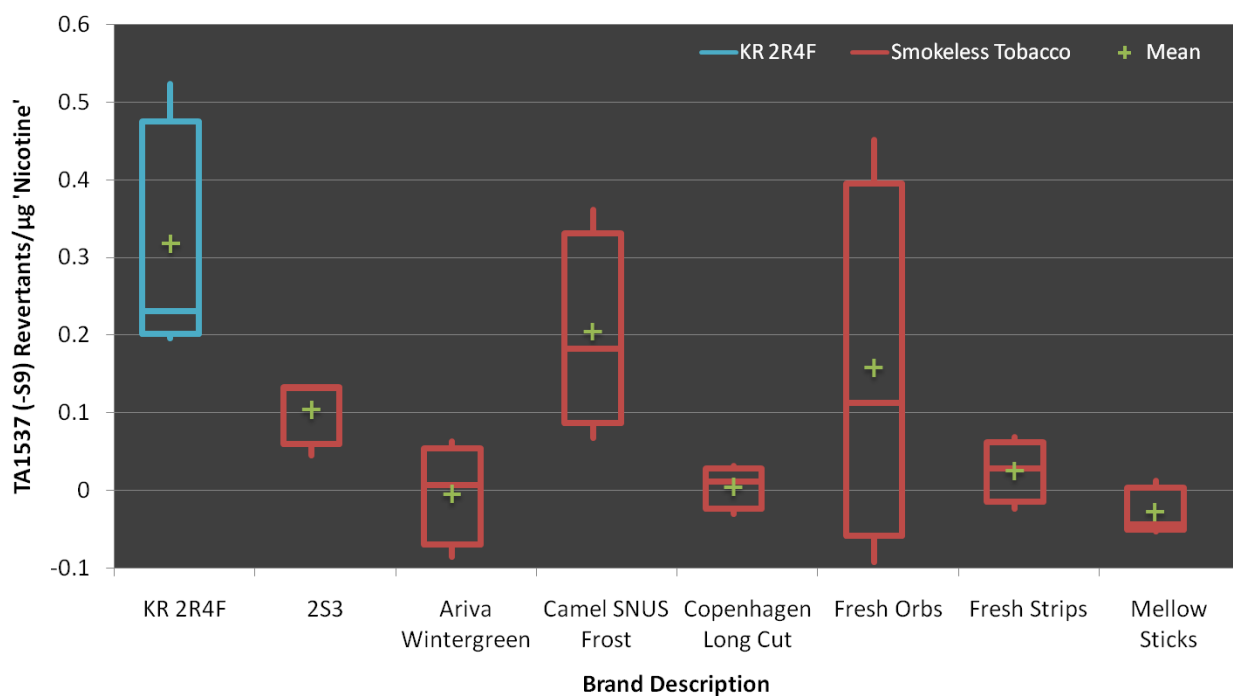
Box-and-Whisker Plot: TA102 (+S9) Replicate Specific Activity Estimates



Box-and-Whisker Plot: TA1537 (+S9) Replicate Specific Activity Estimates



Box-and-Whisker Plot: TA1537 (-S9) Replicate Specific Activity Estimates



6.5.4.2 Revertants / 'Unit of Use'

Sample Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	106.5	1.8E-08	significant	0.029	8.7E-01	not significant	2.9080	0.1075	not significant
084395 vs. 084396	68.8	3.5E-07	significant	17.63	6.8E-04	significant	12.06	0.0031	significant
084454 vs. 084396	109.4	1.5E-08	significant	0.562	4.6E-01	not significant	0.0020	0.9649	not significant
084455 vs. 084396	108.3	1.6E-08	significant	0.024	8.8E-01	not significant	0.0017	0.9675	not significant
084456 vs. 084396	56.1	1.3E-06	significant	23.05	2.0E-04	significant	0.4829	0.4971	not significant
084457 vs. 084396	109.7	1.4E-08	significant	0.215	6.5E-01	not significant	0.0047	0.9464	not significant
084458 vs. 084396	105.6	1.9E-08	significant	0.543	4.7E-01	not significant	0.017	0.8991	not significant

Sample Comparison	TA1535 (-S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	0.005	0.9469	not significant	3.158	0.0946	not significant
084395 vs. 084396	1.098	0.3102	not significant	25.65	0.0001	significant
084454 vs. 084396	0.018	0.8937	not significant	0.140	0.7136	not significant
084455 vs. 084396	0.063	0.8050	not significant	0.258	0.6181	not significant
084456 vs. 084396	12.37	0.0029	significant	0.046	0.8329	not significant
084457 vs. 084396	0.280	0.6043	not significant	0.162	0.6923	not significant
084458 vs. 084396	0.378	0.5472	not significant	0.072	0.7923	not significant

ANOVA-based comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean specific activity slope were detected between smokeless tobacco extracts and the cigarette smoke condensate of KR 2R4F (084396) on a 'Unit of Use' dose basis in the following instances:

Strain TA98(+S9)

- KR 2R4F (084396) specific activity (revertants/cigarette) is significantly different from each of the 7 smokeless tobacco test samples (revertants/'Unit of Use')

Strain TA100(+S9)

- KR 2R4F (084396) specific activity is significantly different from each of { 2S3 (084395), Copenhagen Long Cut (084456) }

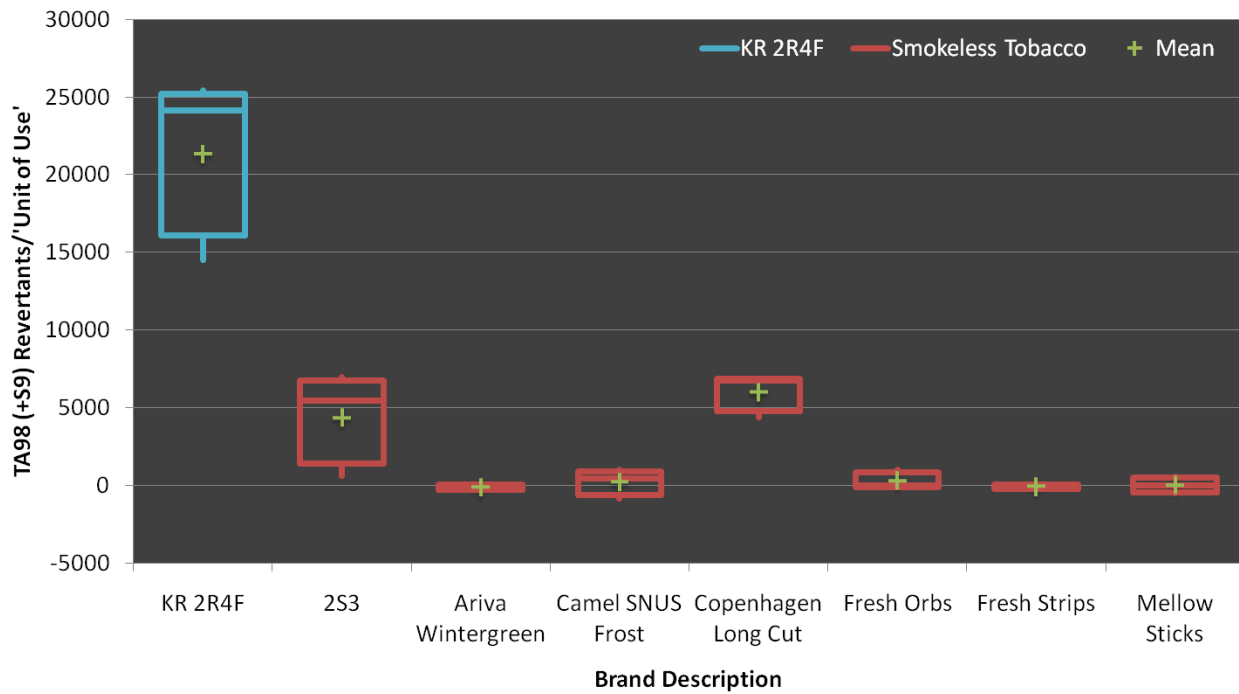
Strains TA102(+S9), TA1537 (-S9)

- KR 2R4F (084396) specific activity is significantly different from 2S3 (084395)

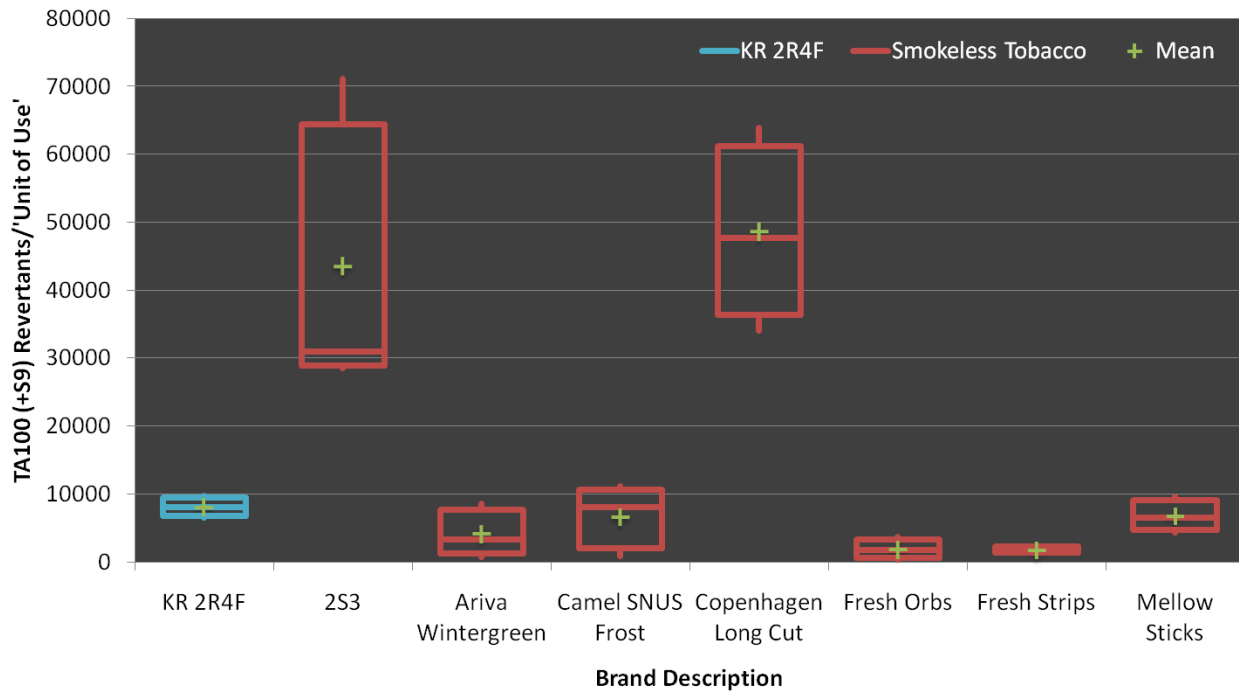
Strain TA1535(-S9)

- KR 2R4F (084396) specific activity is significantly different from Copenhagen Long Cut (084456)

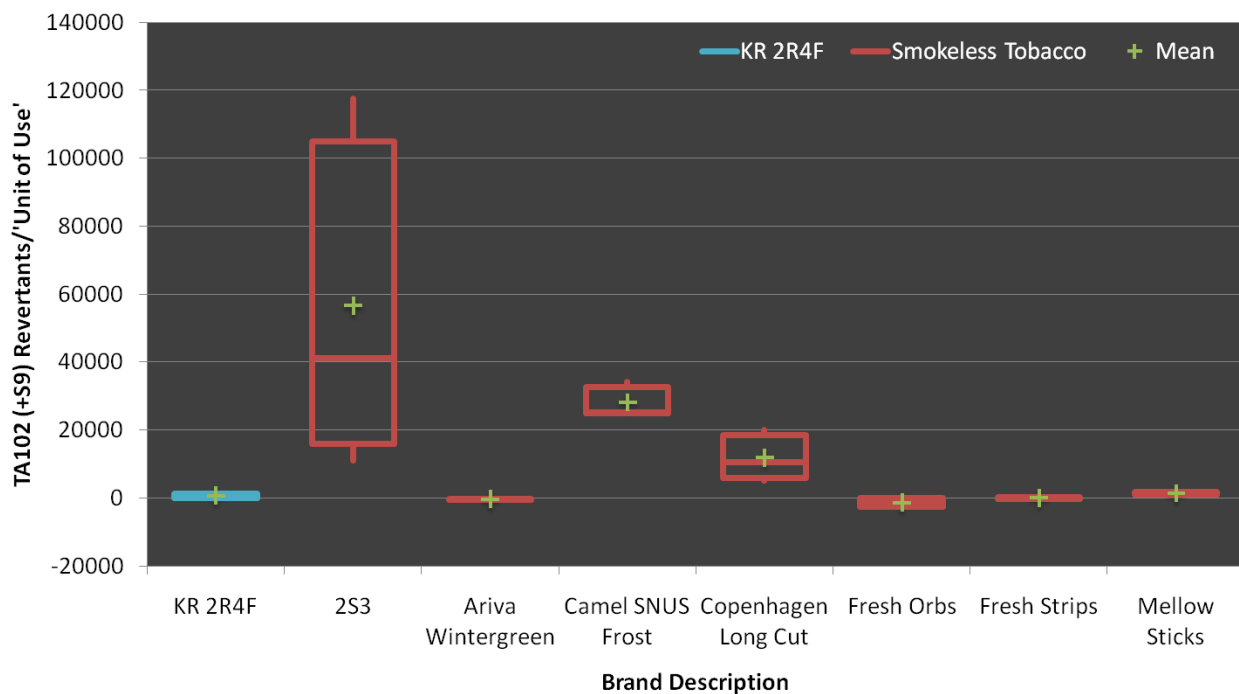
Box-and-Whisker Plot: TA98 (+S9) Replicate Specific Activity Estimates



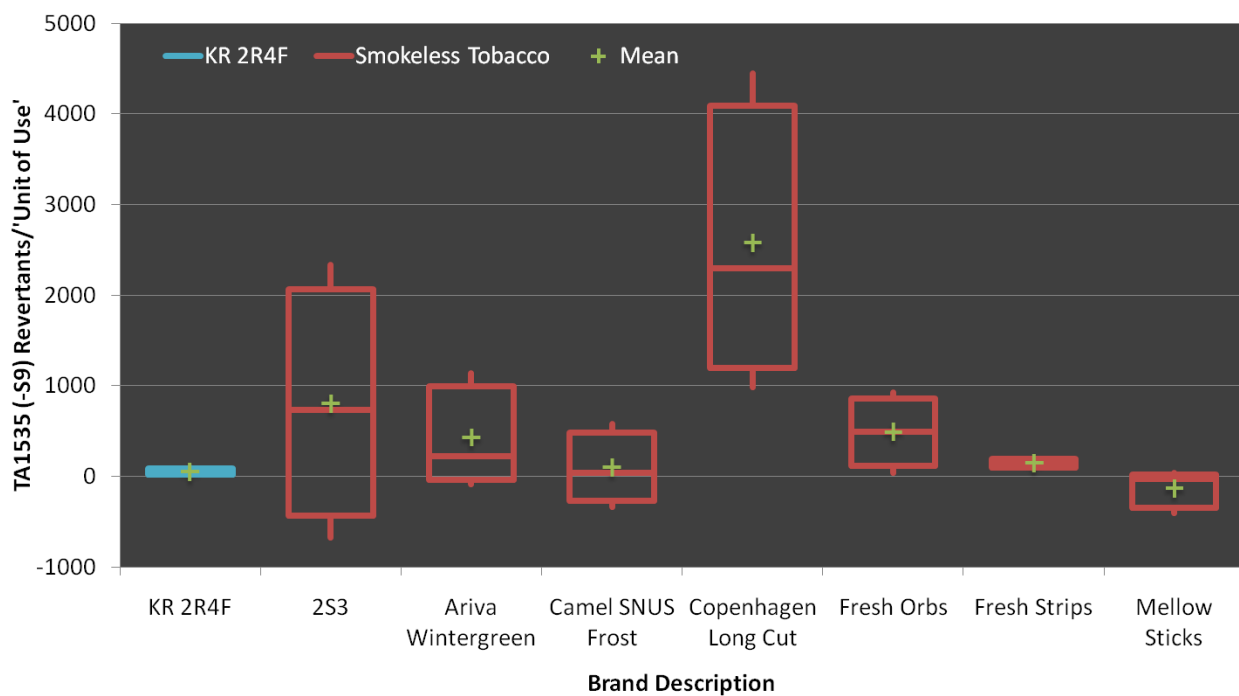
Box-and-Whisker Plot: TA100 (+S9) Replicate Specific Activity Estimates



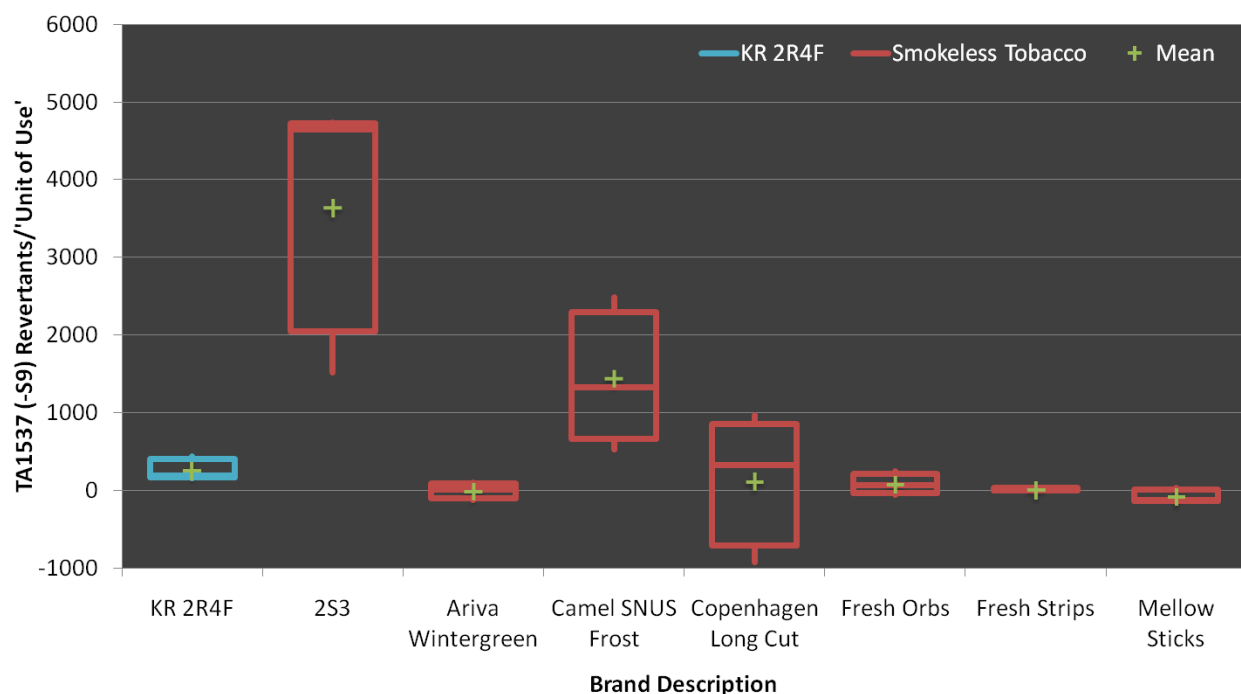
Box-and-Whisker Plot: TA102 (+S9) Replicate Specific Activity Estimates



Box-and-Whisker Plot: TA1535 (-S9) Replicate Specific Activity Estimates



Box-and-Whisker Plot: TA1537 (-S9) Replicate Specific Activity Estimates



7 Summary

Based on the results obtained in this study and the corresponding analysis of the toxicological data, the following summarizes the findings in regards to mutagenicity as measured with the *in vitro* Ames Bacterial Reverse Mutation assay.

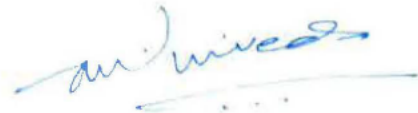
- Camel SNUS Frost (084394), 2S3 Research Moist Snuff (084395) and Copenhagen Long Cut (084456) appear to be the most mutagenic across each strain and dose basis tested where differences were found to be significant.
- In strains TA98 (+S9), TA98 (-S9), TA100 (+S9) and TA1537 (+S9), the CSC of KR 2R4F test samples on a nicotine dose basis was significantly more mutagenic than the extracts of any of the smokeless tobacco test samples on a nicotine dose basis. However, on a 'Unit of Use' basis, only strain TA98 (+S9) indicated that the KR 2R4F test samples were more mutagenic than the smokeless tobacco test samples.
- In general, the responses for all smokeless tobacco test brands were fairly weak, indicating low levels of mutagenic activity for these extracts as compared to the same tests using tobacco smoke condensate.

8 Attribution

8.1 Original

This report has been reviewed by me and is certified, to the best of my knowledge, to be a true and accurate description of the procedures, protocols and test methods used to arrive at the data and/or findings that accompany this report.

Dated: October 9, 2008



Amit Trivedi, Ph.D.,
Technical Director (Toxicology)
Labstat International ULC

8.2 Revision 1

This report has been reviewed by me and is certified, to the best of my knowledge, to be a true and accurate description of the procedures, protocols and test methods used to arrive at the data and/or findings that accompany this report.

Dated: October 17, 2008




Amit Trivedi, Ph.D.,
Technical Director (Toxicology)
Labstat International ULC

8.3 Revision 2

This report has been reviewed by me and is certified, to the best of my knowledge, to be a true and accurate description of the statistical analysis methodologies used to arrive at the findings that accompany this report.

Dated: October 26, 2009



Wendy Wagstaff
Senior Statistician
Labstat International ULC

8.4 Revision 3

8.4.1 Technical Director (Toxicology)

This report has been reviewed by me and is certified, to the best of my knowledge, to be a true and accurate description of the procedures, protocols and test methods used to arrive at the data and/or findings that accompany this report.

Dated: December 15, 2009



Amit Trivedi, Ph.D.,
Technical Director (Toxicology)
Labstat International ULC

8.4.2 Senior Statistician

This report has been reviewed by me and is certified, to the best of my knowledge, to be a true and accurate description of the statistical analysis methodologies used to arrive at the findings that accompany this report.

Dated: December 15, 2009



Wendy Wagstaff
Senior Statistician
Labstat International ULC

8.5 Revision 4

8.5.1 Technical Director (Toxicology)

This report has been reviewed by me and is certified, to the best of my knowledge, to be a true and accurate description of the procedures, protocols and test methods used to arrive at the data and/or findings that accompany this report.

Dated: December 22, 2010



Amit Trivedi, Ph.D.,
Technical Director (Toxicology)
Labstat International ULC

8.5.2 Senior Statistician

This report has been reviewed by me and is certified, to the best of my knowledge, to be a true and accurate description of the statistical analysis methodologies used to arrive at the findings that accompany this report.

Dated: December 22, 2010

A handwritten signature in black ink that reads 'Wendy Wagstaff'.

Wendy Wagstaff
Senior Statistician
Labstat International ULC

Appendix A

Scope of Accreditation



Standards Council of Canada
Conseil canadien des normes

200-270, rue Albert St.
Ottawa, ON (Canada)
K1P 6N7

Canada

Tel.: +1 613 238 3222

Fax.: +1 613 569 7808

E-mail/Courriel : info@scc.ca

Internet: <http://www.scc.ca>

SCOPE OF ACCREDITATION

LABSTAT INTERNATIONAL ULC

262 Manitou Drive, Unit 5

Kitchener, ON

N2C 1L3

Accredited Laboratory No. 368

(Conforms with requirements of CAN-P-4E (ISO/IEC 17025:2005))

CONTACT: Mr. Lucian Hirtie
TEL: (519) 748-5409
FAX: (519) 748-1654
EMAIL: lhirtie@labstat.com

CLIENTS SERVED: All interested parties

FIELDS OF TESTING: Biological, Chemical/Physical

ISSUED ON: 2007-03-08

VALID TO: 2012-01-22

Remarque: La présente portée d'accréditation existe également en français, sous la forme d'un document distinct.

Note: This scope of accreditation is also available in French as a separately issued document.

ANIMAL AND PLANTS (AGRICULTURE)

Agricultural products: (except food and chemicals)

Tobacco

AOAC 966.02	Moisture in Tobacco
ASTM E2187	Standard Test Method for Measuring the Ignition Strength of Cigarettes
ISO 10315	Cigarettes – Determination of Nicotine in Smoke
	Condensates Gas-Chromatographic Method
ISO 10362-1	Cigarettes – Determination of Water in Smoke Condensates –

The approved and most recent version of this document can be viewed on the SCC website at <http://palcan.scc.ca/SpecsSearch/GLSearchForm.do>

Page 1 of 5

Standards Council of Canada Accredited Laboratory No. 368

	Part 1: Gas–Chromatographic Method
ISO 3308	Routine Analytical Cigarette–Smoking Machine– Definitions and Standard Conditions
ISO 3402	Tobacco and Tobacco Products – Atmosphere for Conditioning and Testing
ISO 4387	Cigarettes – Determination of Total and Nicotine–Free Dry Particulate Matter Using a Routine Analytical Smoking Machine
ISO 6565	Tobacco and Tobacco Products – Draw Resistance of Cigarettes and Pressure Drop of Filter Rods–Standard Conditions and Measurement
ISO 8454	Cigarettes – Determination of Carbon Monoxide in the Vapour Phase of Cigarette Smoke – NDIR method
TMS–118	Determination of Volatile Nitrosamines in Mainstream Tobacco Smoke
TMS–120	Determination of Selected Polynuclear Aromatic Hydrocarbons (PAHs) in Mainstream Tobacco Smoke
TMS–127	Determination of Selected Polynuclear Aromatic Hydrocarbons (PAHs) And Aza–Arenes in the Particulate Phase of Mainstream Tobacco Smoke
TMS–128	Determination of Aromatic Amines in Mainstream Tobacco smoke (Expanded list: Aniline, o–Toluidine, m–Toluidine, p–Toluidine, o–Anisidine, 1– and 2–Aminonaphthalene and 3– and 4–Aminobiphenyl)
TMS–132	Determination of Gas Phase and Particulate Phase Free Radicals in Mainstream Smoke
TMS–133	Determination of Heterocyclic Aromatic Amines (HAAs) in Mainstream Tobacco Smoke
TMS–135	Determination of Tobacco Specific Nitrosamines in Mainstream Smoke by High–Performance Liquid Chromatography–ESI–Tandem Mass Spectrometry
TSS–219	Determination of Selected Polynuclear Aromatic Hydrocarbons (PAHs) in Sidestream Smoke
TWT–303	Determination of Carbonyls in Whole Tobacco
TWT–315	Determination of N–Methyl Carbamate Pesticides in Tobacco
TWT–316	Determination of Organophosphate Pesticides in Tobacco
TWT–317	Determination of Organochlorine Pesticides in Process Tobacco
TWT–318	Determination of Ethylene–Bis–Dithiocarbamate (EBDC) in Whole Tobacco
TWT–319	Determination of Benomyl Carbendazim in Tobacco
TWT–321	Determination Of Nicotine Alkaloids And Reducing Sugars In Whole Tobacco
TWT–322	Determination of Chlorophenoxy Acid Herbicides in Process Tobacco
TWT–323	Determination of Isovaleric Acid and 3–Methylvaleric Acid in Tobacco

The approved and most recent version of this document can be viewed on the SCC website at <http://palcan.scc.ca/SpecsSearch/GLSearchForm.do>

Page 2 of 5

Standards Council of Canada Accredited Laboratory No. 368

TWT-324	Determination of Nicotine in Whole Tobacco (CDC method)
TWT-325	Determination of Pectin in Tobacco
TWT-333	Determination of Tobacco Specific Nitrosamines in Whole Tobacco by High-Performance Liquid Chromatography-ESI-Tandem Mass Spectrometry

(Health Canada Tobacco Reporting Regulations Official Methods)

T-101	Determination of Ammonia in Mainstream Tobacco Smoke
T-102	Determination of 1- and 2- Aminonaphthalene and 3- and 4- Aminobiphenyl in Mainstream Tobacco Smoke
T-103	Determination of Benzo[a]pyrene in Mainstream Tobacco Smoke
T-104	Determination of Selected Carbonyls in Mainstream Tobacco Smoke
T-105	Determination of Eugenol in Mainstream Tobacco Smoke
T-106	Determination of Filter Efficiency in Mainstream Tobacco Smoke
T-107	Determination of Hydrogen Cyanide in Mainstream Tobacco Smoke
T-108	Determination of Mercury in Mainstream Tobacco Smoke
T-109	Determination of Ni, Pb, Cd, Cr, As and Se in Mainstream Tobacco Smoke
T-110	Determination of Oxides of Nitrogen in Mainstream Tobacco Smoke
T-111	Determination of Nitrosamines in Mainstream Tobacco Smoke
T-112	Determination of Pyridine, Quinoline and Styrene in Mainstream Tobacco Smoke
T-113	Determination of Mainstream Tobacco Smoke pH
T-114	Determination of Phenolic Compounds in Mainstream Tobacco Smoke
T-115	Determination of Tar, Nicotine and Carbon Monoxide in Mainstream Tobacco Smoke
T-116	Determination of 1,3- Butadiene, Isoprene, Acrylonitrile, Benzene and Toluene in Mainstream Tobacco Smoke
T-201	Determination of Ammonia in Sidestream Tobacco Smoke
T-202	Determination of 1- and 2- Aminonaphthalene and 3- and 4- Aminobiphenyl in Sidestream Tobacco Smoke
T-203	Determination of Benzo[a]pyrene in Sidestream Tobacco Smoke
T-203A	Determination of Benzo[a]pyrene in Sidestream Tobacco Smoke (GC/MS)
T-204	Determination of Selected Carbonyls in Sidestream Tobacco Smoke
T-205	Determination of Hydrogen Cyanide in Sidestream Tobacco Smoke
T-206	Determination of Mercury in Sidestream Tobacco Smoke

The approved and most recent version of this document can be viewed on the SCC website at <http://paican.scc.ca/SpecsSearch/GLSearchForm.do>

Page 3 of 5

Standards Council of Canada Accredited Laboratory No. 368

T-207	Determination of Toxic Trace Metals in Sidestream Smoke
T-208	Determination of Oxides of Nitrogen in Sidestream Tobacco Smoke
T-209	Determination of Nitrosamines in Sidestream Tobacco Smoke
T-210	Determination of Pyridine and Quinoline in Sidestream Tobacco Smoke
T-211	Determination of Phenolic Compounds in Sidestream Tobacco Smoke
T-212	Determination of "Tar" and Nicotine in Sidestream Tobacco Smoke
T-213	Determination of 1,3 Butadiene, Isoprene, Acrylonitrile, Benzene, Toluene and Styrene in Sidestream Tobacco Smoke
T-214	Determination of Carbon Monoxide (CO) in Sidestream Tobacco Smoke
T-301	Determination of Alkaloids in Whole Tobacco
T-302	Determination of Ammonia in Whole Tobacco
T-304	Determination of Humectants in Whole Tobacco
T-306	Determination of Ni, Pb, Cd, Cr, As, Se and Hg in Whole Tobacco
T-307	Determination of Benzo[a]pyrene in Whole Tobacco
T-308	Determination of Nitrate in Whole Tobacco
T-309	Determination of Nitrosamines in Whole Tobacco
T-310	Determination of Whole Tobacco pH
T-311	Determination of Triacetin in Whole Tobacco
T-312	Determination of Sodium Propionate in Whole Tobacco
T-313	Determination of Sorbic Acid in Whole Tobacco
T-314	Determination of Eugenol in Whole Tobacco
T-401	Preparation of Cigarettes from Packaged Leaf Tobacco for Testing
T-402	Preparation of Cigarettes, Cigarette Tobacco, Cigars, Kreteks, Bidis, Packaged Leaf Tobacco, Pipe Tobacco and Smokeless Tobacco for testing

(Microbiology Tests)

T-501	Bacterial Reverse Mutation Assay for Mainstream Tobacco Smoke
T-502	Neutral Red Uptake Assay for Mainstream Tobacco Smoke
T-503	In Vitro Micronucleus Assay for Mainstream Tobacco Smoke
TBA-504	<i>In vitro</i> Sister Chromatid Exchange (SCE) Assay for Mainstream Tobacco Smoke

(Other: Measures of Exposure)

TME-001	Determination of Nicotine, Cotinine and Caffeine in Human Physiological Fluid Samples
---------	---

The approved and most recent version of this document can be viewed on the SCC website at <http://palcan.scc.ca/SpecsSearch/GLSearchForm.do>

Page 4 of 5

Standards Council of Canada Accredited Laboratory No. 368

TME-002	Determination of Creatinine in Urine
TME-003	Determination of 3-Hydroxycotinine in Human Physiological Fluid Samples
TME-004	<i>Salmonella Typhimurium</i> Reverse Mutation Assay: Microsuspension Method For Testing Urine Mutagenicity
TME-005	Determination of Nicotine and Major Metabolites in Human Urine Using LC-MS-MS

Notes:

AOAC: Association of Official Analytical Chemists

ASTM: American Society for Testing and Materials

CAN-P-4E (ISO/IEC 17025): General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025-2005)

ISO: International Organization for Standardization

T: Health Canada Tobacco Reporting Regulations Official Methods

TBA: Test Method, Biological Activity

TME: Test Method, Measures of Exposure

TMS: Test method, Mainstream Smoke

TSS: Test method, Sidestream Smoke

TWT: Test method, Whole Tobacco

P. Paladino, P. Eng., Director, Conformity Assessment

Date: 2007-03-08

Number of Scope Listings: 83

SCC 1003-15/420

Partner File #0

Partner: None

Appendix B

“Raw” Data and Analysis Results (See Enclosed CD)

Use of Labstat's¹ Analytical Reports²

Labstat International ULC is a recognized centre of analytical excellence related to tobacco and tobacco products. Our clients include major international tobacco manufacturers, various Governments and Government agencies such as the Canadian Federal Department of Health and the Massachusetts Department of Public Health, agricultural interests, university researchers and private research interests. Normally our contractual obligations extend **only** to the provision of data and related reports.

It should be noted³, in this regard, that

All analytical data and reports, provided by Labstat International ULC, are for the exclusive use of the person, partnership, or corporation to whom it is addressed, and neither the data, the report nor the name of the laboratory (Labstat International ULC) nor any member of its staff may be used in connection with the advertising or sale of any product or process without written authorization from the CEO of the company or his designate. Labstat International ULC is not responsible for unauthorized use of test reports.

The following also applies to reported data.

All Labstat reports on testing relate only to the sample received and tested by it at the time of testing. Labstat warrants that all samples submitted were tested in accordance with its standard test procedures. Except as stated herein, there is no warranty expressed or implied, statutory or other wise, as to the results of Labstat tests. Labstat does not warrant or guarantee the fitness of the materials from which the samples have been drawn for any particular purpose including without limitation for consumption as cigarettes, cigars, smokeless tobacco or any other form of tobacco or tobacco-related product.

¹. Labstat International ULC,
262 Manitou Drive, Kitchener, ON Canada N2C 1L3
Phone: (519) 748-5409; Fax: (519) 748-1654; Email: labstat@labstat.com

². This document may not be reproduced, in whole or in part in any form, without the written consent of the author(s) on behalf of Labstat International ULC

³. Unless superseded by a specific contractual obligation or other written agreement.

Attribution Policy

Labstat International ULC ("Labstat") is a private independent analytical laboratory whose services are generally limited to the analysis of tobacco and tobacco related products ("product") provided by clients. Neither Labstat, as a company, nor its personnel, as individuals, participate in product development, product preparation or the design of experiments related to product characteristics. It is for this reason that the company does not allow the use of its name (Labstat International ULC), any part of its name, its address (262 Manitou Drive, Kitchener, Ontario Canada), or any part of its address, its logo (as shown below) or the name of any of its employees to be used in either indirect or direct product marketing or advertising including but not limited to press releases, advertisements in the print media, or public statements regarding product attributes based on test results.



Sample ID	Sample Description
084394	Camel SNUS Frost
084395	2S3 Research Moist smokeless tobacco
084454	Fresh Strips
084455	Mellow Sticks
084456	Copenhagen Long Cut
084457	Ariva Wintergreen
084458	Fresh Orbs



Limits of Detection (LOD) and Limits of Quantification (LOQ) Determined for Selected Constituents in Processed Tobacco

Health Canada Method	Analyte	Units	Processed Tobacco	
			LOD	LOQ
T-301	Alkaloids			
	Nicotine	µg/g (dry wt)	75.0	250

Abbreviations: BDL, below detection limit; NQ, below quantitation limit; N/A, not applicable
Date of last review: March 4, 2008

NOTE: The above limits referred to samples processed as required by the referenced Health Canada Method (ie. either "as received" or "dried"). Corrections for the moisture content, determined independently, must be applied where applicable in order to convert the "as received" limits to limits expressed on a "dry weight" basis.

*NOTE: The LOD and LOQ are based on the lowest standard used for calibration of the instruments as referenced in the Health Canada Method.

LOD Definition: The limit of detection (LOD) for a particular analyte is a statistically defined decision point that, with a specified probability, measured results falling at or above this point are interpreted to indicate an analyte concentration greater than zero within the sample.

LOQ Definition: The limit of quantification for a particular analyte is another statistically defined decision point that results falling at or above this point can be assigned a statistically significant numerical value with an associated level of precision. Values falling between the LOD and LOQ are interpreted as a positive but not quantifiable result for the analyte in question.

Matrix Code	Sample ID	Nicotine (µg/g)				Dry Matter (%)				Moisture (%)			
		Average	St Dev	L. Limit (95%)	U. Limit (95%)	Average	St Dev	L. Limit (95%)	U. Limit (95%)	Average	St Dev	L. Limit (95%)	U. Limit (95%)
WT	084394	18575	152	18197	18952	68.3	0.1	67.9	68.6	31.7	0.1	31.4	32.1
WT	084395	30659	442	29561	31758	46.0	0.0	45.9	46.1	54.0	0.0	53.9	54.1
WT	084454	4314	93	4084	4545	88.9	0.1	88.7	89.1	11.1	0.1	10.9	11.3
WT	084455	5110	95	4873	5348	93.9	0.0	93.9	94.0	6.07	0.03	6.00	6.15
WT	084456	27568	687	25861	29275	44.6	0.1	44.3	45.0	55.4	0.1	55.0	55.7
WT	084457	5203	359	4311	6095	96.3	0.0	96.3	96.4	3.68	0.02	3.62	3.73
WT	084458	2784	46	2670	2898	94.9	0.0	94.8	94.9	5.14	0.01	5.11	5.17

Glossary of Abbreviations

L. Limit (95%) - lower limit of the 95% confidence interval

U. Limit (95%) - upper limit of the 95% confidence interval

**Table 1: Nicotine and Nicotine Related Contents of Processed Toba
(‘Dry Weight’ Basis)**

Sample ID	Nicotine (µg/g)
084394	18495
084394	18750
084394	18479
Average	18575
Std. Dev.	152
L. Limit (95%)	18197
U. Limit (95%)	18952
084395	30149
084395	30910
084395	30919
Average	30659
Std. Dev.	442
L. Limit (95%)	29561
U. Limit (95%)	31758
084454	4325
084454	4216
084454	4401
Average	4314
Std. Dev.	93
L. Limit (95%)	4084
U. Limit (95%)	4545
084455	5204
084455	5114
084455	5013
Average	5110
Std. Dev.	95
L. Limit (95%)	4873
U. Limit (95%)	5348
084456	27370
084456	28332
084456	27001
Average	27568
Std. Dev.	687
L. Limit (95%)	25861
U. Limit (95%)	29275

**Table 1: Nicotine and Nicotine Related Contents of Processed Toba
(‘Dry Weight’ Basis)**

Sample ID	Nicotine (µg/g)
084457	5594
084457	4887
084457	5130
Average	5203
Std. Dev.	359
L. Limit (95%)	4311
U. Limit (95%)	6095
084458	2807
084458	2814
084458	2731
Average	2784
Std. Dev.	46
L. Limit (95%)	2670
U. Limit (95%)	2898

Table 13: Moisture Content of Processed Tobacco

Sample ID	Dry Matter (%)	Moisture (%)
084394	68.3	31.7
084394	68.4	31.6
084394	68.1	31.9
Average	68.3	31.7
Std. Dev.	0.1	0.1
L. Limit (95%)	67.9	31.4
U. Limit (95%)	68.6	32.1
084395	45.9	54.1
084395	46.0	54.0
084395	46.0	54.0
Average	46.0	54.0
Std. Dev.	0.0	0.0
L. Limit (95%)	45.9	53.9
U. Limit (95%)	46.1	54.1
084454	89.0	11.0
084454	88.9	11.1
084454	88.8	11.2
Average	88.9	11.1
Std. Dev.	0.1	0.1
L. Limit (95%)	88.7	10.9
U. Limit (95%)	89.1	11.3
084455	93.9	6.05
084455	93.9	6.11
084455	93.9	6.06
Average	93.9	6.07
Std. Dev.	0.0	0.03
L. Limit (95%)	93.9	6.00
U. Limit (95%)	94.0	6.15
084456	44.7	55.3
084456	44.5	55.5
084456	44.8	55.2
Average	44.6	55.4
Std. Dev.	0.1	0.1
L. Limit (95%)	44.3	55.0
U. Limit (95%)	45.0	55.7

Table 13: Moisture Content of Processed Tobacco

Sample ID	Dry Matter (%)	Moisture (%)
084457	96.3	3.65
084457	96.3	3.68
084457	96.3	3.70
Average	96.3	3.68
Std. Dev.	0.0	0.02
L. Limit (95%)	96.3	3.62
U. Limit (95%)	96.4	3.73
084458	94.9	5.13
084458	94.8	5.15
084458	94.9	5.14
Average	94.9	5.14
Std. Dev.	0.0	0.01
L. Limit (95%)	94.8	5.11
U. Limit (95%)	94.9	5.17

LABSTAT INTERNATIONAL ULC

262 Manitou Drive, Kitchener, Ontario, Canada N2C 1L3

Phone (519) 748-5409 FAX (519) 748-1654

Project: M97

Period: September 15, 2008

**Smoking Data[†] for Ames Assay analysis:
Mutagenesis in *Salmonella typhimurium***

Set Number	Run Number	Sample ID	Replicate Number	Smoking Date	Cigarettes Smoked	Puff Count (per cig)	Weight of MS TPM (mg)**	Smoking Machine
1	2	084396	1	15-Sep-08	20	10.1	213	Borgwaldt Rotary
1	3	084396	2	15-Sep-08	20	9.2	215	Borgwaldt Rotary
1	4	084396	3	15-Sep-08	20	9.1	225	Borgwaldt Rotary

[†] Samples generated under 'ISO' smoking conditions:

35mL puff volume; 60 second interval; 2 second duration; no vent blocking.

** Samples extracted in DMSO to give a final concentration of 10.0 mg/mL.

**Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	TPM Dose (µg/plate)	TPM-H ₂ O (DPM) (µg/plate)	Nicotine (µg/plate)	TA98 (+S9)			TA100 (+S9)			TA1535 (+S9)			TA1537 (+S9)			TA102 (+S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
1	2	084396	1	0	0	0	46	42	39	158	153	141	14	18	9	7	6	11	321	312	316
1	2	084396	1	25	23	2	90	73	74	158	150	148	10	19	10	15	18	14	320	322	313
1	2	084396	1	50	46	4	124	102	121	180	154	184	7	12	13	27	24	35	346	289	302
1	2	084396	1	75	69	6	166	141	178	197	190	209	16	19	14	32	34	31	287	280	287
1	2	084396	1	100	93	8	191	188	186	213	221	223	13	12	16	34	36	32	283	313	294
1	2	084396	1	125	116	9	206	199	211	230	203	198	9	20	8	52	42	55	295	308	306
1	2	084396	1	250	231	19	369	352	332	296	303	302	23	12	17	88	77	86	318	304	320
1	2	084396	1	500	463	38	483	490	509	351	376	352	16	22	20	100	88	96	305	299	291
1	3	084396	2	0	0	0	48	48	36	181	161	157	11	17	9	7	6	5	263	294	268
1	3	084396	2	25	23	2	77	83	81	176	171	191	14	11	10	21	17	19	295	317	312
1	3	084396	2	50	46	4	150	139	162	182	186	213	12	9	8	32	35	40	286	326	326
1	3	084396	2	75	69	6	173	154	188	250	232	242	14	13	7	43	37	42	292	322	310
1	3	084396	2	100	93	8	273	293	268	251	242	246	12	20	11	42	47	39	334	302	315
1	3	084396	2	125	116	9	358	324	326	260	251	254	10	14	8	45	50	43	311	332	304
1	3	084396	2	250	231	19	528	499	498	334	357	362	11	16	11	69	67	68	305	290	321
1	3	084396	2	500	463	38	509	533	536	362	347	334	22	12	9	66	74	67	333	313	371
1	4	084396	3	0	0	0	49	47	33	153	172	168	14	11	12	6	5	7	274	315	294
1	4	084396	3	25	23	2	64	59	89	160	163	181	16	18	16	18	20	19	317	328	349
1	4	084396	3	50	46	4	151	153	173	197	186	166	17	17	11	32	30	42	351	285	336
1	4	084396	3	75	69	6	186	212	202	200	219	236	10	20	17	30	41	42	352	346	355
1	4	084396	3	100	93	8	271	263	269	246	249	268	14	12	12	37	57	32	300	324	320
1	4	084396	3	125	116	9	299	288	291	258	260	286	17	10	12	53	55	45	325	315	318
1	4	084396	3	250	231	19	339	309	331	368	352	382	11	14	16	86	75	64	374	353	330
1	4	084396	3	500	463	38	447	448	482	NA	368	397	20	15	22	90	87	78	372	364	380

N/A - data not available due to lack of bacterial growth or assay plate contamination

NOTE: TPM, Moisture and Nicotine contents of sample 084396 (Kentucky Reference 2R4F) were estimated based on existing historical data:

TPM = 10 mg/cigarette

Moisture = 0.75 mg/cigarette

Nicotine = 0.75 mg/cigarette

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	TPM Dose (µg/plate)	TPM-H ₂ O (DPM) (µg/plate)	Nicotine (µg/plate)	TA98 (-S9)			TA100 (-S9)			TA1535 (-S9)			TA1537 (-S9)			TA102 (-S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
1	2	084396	1	0	0	0	34	31	28	136	148	154	18	16	10	5	6	7	278	289	306
1	2	084396	1	25	23	2	30	28	29	161	151	168	11	17	16	8	9	12	273	257	266
1	2	084396	1	50	46	4	31	30	38	173	160	184	19	20	16	9	10	7	293	294	292
1	2	084396	1	75	69	6	28	28	29	185	164	183	10	13	19	11	7	9	306	294	288
1	2	084396	1	100	93	8	47	36	37	186	177	169	18	17	12	11	9	8	280	282	291
1	2	084396	1	125	116	9	26	27	37	186	193	200	20	14	19	7	9	10	296	294	282
1	2	084396	1	250	231	19	36	40	40	210	208	211	14	10	14	9	13	12	266	268	266
1	2	084396	1	500	463	38	66	57	62	232	223	231	23	12	16	7	8	6	264	256	266
1	3	084396	2	0	0	0	29	27	20	151	153	153	20	19	16	6	7	5	271	286	270
1	3	084396	2	25	23	2	23	24	25	174	154	160	17	19	19	8	7	6	317	306	301
1	3	084396	2	50	46	4	30	23	26	170	192	179	22	20	14	9	7	6	290	298	301
1	3	084396	2	75	69	6	28	29	27	174	180	170	17	22	18	7	8	9	298	281	286
1	3	084396	2	100	93	8	31	33	30	183	186	196	20	14	14	11	10	7	319	321	308
1	3	084396	2	125	116	9	39	22	29	177	193	189	14	25	17	9	7	8	296	313	311
1	3	084396	2	250	231	19	32	31	24	194	174	201	16	20	13	10	13	9	310	306	298
1	3	084396	2	500	463	38	86	79	66	209	197	211	28	19	24	7	8	6	294	294	283
1	4	084396	3	0	0	0	26	27	48	154	153	149	14	18	17	5	6	7	279	285	271
1	4	084396	3	25	23	2	29	21	26	158	148	167	15	18	10	6	8	7	291	277	276
1	4	084396	3	50	46	4	36	27	30	146	157	141	19	17	17	9	12	10	285	288	285
1	4	084396	3	75	69	6	26	23	31	147	173	162	19	16	13	9	10	8	302	303	294
1	4	084396	3	100	93	8	33	33	30	154	144	160	11	14	14	10	9	11	289	274	293
1	4	084396	3	125	116	9	29	34	32	191	184	176	17	13	12	10	11	13	297	294	287
1	4	084396	3	250	231	19	39	32	46	178	187	189	14	14	13	21	19	20	295	278	288
1	4	084396	3	500	463	38	48	62	51	186	190	200	14	18	20	8	9	7	299	304	306

N/A - data not available due to lack of bacterial growth or assay plate contamination

NOTE: TPM, Moisture and Nicotine contents of sample 084396 (Kentucky Reference 2R4F) were estimated based on existing historical data:

TPM = 10 mg/cigarette

Moisture = 0.75 mg/cigarette

Nicotine = 0.75 mg/cigarette

Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	TPM Dose (µg/plate)	TPM-H ₂ O (DPM) (µg/plate)	Nicotine (µg/plate)	TA98 (+S9)		TA100 (+S9)		TA1535 (+S9)		TA1537 (+S9)		TA102 (+S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	2	084396	1	0	0	0	42	4	151	9	14	5	8	3	316	5
1	2	084396	1	25	23	2	79	10	152	5	13	5	16	2	318	5
1	2	084396	1	50	46	4	116	12	173	16	11	3	29	6	312	30
1	2	084396	1	75	69	6	162	19	199	10	16	3	32	2	285	4
1	2	084396	1	100	93	8	188	3	219	5	14	2	34	2	297	15
1	2	084396	1	125	116	9	205	6	210	17	12	7	50	7	303	7
1	2	084396	1	250	231	19	351	19	300	4	17	6	84	6	314	9
1	2	084396	1	500	463	38	494	13	360	14	19	3	95	6	298	7
1	3	084396	2	0	0	0	44	7	166	13	12	4	6	1	275	17
1	3	084396	2	25	23	2	80	3	179	10	12	2	19	2	308	12
1	3	084396	2	50	46	4	150	12	194	17	10	2	36	4	313	23
1	3	084396	2	75	69	6	172	17	241	9	11	4	41	3	308	15
1	3	084396	2	100	93	8	278	13	246	5	14	5	43	4	317	16
1	3	084396	2	125	116	9	336	19	255	5	11	3	46	4	316	15
1	3	084396	2	250	231	19	508	17	351	15	13	3	68	1	305	16
1	3	084396	2	500	463	38	526	15	348	14	14	7	69	4	339	29
1	4	084396	3	0	0	0	43	9	164	10	12	2	6	1	294	21
1	4	084396	3	25	23	2	71	16	168	11	17	1	19	1	331	16
1	4	084396	3	50	46	4	159	12	183	16	15	3	35	6	324	35
1	4	084396	3	75	69	6	200	13	218	18	16	5	38	7	351	5
1	4	084396	3	100	93	8	268	4	254	12	13	1	42	13	315	13
1	4	084396	3	125	116	9	293	6	268	16	13	4	51	5	319	5
1	4	084396	3	250	231	19	326	16	367	15	14	3	75	11	352	22
1	4	084396	3	500	463	38	459	20	383	21	19	4	85	6	372	8

*Values represent the mean number of revertants (average of three plates)

Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	TPM Dose (µg/plate)	TPM-H ₂ O (DPM) (µg/plate)	Nicotine (µg/plate)	TA98 (-S9)		TA100 (-S9)		TA1535 (-S9)		TA1537 (-S9)		TA102 (-S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	2	084396	1	0	0	0	31	3	146	9	15	4	6	1	291	14
1	2	084396	1	25	23	2	29	1	160	9	15	3	10	2	265	8
1	2	084396	1	50	46	4	33	4	172	12	18	2	9	2	293	1
1	2	084396	1	75	69	6	28	1	177	12	14	5	9	2	296	9
1	2	084396	1	100	93	8	40	6	177	9	16	3	9	2	284	6
1	2	084396	1	125	116	9	30	6	193	7	18	3	9	2	291	8
1	2	084396	1	250	231	19	39	2	210	2	13	2	11	2	267	1
1	2	084396	1	500	463	38	62	5	229	5	17	6	7	1	262	5
1	3	084396	2	0	0	0	25	5	152	1	18	2	6	1	276	9
1	3	084396	2	25	23	2	24	1	163	10	18	1	7	1	308	8
1	3	084396	2	50	46	4	26	4	180	11	19	4	7	2	296	6
1	3	084396	2	75	69	6	28	1	175	5	19	3	8	1	288	9
1	3	084396	2	100	93	8	31	2	188	7	16	3	9	2	316	7
1	3	084396	2	125	116	9	30	9	186	8	19	6	8	1	307	9
1	3	084396	2	250	231	19	29	4	190	14	16	4	11	2	305	6
1	3	084396	2	500	463	38	77	10	206	8	24	5	7	1	290	6
1	4	084396	3	0	0	0	34	12	152	3	16	2	6	1	278	7
1	4	084396	3	25	23	2	25	4	158	10	14	4	7	1	281	8
1	4	084396	3	50	46	4	31	5	148	8	18	1	10	2	286	2
1	4	084396	3	75	69	6	27	4	161	13	16	3	9	1	300	5
1	4	084396	3	100	93	8	32	2	153	8	13	2	10	1	285	10
1	4	084396	3	125	116	9	32	3	184	8	14	3	11	2	293	5
1	4	084396	3	250	231	19	39	7	185	6	14	1	20	1	287	9
1	4	084396	3	500	463	38	54	7	192	7	17	3	8	1	303	4

*Values represent the mean number of revertants (average of three plates)

**Mutagenesis in *Salmonella typhimurium* with (+) and without (-) S9 Metabolic Activation
(Date of assay)**

Set Number	Run Number	Sample ID	Replicate Number	TA98		TA100		TA1535		TA1537		TA102	
				+S9	-S9	+S9	-S9	+S9	-S9	+S9	-S9	+S9	-S9
1	2	084396	1	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
1	3	084396	2	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
1	4	084396	3	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08

LABSTAT INTERNATIONAL ULC

262 Manitou Drive, Kitchener, Ontario, Canada N2C 1L3

Phone (519) 748-5409 FAX (519) 748-1654

Project: M97

Period: September 15 - 19, 2008

Sample Generation and Extraction Data for Ames Assay analysis:
Mutagenesis in *Salmonella typhimurium*

Set Number	Run Number	Sample ID	Replicate Number	Extraction Date	Tobacco Weight (g)	DMSO Solvent Volume (mL)	mg Tobacco per mL DMSO	Dry Matter (%)	mg (Tobacco-H ₂ O) per mL DMSO	mg Nicotine per mL DMSO	Nicotine in WT Equivalent (mg/g)
1	3	084394	1	15-Sep-08	2.5000	22.5	111.111	68.27	75.861	1.28	11.5
1	4	084394	2	15-Sep-08	2.5009	22.5	111.151		75.888	1.43	12.9
1	7	084394	3	15-Sep-08	2.5005	22.5	111.133		75.876	1.34	12.1
1	2	084395	1	15-Sep-08	2.5012	22.5	111.164	45.98	51.116	1.56	14.0
1	5	084395	2	15-Sep-08	2.5011	22.5	111.160		51.115	1.59	14.3
1	6	084395	3	15-Sep-08	2.5008	22.5	111.147		51.109	1.49	13.4
2	4	084454	1	19-Sep-08	2.5010	22.5	111.156	88.90	98.814	0.400	3.60
2	6	084454	2	19-Sep-08	2.5008	22.5	111.147		98.806	0.433	3.89
2	14	084454	3	19-Sep-08	2.5010	22.5	111.156		98.814	0.443	3.98
2	5	084455	1	19-Sep-08	2.5011	22.5	111.160	93.93	104.409	0.614	5.52
2	13	084455	2	19-Sep-08	2.5017	22.5	111.187		104.434	0.581	5.23
2	17	084455	3	19-Sep-08	2.5000	22.5	111.111		104.363	0.618	5.56
2	3	084456	1	19-Sep-08	2.5015	22.5	111.178	44.63	49.622	1.29	11.6
2	7	084456	2	19-Sep-08	2.5012	22.5	111.164		49.616	1.33	11.9
2	9	084456	3	19-Sep-08	2.5017	22.5	111.187		49.626	1.35	12.2
2	8	084457	1	19-Sep-08	2.5004	22.5	111.129	96.32	107.044	0.589	5.30
2	12	084457	2	19-Sep-08	2.5000	22.5	111.111		107.027	0.616	5.54
2	15	084457	3	19-Sep-08	2.5004	22.5	111.129		107.044	0.636	5.72
2	2	084458	1	19-Sep-08	2.5009	22.5	111.151	94.86	105.437	0.263	2.36
2	10	084458	2	19-Sep-08	2.5006	22.5	111.138		105.425	0.289	2.60
2	16	084458	3	19-Sep-08	2.5000	22.5	111.111		105.399	0.306	2.76

**Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)			TA100 (+S9)			TA1535 (+S9)			TA1537 (+S9)			TA102 (+S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
1	3	084394	1	0	0	0	44	32	41	147	142	152	11	18	12	5	6	8	296	311	292
1	3	084394	1	278	190	3	44	32	39	163	149	141	10	12	6	8	7	6	328	325	327
1	3	084394	1	556	379	6	32	43	38	149	133	167	13	13	8	10	8	11	331	328	327
1	3	084394	1	833	569	10	36	39	41	168	159	140	14	9	11	7	8	10	345	341	330
1	3	084394	1	1111	759	13	38	39	37	169	150	156	17	11	13	12	11	9	348	352	355
1	3	084394	1	1389	948	16	34	34	31	130	153	149	11	10	18	10	8	9	354	345	341
1	3	084394	1	2778	1897	32	41	30	32	141	144	143	8	16	11	16	17	12	365	373	356
1	3	084394	1	5556	3793	64	40	48	43	163	157	148	10	14	13	15	14	10	366	369	364
1	4	084394	2	0	0	0	43	24	22	163	149	144	13	14	17	7	6	5	220	246	259
1	4	084394	2	278	190	4	43	29	20	134	158	137	12	14	12	11	9	8	231	236	255
1	4	084394	2	556	379	7	23	18	39	158	139	138	17	10	12	7	6	9	228	244	244
1	4	084394	2	834	569	11	41	28	22	144	144	147	13	12	13	11	7	10	253	250	259
1	4	084394	2	1112	759	14	41	30	48	186	172	169	14	12	16	8	9	10	299	302	301
1	4	084394	2	1389	949	18	39	38	30	159	173	144	8	13	13	13	12	7	319	322	300
1	4	084394	2	2779	1897	36	41	38	39	137	154	159	12	10	16	14	11	12	316	319	324
1	4	084394	2	5558	3794	71	30	44	38	169	148	164	17	19	14	16	11	15	304	291	290
1	7	084394	3	0	0	0	31	34	31	157	158	148	10	12	11	10	9	8	295	304	303
1	7	084394	3	278	190	3	29	27	34	156	143	161	12	19	6	7	13	9	326	330	325
1	7	084394	3	556	379	7	29	30	37	162	166	151	16	16	14	10	9	8	330	324	332
1	7	084394	3	833	569	10	27	31	34	168	162	156	14	15	10	11	12	8	364	347	336
1	7	084394	3	1111	759	13	46	37	38	194	172	158	12	14	11	11	7	14	360	347	352
1	7	084394	3	1389	948	17	27	33	38	185	179	167	9	8	14	13	12	11	370	364	352
1	7	084394	3	2778	1897	34	24	13	29	168	174	178	13	14	12	11	13	14	332	324	327
1	7	084394	3	5557	3794	67	26	26	28	171	188	193	6	8	5	19	14	16	345	339	333
1	2	084395	1	0	0	0	28	29	36	163	157	151	16	9	10	6	7	8	287	306	314
1	2	084395	1	278	128	4	43	23	24	158	141	150	8	16	18	9	10	11	344	342	360
1	2	084395	1	556	256	8	22	27	31	142	133	159	9	10	17	12	11	13	354	345	355
1	2	084395	1	834	383	12	28	27	27	150	166	170	17	13	14	15	13	12	368	354	374
1	2	084395	1	1112	511	16	46	37	27	176	159	169	17	12	9	19	16	18	352	367	359
1	2	084395	1	1390	639	19	47	39	36	139	141	151	6	7	16	16	17	19	351	348	360
1	2	084395	1	2779	1278	39	28	46	38	162	160	162	13	11	10	17	18	19	332	346	364
1	2	084395	1	5558	2556	78	49	42	42	153	169	178	19	14	13	18	20	18	356	349	339
1	5	084395	2	0	0	0	46	44	37	167	144	138	17	12	16	9	8	7	294	307	290
1	5	084395	2	278	128	4	32	34	28	136	133	142	9	16	8	9	9	8	313	309	315
1	5	084395	2	556	256	8	30	31	32	163	138	153	16	12	12	7	8	7	311	305	312
1	5	084395	2	834	383	12	29	32	40	169	154	181	11	14	12	11	12	11	319	302	306
1	5	084395	2	1112	511	16	40	38	38	172	180	169	16	7	15	8	11	14	310	324	301
1	5	084395	2	1390	639	20	43	41	38	151	160	168	14	13	9	12	9	10	290	301	303
1	5	084395	2	2779	1278	40	39	36	35	176	181	170	10	14	14	11	12	14	304	309	296
1	5	084395	2	5558	2556	80	37	32	42	216	219	207	14	12	16	16	12	14	330	343	325
1	6	084395	3	0	0	0	34	40	30	165	177	152	10	11	8	7	6	5	312	309	313
1	6	084395	3	278	128	4	28	20	27	156	186	158	7	16	12	8	6	7	317	316	316
1	6	084395	3	556	256	7	30	24	29	166	176	162	14	9	16	8	7	9	317	311	314
1	6	084395	3	834	383	11	27	22	32	162	173	186	8	9	13	8	9	10	331	343	332
1	6	084395	3	1111	511	15	47	44	40	193	176	162	8	8	15	10	8	12	324	336	321
1	6	084395	3	1389	639	19	39	34	31	138	143	139	16	11	8	9	7	11	330	339	329
1	6	084395	3	2779	1278	37	40	34	34	148	159	153	11	14	8	10	8	13	337	346	330
1	6	084395	3	5557	2555	74	40	43	42	177	189	183	10	10	12	14	12	11	329	320	333

**Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)			TA100 (+S9)			TA1535 (+S9)			TA1537 (+S9)			TA102 (+S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
2	4	084454	1	0	0	0	27	27	32	100	96	82	18	18	9	10	14	9	307	302	314
2	4	084454	1	278	247	1	31	29	24	101	95	98	10	13	10	7	6	6	304	313	296
2	4	084454	1	556	494	2	30	28	20	114	103	96	16	17	10	7	9	7	306	291	271
2	4	084454	1	834	741	3	26	29	32	99	114	104	10	11	7	11	7	9	296	294	314
2	4	084454	1	1112	988	4	27	24	22	130	117	106	17	11	11	6	6	7	282	294	311
2	4	084454	1	1389	1235	5	26	24	20	126	116	110	14	12	9	8	7	10	320	310	318
2	4	084454	1	2779	2470	10	28	31	26	106	115	120	6	18	17	16	12	9	299	301	326
2	4	084454	1	5558	4941	20	22	25	28	118	120	125	14	11	19	8	8	9	303	314	301
2	6	084454	2	0	0	0	23	27	26	96	90	86	11	18	12	9	9	11	298	319	292
2	6	084454	2	278	247	1	29	30	21	96	92	88	14	15	19	11	11	8	305	310	307
2	6	084454	2	556	494	2	23	21	23	88	99	96	16	18	17	13	9	10	296	294	290
2	6	084454	2	834	741	3	19	19	26	90	103	108	11	20	10	7	7	9	293	304	296
2	6	084454	2	1111	988	4	24	25	24	110	100	102	12	10	16	7	14	10	296	307	319
2	6	084454	2	1389	1235	5	22	20	24	109	104	109	19	13	20	10	10	12	310	287	277
2	6	084454	2	2779	2470	11	27	24	30	120	115	122	13	20	17	11	10	8	276	267	287
2	6	084454	2	5557	4940	22	27	27	25	112	113	115	14	18	17	10	12	6	280	298	290
2	14	084454	3	0	0	0	27	23	37	90	99	96	19	17	20	7	8	8	305	297	308
2	14	084454	3	278	247	1	33	24	30	94	100	106	12	16	17	13	14	15	282	273	296
2	14	084454	3	556	494	2	21	22	23	96	100	110	13	16	14	6	6	7	272	300	301
2	14	084454	3	834	741	3	22	22	22	96	110	104	10	8	18	6	6	7	298	283	293
2	14	084454	3	1112	988	4	26	32	23	107	116	114	11	14	10	6	6	8	285	289	294
2	14	084454	3	1389	1235	6	26	21	19	104	114	121	17	11	7	9	7	8	285	290	284
2	14	084454	3	2779	2470	11	24	20	20	98	82	95	16	11	9	6	7	9	299	312	292
2	14	084454	3	5558	4941	22	21	22	23	103	100	96	17	14	11	8	8	6	281	288	313
2	5	084455	1	0	0	0	24	30	35	80	82	89	14	13	10	10	6	9	297	300	311
2	5	084455	1	278	261	2	24	20	21	84	90	92	11	18	13	15	11	10	299	286	282
2	5	084455	1	556	522	3	30	25	36	92	88	93	8	8	10	8	7	11	289	310	292
2	5	084455	1	834	783	5	23	24	34	100	88	94	9	9	8	12	9	12	309	310	289
2	5	084455	1	1112	1044	6	27	30	27	100	106	113	11	12	13	14	14	11	298	291	323
2	5	084455	1	1390	1305	8	23	22	20	98	111	114	12	16	9	9	9	13	296	324	312
2	5	084455	1	2779	2610	15	30	22	22	118	110	124	14	7	8	10	7	7	319	304	320
2	5	084455	1	5558	5220	31	22	22	21	103	92	106	10	13	12	8	8	10	312	326	304
2	13	084455	2	0	0	0	28	17	31	86	97	94	17	17	12	6	5	5	294	315	298
2	13	084455	2	278	261	1	24	21	21	106	100	95	13	12	14	7	8	5	311	306	311
2	13	084455	2	556	522	3	28	18	20	108	101	98	10	17	14	7	9	5	283	290	303
2	13	084455	2	834	783	4	23	22	39	111	113	103	13	19	14	6	7	6	297	303	281
2	13	084455	2	1112	1044	6	36	28	26	120	130	117	19	16	11	7	10	8	304	292	287
2	13	084455	2	1390	1305	7	25	22	28	122	108	112	9	12	17	6	7	6	306	287	304
2	13	084455	2	2780	2611	15	26	28	30	127	114	111	17	10	10	5	4	5	308	300	282
2	13	084455	2	5559	5222	29	24	26	21	98	111	116	6	11	14	8	7	10	306	308	316
2	17	084455	3	0	0	0	20	22	21	94	99	90	10	12	14	7	9	8	280	273	282
2	17	084455	3	278	261	2	26	22	20	98	106	96	11	10	11	10	10	8	282	286	276
2	17	084455	3	556	522	3	31	21	23	98	102	110	12	16	10	7	8	9	291	281	275
2	17	084455	3	833	783	5	24	31	22	114	111	119	16	18	12	7	7	6	272	264	256
2	17	084455	3	1111	1044	6	20	29	29	104	105	104	13	10	12	7	7	6	283	267	271
2	17	084455	3	1389	1305	8	21	24	24	110	108	121	13	12	14	7	6	5	282	300	305
2	17	084455	3	2778	2609	15	22	24	30	114	128	116	11	18	19	7	9	7	305	279	286
2	17	084455	3	5556	5218	31	29	30	28	115	106	120	11	10	13	12	9	13	279	285	306

**Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)			TA100 (+S9)			TA1535 (+S9)			TA1537 (+S9)			TA102 (+S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
2	3	084456	1	0	0	0	26	33	28	84	87	82	6	13	11	8	8	7	292	279	270
2	3	084456	1	278	124	3	26	22	21	87	89	88	11	17	13	10	9	9	280	250	283
2	3	084456	1	556	248	6	22	30	22	91	84	82	11	18	12	12	9	12	287	313	314
2	3	084456	1	834	372	10	24	28	22	89	102	90	11	12	11	8	6	10	298	297	294
2	3	084456	1	1112	496	13	20	20	24	96	100	111	16	14	10	14	14	12	280	314	313
2	3	084456	1	1390	620	16	27	34	28	122	107	111	9	7	10	11	11	10	303	324	327
2	3	084456	1	2779	1241	32	22	27	28	122	120	112	6	12	12	15	16	14	307	319	288
2	3	084456	1	5559	2481	65	37	37	50	93	114	98	11	18	12	13	14	12	324	346	320
2	7	084456	2	0	0	0	31	21	21	92	90	85	20	10	18	6	9	6	300	282	295
2	7	084456	2	278	124	3	22	19	24	90	99	96	15	11	13	8	7	8	304	306	297
2	7	084456	2	556	248	7	23	23	24	100	97	102	11	13	12	11	9	9	319	307	289
2	7	084456	2	834	372	10	24	20	21	94	108	114	20	19	13	10	9	6	288	314	320
2	7	084456	2	1112	496	13	30	33	23	126	137	120	14	11	12	14	14	10	299	305	311
2	7	084456	2	1390	620	17	24	24	23	128	111	115	11	14	17	10	8	11	310	278	295
2	7	084456	2	2779	1240	33	21	24	34	112	103	109	20	14	11	13	12	12	285	298	281
2	7	084456	2	5558	2481	66	33	42	40	106	118	120	13	15	18	13	12	8	321	313	314
2	9	084456	3	0	0	0	21	21	22	85	99	90	10	11	19	7	6	5	289	281	304
2	9	084456	3	278	124	3	20	23	30	96	98	90	13	11	12	10	8	10	310	296	306
2	9	084456	3	556	248	7	20	20	21	103	106	109	12	10	14	8	8	11	290	286	292
2	9	084456	3	834	372	10	20	29	22	104	105	113	10	11	23	8	10	10	300	295	284
2	9	084456	3	1112	496	14	36	23	20	119	110	106	12	18	13	10	11	12	272	279	280
2	9	084456	3	1390	620	17	24	20	20	116	118	120	18	10	12	13	13	14	308	317	308
2	9	084456	3	2780	1241	34	28	24	21	97	105	98	15	11	13	9	7	8	313	319	286
2	9	084456	3	5559	2481	68	37	30	30	84	95	99	10	12	13	13	14	17	319	300	324
2	8	084457	1	0	0	0	26	21	22	85	92	91	11	10	14	5	7	9	275	288	296
2	8	084457	1	278	268	1	21	23	26	99	96	107	11	12	9	7	8	7	293	294	301
2	8	084457	1	556	535	3	19	24	18	118	110	114	11	12	13	9	12	8	298	305	311
2	8	084457	1	833	803	4	24	26	24	120	116	123	10	17	15	12	14	9	317	308	300
2	8	084457	1	1111	1070	6	34	26	24	124	116	126	19	11	10	8	8	8	287	301	282
2	8	084457	1	1389	1338	7	20	26	23	102	108	98	11	13	18	11	13	8	312	318	306
2	8	084457	1	2778	2676	15	31	20	20	119	121	104	13	16	15	6	5	8	287	289	298
2	8	084457	1	5556	5352	29	28	24	23	107	112	107	16	20	19	5	5	11	284	282	289
2	12	084457	2	0	0	0	29	31	20	95	98	90	13	11	6	5	6	6	278	293	294
2	12	084457	2	278	268	2	28	20	26	101	94	92	11	11	16	7	5	7	303	281	296
2	12	084457	2	556	535	3	29	20	24	92	103	103	10	17	12	5	5	5	298	294	308
2	12	084457	2	833	803	5	20	27	20	108	112	99	17	8	16	6	7	8	299	315	312
2	12	084457	2	1111	1070	6	21	20	23	98	106	105	9	13	10	9	10	8	278	293	270
2	12	084457	2	1389	1338	8	23	19	20	120	103	105	18	8	11	7	9	8	292	265	287
2	12	084457	2	2778	2676	15	20	20	23	114	100	98	8	14	12	7	9	6	303	270	261
2	12	084457	2	5556	5351	31	21	19	23	112	113	114	13	20	17	8	9	11	298	294	289
2	15	084457	3	0	0	0	33	31	28	86	97	95	12	7	12	8	9	9	299	294	310
2	15	084457	3	278	268	2	29	24	26	100	92	98	10	16	18	9	6	NA	293	305	298
2	15	084457	3	556	535	3	27	35	33	105	100	114	12	12	13	5	5	6	304	296	294
2	15	084457	3	833	803	5	26	28	22	102	105	104	14	19	11	12	15	10	301	298	279
2	15	084457	3	1111	1070	6	22	30	32	117	100	104	10	9	13	11	10	9	312	322	296
2	15	084457	3	1389	1338	8	20	24	25	112	100	118	7	20	13	6	5	6	302	310	280
2	15	084457	3	2778	2676	16	29	28	22	101	98	111	8	7	10	6	7	9	285	299	302
2	15	084457	3	5556	5352	32	21	26	23	100	95	114	8	7	10	8	8	6	289	279	304

**Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)			TA100 (+S9)			TA1535 (+S9)			TA1537 (+S9)			TA102 (+S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
2	2	084458	1	0	0	0	24	30	20	102	93	86	10	14	10	9	10	10	270	263	255
2	2	084458	1	278	264	1	20	29	27	105	94	104	14	11	14	9	8	6	258	268	255
2	2	084458	1	556	527	1	26	26	26	107	98	101	11	12	13	8	6	11	320	330	325
2	2	084458	1	834	791	2	20	21	28	92	100	95	13	9	11	11	11	10	339	350	320
2	2	084458	1	1112	1054	3	37	21	22	96	111	92	9	16	16	6	9	12	250	234	230
2	2	084458	1	1389	1318	3	29	26	21	103	100	118	10	13	11	14	9	16	200	204	201
2	2	084458	1	2779	2636	7	27	22	28	109	96	94	10	12	12	11	13	8	233	230	214
2	2	084458	1	5558	5272	13	23	28	23	99	97	86	14	11	16	19	20	11	230	218	234
2	10	084458	2	0	0	0	27	24	20	92	94	90	16	13	NA	10	6	6	294	292	280
2	10	084458	2	278	264	1	28	26	20	90	97	100	11	11	16	5	8	5	294	281	300
2	10	084458	2	556	527	1	20	20	30	97	93	110	9	9	10	5	6	10	304	277	270
2	10	084458	2	834	791	2	21	NA	29	102	100	116	12	11	10	6	8	5	307	290	280
2	10	084458	2	1111	1054	3	29	21	20	104	104	97	9	9	7	12	7	11	303	286	282
2	10	084458	2	1389	1318	4	23	21	26	101	100	105	10	10	8	9	10	8	306	280	313
2	10	084458	2	2778	2636	7	22	20	22	96	106	95	9	11	11	8	8	5	309	300	302
2	10	084458	2	5557	5271	14	22	21	20	90	106	97	12	10	14	5	6	7	290	302	287
2	16	084458	3	0	0	0	23	20	20	84	90	96	18	20	14	8	8	7	274	281	301
2	16	084458	3	278	263	1	24	21	18	98	94	92	13	14	18	7	8	7	276	285	295
2	16	084458	3	556	527	2	21	20	21	94	100	98	17	12	13	6	5	7	254	295	284
2	16	084458	3	833	790	2	24	20	22	96	106	110	15	10	14	5	6	5	292	276	286
2	16	084458	3	1111	1054	3	24	23	28	117	104	105	11	18	10	8	9	10	254	275	271
2	16	084458	3	1389	1317	4	28	24	27	102	118	115	12	16	10	12	10	10	254	268	252
2	16	084458	3	2778	2635	8	29	31	36	110	105	110	13	12	11	5	6	6	234	255	261
2	16	084458	3	5556	5270	15	31	31	26	99	101	87	10	14	11	7	8	9	250	244	232

N/A - data not available due to lack of bacterial growth or assay plate contamination

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)			TA100 (-S9)			TA1535 (-S9)			TA1537 (-S9)			TA102 (-S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
1	3	084394	1	0	0	0	23	32	23	167	159	154	9	12	10	8	7	9	273	291	287
1	3	084394	1	278	190	3	29	28	27	166	174	167	14	12	16	13	9	10	320	325	338
1	3	084394	1	556	379	6	38	30	23	148	156	160	13	14	11	12	14	11	292	308	289
1	3	084394	1	833	569	10	26	24	28	172	162	159	18	16	16	14	10	12	309	293	294
1	3	084394	1	1111	759	13	30	31	20	179	187	162	14	11	17	14	13	14	304	301	291
1	3	084394	1	1389	948	16	24	24	21	144	152	161	14	17	19	13	16	14	294	300	301
1	3	084394	1	2778	1897	32	22	21	23	156	146	157	17	11	13	11	12	18	297	311	304
1	3	084394	1	5556	3793	64	29	27	26	178	182	180	18	17	5	16	16	17	285	284	288
1	4	084394	2	0	0	0	21	20	24	144	149	147	17	11	13	8	6	8	276	287	283
1	4	084394	2	278	190	4	30	30	23	147	140	167	14	13	14	11	8	12	286	286	282
1	4	084394	2	556	379	7	27	28	20	166	136	157	18	14	11	10	10	12	288	280	278
1	4	084394	2	834	569	11	22	32	23	156	144	156	21	12	18	8	12	15	293	306	313
1	4	084394	2	1112	759	14	32	31	26	143	157	159	11	20	18	10	10	14	273	276	272
1	4	084394	2	1389	949	18	33	36	20	151	150	157	10	10	17	9	8	10	300	292	306
1	4	084394	2	2779	1897	36	26	26	24	160	154	149	10	16	21	10	14	10	287	302	303
1	4	084394	2	5558	3794	71	30	36	29	170	177	181	24	16	19	12	16	15	275	268	272
1	7	084394	3	0	0	0	28	23	20	128	149	156	15	14	20	6	5	7	275	298	278
1	7	084394	3	278	190	3	23	26	26	130	156	143	18	19	20	6	8	6	306	323	308
1	7	084394	3	556	379	7	21	28	24	162	166	150	17	21	13	7	9	10	317	327	329
1	7	084394	3	833	569	10	28	33	26	152	161	146	17	18	16	9	10	8	335	317	336
1	7	084394	3	1111	759	13	24	26	37	136	158	143	21	15	19	7	9	10	330	296	307
1	7	084394	3	1389	948	17	20	24	29	148	161	156	18	14	17	13	10	12	317	298	297
1	7	084394	3	2778	1897	34	22	23	28	177	186	180	12	20	18	14	10	12	324	332	325
1	7	084394	3	5557	3794	67	24	28	36	176	169	187	14	16	13	7	8	6	325	276	281
1	2	084395	1	0	0	0	27	29	20	144	124	150	19	18	14	7	7	9	276	288	272
1	2	084395	1	278	128	4	21	20	29	153	161	146	19	13	8	7	8	6	303	298	298
1	2	084395	1	556	256	8	21	20	23	134	148	153	21	22	23	10	8	8	286	289	299
1	2	084395	1	834	383	12	23	23	22	159	153	164	14	17	12	8	9	7	287	297	286
1	2	084395	1	1112	511	16	28	26	24	144	161	133	14	11	12	8	14	11	268	278	267
1	2	084395	1	1390	639	19	23	24	22	143	162	151	17	16	14	9	12	13	305	294	293
1	2	084395	1	2779	1278	39	29	20	24	147	164	158	11	8	10	15	14	12	293	310	299
1	2	084395	1	5558	2556	78	26	26	27	136	140	152	13	20	17	16	17	19	294	293	296
1	5	084395	2	0	0	0	34	28	20	144	149	142	17	18	8	5	6	7	277	274	266
1	5	084395	2	278	128	4	27	30	27	147	140	167	18	15	19	8	10	9	299	290	293
1	5	084395	2	556	256	8	25	20	25	166	136	157	13	22	12	11	7	14	329	305	334
1	5	084395	2	834	383	12	19	22	25	156	144	156	23	11	13	10	9	11	314	309	313
1	5	084395	2	1112	511	16	23	34	22	170	156	151	12	19	17	15	11	12	294	306	294
1	5	084395	2	1390	639	20	20	28	23	158	148	172	13	20	16	9	12	10	300	282	294
1	5	084395	2	2779	1278	40	21	20	24	168	175	157	15	16	14	11	9	18	326	324	310
1	5	084395	2	5558	2556	80	21	29	21	187	158	168	19	16	18	11	9	13	326	322	312
1	6	084395	3	0	0	0	30	20	20	158	137	144	9	19	15	5	6	7	290	301	301
1	6	084395	3	278	128	4	20	22	21	141	159	138	16	10	20	8	6	9	295	305	302
1	6	084395	3	556	256	7	21	20	26	146	152	134	16	20	12	12	8	10	307	318	318
1	6	084395	3	834	383	11	23	20	20	152	151	136	19	17	15	7	9	7	326	301	310
1	6	084395	3	1111	511	15	28	21	30	144	152	154	8	20	16	6	9	8	286	271	284
1	6	084395	3	1389	639	19	36	20	22	147	166	153	13	16	12	10	8	10	306	311	306
1	6	084395	3	2779	1278	37	20	21	20	153	169	173	21	15	17	10	7	9	306	319	323
1	6	084395	3	5557	2555	74	22	22	20	171	164	184	17	23	20	6	5	7	360	381	370

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)			TA100 (-S9)			TA1535 (-S9)			TA1537 (-S9)			TA102 (-S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
2	4	084454	1	0	0	0	28	26	24	162	178	176	11	7	12	11	11	10	283	281	287
2	4	084454	1	278	247	1	28	21	22	207	188	223	15	11	14	13	12	8	286	271	283
2	4	084454	1	556	494	2	31	27	25	223	221	163	12	11	10	8	9	5	286	296	303
2	4	084454	1	834	741	3	20	27	29	205	187	186	13	15	14	5	5	6	322	296	300
2	4	084454	1	1112	988	4	28	30	31	200	177	174	13	12	11	7	8	7	288	267	274
2	4	084454	1	1389	1235	5	20	24	23	143	159	160	12	10	13	11	13	13	270	278	292
2	4	084454	1	2779	2470	10	29	34	21	132	173	174	11	14	15	7	12	8	291	286	288
2	4	084454	1	5558	4941	20	29	30	32	191	161	174	10	11	12	10	8	8	278	277	292
2	6	084454	2	0	0	0	31	25	26	198	197	136	6	9	12	7	9	7	264	247	256
2	6	084454	2	278	247	1	28	27	31	129	180	177	10	11	14	5	5	5	256	251	263
2	6	084454	2	556	494	2	31	28	34	159	188	178	11	10	12	9	8	8	223	217	241
2	6	084454	2	834	741	3	23	24	21	167	178	177	12	13	16	5	7	5	263	272	292
2	6	084454	2	1111	988	4	29	36	35	186	149	188	16	10	13	9	10	10	273	279	272
2	6	084454	2	1389	1235	5	20	32	27	171	179	181	14	17	10	7	8	8	290	280	288
2	6	084454	2	2779	2470	11	24	32	26	181	111	151	18	12	13	10	9	8	282	266	271
2	6	084454	2	5557	4940	22	24	31	29	168	194	197	13	14	17	9	7	8	292	291	271
2	14	084454	3	0	0	0	21	27	22	172	169	169	9	8	13	5	10	6	317	301	324
2	14	084454	3	278	247	1	22	21	24	190	150	162	11	14	10	7	5	5	312	309	322
2	14	084454	3	556	494	2	21	28	26	177	173	141	12	11	14	11	12	9	313	321	335
2	14	084454	3	834	741	3	27	25	37	139	171	143	14	16	14	13	11	11	343	327	359
2	14	084454	3	1112	988	4	30	26	29	178	184	176	14	16	11	9	9	7	341	348	366
2	14	084454	3	1389	1235	6	22	26	37	197	173	176	18	12	16	7	6	8	381	371	387
2	14	084454	3	2779	2470	11	22	29	26	138	178	194	10	16	14	9	10	10	370	390	390
2	14	084454	3	5558	4941	22	29	27	34	148	144	133	12	10	14	7	9	9	381	358	384
2	5	084455	1	0	0	0	26	20	26	183	NA	178	13	12	17	8	5	7	288	279	286
2	5	084455	1	278	261	2	21	23	25	154	168	157	10	11	13	5	6	6	297	288	293
2	5	084455	1	556	522	3	21	24	20	160	148	150	13	10	6	8	10	11	277	272	282
2	5	084455	1	834	783	5	24	26	29	172	190	174	12	11	8	7	7	8	260	261	276
2	5	084455	1	1112	1044	6	30	32	28	197	194	194	7	6	8	5	10	8	277	299	288
2	5	084455	1	1390	1305	8	37	23	29	201	190	219	8	7	8	7	6	9	319	306	301
2	5	084455	1	2779	2610	15	30	21	29	194	181	186	NA	7	7	7	8	6	288	294	286
2	5	084455	1	5558	5220	31	34	26	37	144	132	162	8	8	7	6	9	8	272	268	277
2	13	084455	2	0	0	0	37	32	27	168	167	160	9	8	7	6	7	10	323	343	338
2	13	084455	2	278	261	1	26	20	24	213	167	158	10	11	12	9	11	14	340	348	372
2	13	084455	2	556	522	3	26	32	27	162	163	183	11	12	14	9	11	14	362	372	386
2	13	084455	2	834	783	4	26	22	27	191	187	178	12	10	13	11	11	9	348	347	350
2	13	084455	2	1112	1044	6	37	29	24	187	226	208	12	16	13	7	7	6	365	357	382
2	13	084455	2	1390	1305	7	26	25	31	206	174	177	10	12	11	5	6	5	378	376	363
2	13	084455	2	2780	2611	15	26	24	30	134	166	142	13	11	12	8	9	7	380	354	360
2	13	084455	2	5559	5222	29	39	32	33	190	203	156	9	12	11	6	10	9	368	351	383
2	17	084455	3	0	0	0	23	22	20	190	168	167	8	9	11	7	9	10	370	351	348
2	17	084455	3	278	261	2	29	24	27	192	154	176	15	12	16	6	5	6	358	352	358
2	17	084455	3	556	522	3	29	25	23	209	222	142	14	19	14	5	7	5	356	371	361
2	17	084455	3	833	783	5	20	22	30	204	189	167	16	14	12	10	7	7	340	364	366
2	17	084455	3	1111	1044	6	29	20	24	181	159	159	13	14	15	8	6	6	373	362	357
2	17	084455	3	1389	1305	8	23	25	28	156	177	162	8	17	16	6	5	7	350	351	342
2	17	084455	3	2778	2609	15	27	30	23	162	152	159	10	13	9	6	7	7	339	354	373
2	17	084455	3	5556	5218	31	28	30	32	141	130	161	16	11	13	7	5	5	370	341	369

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)			TA100 (-S9)			TA1535 (-S9)			TA1537 (-S9)			TA102 (-S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
2	3	084456	1	0	0	0	24	27	20	167	174	122	16	15	12	7	5	8	290	274	269
2	3	084456	1	278	124	3	23	27	28	187	146	132	14	17	13	11	14	8	261	287	279
2	3	084456	1	556	248	6	32	26	33	159	176	190	18	14	15	10	9	9	278	281	266
2	3	084456	1	834	372	10	20	31	39	162	168	176	14	11	14	6	8	7	263	264	279
2	3	084456	1	1112	496	13	28	34	32	180	187	160	13	12	10	12	6	12	290	287	306
2	3	084456	1	1390	620	16	22	28	27	194	184	181	12	15	14	12	9	10	279	280	276
2	3	084456	1	2779	1241	32	26	25	28	203	234	182	12	11	15	9	8	7	287	283	281
2	3	084456	1	5559	2481	65	26	32	27	204	194	169	19	15	17	5	13	11	260	273	291
2	7	084456	2	0	0	0	26	23	28	174	164	194	10	8	11	6	5	5	276	286	272
2	7	084456	2	278	124	3	27	26	22	153	168	190	13	10	11	10	9	8	277	266	253
2	7	084456	2	556	248	7	32	24	31	154	158	189	10	15	12	9	9	11	274	253	251
2	7	084456	2	834	372	10	27	24	33	199	159	166	17	10	12	8	8	10	302	292	288
2	7	084456	2	1112	496	13	24	22	24	173	163	193	8	16	9	7	10	9	286	NA	268
2	7	084456	2	1390	620	17	24	26	31	204	196	203	10	18	11	7	6	6	278	286	293
2	7	084456	2	2779	1240	33	25	27	25	202	164	134	16	15	19	7	8	9	281	273	278
2	7	084456	2	5558	2481	66	29	26	28	141	166	150	13	14	18	5	5	7	303	300	300
2	9	084456	3	0	0	0	26	20	23	138	139	172	10	8	11	7	8	5	294	301	282
2	9	084456	3	278	124	3	27	22	25	157	162	200	13	11	13	9	8	6	311	283	278
2	9	084456	3	556	248	7	26	33	27	193	178	164	15	13	11	7	8	6	289	256	278
2	9	084456	3	834	372	10	28	26	29	155	179	171	11	12	14	8	8	5	286	314	302
2	9	084456	3	1112	496	14	34	30	31	177	174	172	14	13	13	9	5	6	396	362	364
2	9	084456	3	1390	620	17	23	29	28	182	188	176	13	14	10	6	12	6	352	370	331
2	9	084456	3	2780	1241	34	27	24	22	189	162	172	16	18	14	6	9	6	357	369	351
2	9	084456	3	5559	2481	68	23	34	32	173	150	179	16	17	14	9	9	10	365	388	370
2	8	084457	1	0	0	0	37	30	38	174	156	147	6	12	10	6	6	5	287	283	267
2	8	084457	1	278	268	1	27	21	20	149	163	157	14	11	10	7	5	7	266	243	236
2	8	084457	1	556	535	3	31	26	32	117	140	112	9	12	11	5	8	7	263	286	273
2	8	084457	1	833	803	4	27	26	23	82	93	98	14	16	12	5	6	11	282	291	271
2	8	084457	1	1111	1070	6	23	33	26	174	123	162	17	15	11	5	7	6	274	262	253
2	8	084457	1	1389	1338	7	27	32	28	169	172	181	13	18	14	7	5	5	249	234	236
2	8	084457	1	2778	2676	15	32	31	26	182	179	189	9	13	15	5	6	6	248	250	242
2	8	084457	1	5556	5352	29	28	24	27	177	172	193	8	9	14	5	9	6	257	240	246
2	12	084457	2	0	0	0	32	31	28	173	163	177	11	13	10	6	5	8	360	347	342
2	12	084457	2	278	268	2	29	27	28	182	180	178	10	16	10	7	9	6	381	353	349
2	12	084457	2	556	535	3	28	31	24	183	178	176	12	11	15	7	8	6	359	357	372
2	12	084457	2	833	803	5	29	30	33	172	169	183	11	14	13	12	9	11	372	368	368
2	12	084457	2	1111	1070	6	35	25	29	179	153	202	11	14	10	7	7	10	387	366	384
2	12	084457	2	1389	1338	8	29	27	34	193	156	177	17	15	13	7	8	10	367	344	358
2	12	084457	2	2778	2676	15	34	28	36	149	143	164	11	14	11	7	5	5	328	324	346
2	12	084457	2	5556	5351	31	24	32	24	102	117	119	18	17	15	5	6	5	330	319	322
2	15	084457	3	0	0	0	27	30	31	162	160	148	12	12	14	10	9	9	339	365	348
2	15	084457	3	278	268	2	33	31	20	158	197	168	8	16	10	13	10	11	339	338	348
2	15	084457	3	556	535	3	20	24	26	160	158	141	15	19	17	11	11	10	346	361	334
2	15	084457	3	833	803	5	27	21	22	133	159	128	13	8	9	10	10	11	363	367	358
2	15	084457	3	1111	1070	6	24	30	31	148	182	148	8	7	8	5	5	6	342	359	347
2	15	084457	3	1389	1338	8	21	28	27	178	151	146	8	8	7	7	6	8	339	358	356
2	15	084457	3	2778	2676	16	33	24	28	127	127	124	9	7	8	8	6	8	329	341	344
2	15	084457	3	5556	5352	32	38	23	29	82	92	96	21	7	7	12	13	13	342	332	369

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Revertants per plate)**

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)			TA100 (-S9)			TA1535 (-S9)			TA1537 (-S9)			TA102 (-S9)		
							P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
2	2	084458	1	0	0	0	29	27	20	177	163	143	9	11	13	6	6	7	293	289	299
2	2	084458	1	278	264	1	33	24	29	174	191	161	11	14	10	5	5	6	284	297	289
2	2	084458	1	556	527	1	20	22	21	147	134	160	13	11	14	7	5	5	292	282	271
2	2	084458	1	834	791	2	22	27	20	187	160	184	14	16	17	8	7	6	279	276	272
2	2	084458	1	1112	1054	3	31	28	30	158	154	169	16	17	14	7	12	7	252	260	260
2	2	084458	1	1389	1318	3	28	26	27	154	147	168	16	14	18	6	6	12	263	238	264
2	2	084458	1	2779	2636	7	28	21	20	152	133	147	16	15	18	6	10	9	218	228	191
2	2	084458	1	5558	5272	13	30	23	25	149	143	166	16	17	18	6	5	8	186	200	210
2	10	084458	2	0	0	0	23	22	30	180	178	184	8	11	7	11	7	7	302	303	335
2	10	084458	2	278	264	1	30	31	22	183	177	188	10	16	11	6	10	8	362	344	356
2	10	084458	2	556	527	1	22	20	24	172	177	173	14	13	11	6	6	9	379	380	366
2	10	084458	2	834	791	2	28	38	25	149	168	199	10	8	13	8	6	8	374	387	372
2	10	084458	2	1111	1054	3	24	30	33	149	172	154	17	11	16	7	7	9	363	336	342
2	10	084458	2	1389	1318	4	26	27	23	171	164	141	16	13	16	13	10	11	367	337	356
2	10	084458	2	2778	2636	7	32	22	28	144	147	152	17	14	16	7	8	8	336	360	346
2	10	084458	2	5557	5271	14	30	22	33	141	133	119	16	15	17	10	8	11	351	364	374
2	16	084458	3	0	0	0	32	29	39	139	138	171	7	8	10	7	8	8	358	343	343
2	16	084458	3	278	263	1	36	22	21	149	140	138	12	7	11	7	6	7	363	356	361
2	16	084458	3	556	527	2	26	31	29	160	180	166	14	10	15	7	8	7	356	352	348
2	16	084458	3	833	790	2	20	22	27	177	164	87	10	12	10	6	7	6	362	348	367
2	16	084458	3	1111	1054	3	28	21	25	179	138	166	12	9	14	14	12	11	357	328	340
2	16	084458	3	1389	1317	4	34	22	29	188	132	164	9	12	14	7	5	9	333	330	347
2	16	084458	3	2778	2635	8	23	27	30	159	156	161	8	9	12	6	6	8	364	338	342
2	16	084458	3	5556	5270	15	29	27	30	134	117	159	9	15	11	5	7	7	372	358	384

N/A - data not available due to lack of bacterial growth or assay plate contamination

Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)		TA100 (+S9)		TA1535 (+S9)		TA1537 (+S9)		TA102 (+S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	3	084394	1	0	0	0	39	6	147	5	14	4	6	2	300	10
1	3	084394	1	278	190	3	38	6	151	11	9	3	7	1	327	2
1	3	084394	1	556	379	6	38	6	150	17	11	3	10	2	329	2
1	3	084394	1	833	569	10	39	3	156	14	11	3	8	2	339	8
1	3	084394	1	1111	759	13	38	1	158	10	14	3	11	2	352	4
1	3	084394	1	1389	948	16	33	2	144	12	13	4	9	1	347	7
1	3	084394	1	2778	1897	32	34	6	143	2	12	4	15	3	365	9
1	3	084394	1	5556	3793	64	44	4	156	8	12	2	13	3	366	3
1	4	084394	2	0	0	0	30	12	152	10	15	2	6	1	242	20
1	4	084394	2	278	190	4	31	12	143	13	13	1	9	2	241	13
1	4	084394	2	556	379	7	27	11	145	11	13	4	7	2	239	9
1	4	084394	2	834	569	11	30	10	145	2	13	1	9	2	254	5
1	4	084394	2	1112	759	14	40	9	176	9	14	2	9	1	301	2
1	4	084394	2	1389	949	18	36	5	159	15	11	3	11	3	314	12
1	4	084394	2	2779	1897	36	39	2	150	12	13	3	12	2	320	4
1	4	084394	2	5558	3794	71	37	7	160	11	17	3	14	3	295	8
1	7	084394	3	0	0	0	32	2	154	6	11	1	9	1	301	5
1	7	084394	3	278	190	3	30	4	153	9	12	7	10	3	327	3
1	7	084394	3	556	379	7	32	4	160	8	15	1	9	1	329	4
1	7	084394	3	833	569	10	31	4	162	6	13	3	10	2	349	14
1	7	084394	3	1111	759	13	40	5	175	18	12	2	11	4	353	7
1	7	084394	3	1389	948	17	33	6	177	9	10	3	12	1	362	9
1	7	084394	3	2778	1897	34	22	8	173	5	13	1	13	2	328	4
1	7	084394	3	5557	3794	67	27	1	184	12	6	2	16	3	339	6
1	2	084395	1	0	0	0	31	4	157	6	12	4	7	1	302	14
1	2	084395	1	278	128	4	30	11	150	9	14	5	10	1	349	10
1	2	084395	1	556	256	8	27	5	145	13	12	4	12	1	351	6
1	2	084395	1	834	383	12	27	1	162	11	15	2	13	2	365	10
1	2	084395	1	1112	511	16	37	10	168	9	13	4	18	2	359	8
1	2	084395	1	1390	639	19	41	6	144	6	10	6	17	2	353	6
1	2	084395	1	2779	1278	39	37	9	161	1	11	2	18	1	347	16
1	2	084395	1	5558	2556	78	44	4	167	13	15	3	19	1	348	9
1	5	084395	2	0	0	0	42	5	150	15	15	3	8	1	297	9
1	5	084395	2	278	128	4	31	3	137	5	11	4	9	1	312	3
1	5	084395	2	556	256	8	31	1	151	13	13	2	7	1	309	4
1	5	084395	2	834	383	12	34	6	168	14	12	2	11	1	309	9
1	5	084395	2	1112	511	16	39	1	174	6	13	5	11	3	312	12
1	5	084395	2	1390	639	20	41	3	160	9	12	3	10	2	298	7
1	5	084395	2	2779	1278	40	37	2	176	6	13	2	12	2	303	7
1	5	084395	2	5558	2556	80	37	5	214	6	14	2	14	2	333	9
1	6	084395	3	0	0	0	35	5	165	13	10	2	6	1	311	2
1	6	084395	3	278	128	4	25	4	167	17	12	5	7	1	316	1
1	6	084395	3	556	256	7	28	3	168	7	13	4	8	1	314	3
1	6	084395	3	834	383	11	27	5	174	12	10	3	9	1	335	7
1	6	084395	3	1111	511	15	44	4	177	16	10	4	10	2	327	8
1	6	084395	3	1389	639	19	35	4	140	3	12	4	9	2	333	6
1	6	084395	3	2779	1278	37	36	3	153	6	11	3	10	3	338	8
1	6	084395	3	5557	2555	74	42	2	183	6	11	1	12	2	327	7

Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)		TA100 (+S9)		TA1535 (+S9)		TA1537 (+S9)		TA102 (+S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2	4	084454	1	0	0	0	29	3	93	9	15	5	11	3	308	6
2	4	084454	1	278	247	1	28	4	98	3	11	2	6	1	304	9
2	4	084454	1	556	494	2	26	5	104	9	14	4	8	1	289	18
2	4	084454	1	834	741	3	29	3	106	8	9	2	9	2	301	11
2	4	084454	1	1112	988	4	24	3	118	12	13	3	6	1	296	15
2	4	084454	1	1389	1235	5	23	3	117	8	12	3	8	2	316	5
2	4	084454	1	2779	2470	10	28	3	114	7	14	7	12	4	309	15
2	4	084454	1	5558	4941	20	25	3	121	4	15	4	8	1	306	7
2	6	084454	2	0	0	0	25	2	91	5	14	4	10	1	303	14
2	6	084454	2	278	247	1	27	5	92	4	16	3	10	2	307	3
2	6	084454	2	556	494	2	22	1	94	6	17	1	11	2	293	3
2	6	084454	2	834	741	3	21	4	100	9	14	6	8	1	298	6
2	6	084454	2	1111	988	4	24	1	104	5	13	3	10	4	307	12
2	6	084454	2	1389	1235	5	22	2	107	3	17	4	11	1	291	17
2	6	084454	2	2779	2470	11	27	3	119	4	17	4	10	2	277	10
2	6	084454	2	5557	4940	22	26	1	113	2	16	2	9	3	289	9
2	14	084454	3	0	0	0	29	7	95	5	19	2	8	1	303	6
2	14	084454	3	278	247	1	29	5	100	6	15	3	14	1	284	12
2	14	084454	3	556	494	2	22	1	102	7	14	2	6	1	291	16
2	14	084454	3	834	741	3	22	0	103	7	12	5	6	1	291	8
2	14	084454	3	1112	988	4	27	5	112	5	12	2	7	1	289	5
2	14	084454	3	1389	1235	6	22	4	113	9	12	5	8	1	286	3
2	14	084454	3	2779	2470	11	21	2	92	9	12	4	7	2	301	10
2	14	084454	3	5558	4941	22	22	1	100	4	14	3	7	1	294	17
2	5	084455	1	0	0	0	30	6	84	5	12	2	8	2	303	7
2	5	084455	1	278	261	2	22	2	89	4	14	4	12	3	289	9
2	5	084455	1	556	522	3	30	6	91	3	9	1	9	2	297	11
2	5	084455	1	834	783	5	27	6	94	6	9	1	11	2	303	12
2	5	084455	1	1112	1044	6	28	2	106	7	12	1	13	2	304	17
2	5	084455	1	1390	1305	8	22	2	108	9	12	4	10	2	311	14
2	5	084455	1	2779	2610	15	25	5	117	7	10	4	8	2	314	9
2	5	084455	1	5558	5220	31	22	1	100	7	12	2	9	1	314	11
2	13	084455	2	0	0	0	25	7	92	6	15	3	5	1	302	11
2	13	084455	2	278	261	1	22	2	100	6	13	1	7	2	309	3
2	13	084455	2	556	522	3	22	5	102	5	14	4	7	2	292	10
2	13	084455	2	834	783	4	28	10	109	5	15	3	6	1	294	11
2	13	084455	2	1112	1044	6	30	5	122	7	15	4	8	2	294	9
2	13	084455	2	1390	1305	7	25	3	114	7	13	4	6	1	299	10
2	13	084455	2	2780	2611	15	28	2	117	9	12	4	5	1	297	13
2	13	084455	2	5559	5222	29	24	3	108	9	10	4	8	2	310	5
2	17	084455	3	0	0	0	21	1	94	5	12	2	8	1	278	5
2	17	084455	3	278	261	2	23	3	100	5	11	1	9	1	281	5
2	17	084455	3	556	522	3	25	5	103	6	13	3	8	1	282	8
2	17	084455	3	833	783	5	26	5	115	4	15	3	7	1	264	8
2	17	084455	3	1111	1044	6	26	5	104	1	12	2	7	1	274	8
2	17	084455	3	1389	1305	8	23	2	113	7	13	1	6	1	296	12
2	17	084455	3	2778	2609	15	25	4	119	8	16	4	8	1	290	13
2	17	084455	3	5556	5218	31	29	1	114	7	11	2	11	2	290	14

Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)		TA100 (+S9)		TA1535 (+S9)		TA1537 (+S9)		TA102 (+S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2	3	084456	1	0	0	0	29	4	84	3	10	4	8	1	280	11
2	3	084456	1	278	124	3	23	3	88	1	14	3	9	1	271	18
2	3	084456	1	556	248	6	25	5	86	5	14	4	11	2	305	15
2	3	084456	1	834	372	10	25	3	94	7	11	1	8	2	296	2
2	3	084456	1	1112	496	13	21	2	102	8	13	3	13	1	302	19
2	3	084456	1	1390	620	16	30	4	113	8	9	2	11	1	318	13
2	3	084456	1	2779	1241	32	26	3	118	5	10	3	15	1	305	16
2	3	084456	1	5559	2481	65	41	8	102	11	14	4	13	1	330	14
2	7	084456	2	0	0	0	24	6	89	4	16	5	7	2	292	9
2	7	084456	2	278	124	3	22	3	95	5	13	2	8	1	302	5
2	7	084456	2	556	248	7	23	1	100	3	12	1	10	1	305	15
2	7	084456	2	834	372	10	22	2	105	10	17	4	8	2	307	17
2	7	084456	2	1112	496	13	29	5	128	9	12	2	13	2	305	6
2	7	084456	2	1390	620	17	24	1	118	9	14	3	10	2	294	16
2	7	084456	2	2779	1240	33	26	7	108	5	15	5	12	1	288	9
2	7	084456	2	5558	2481	66	38	5	115	8	15	3	11	3	316	4
2	9	084456	3	0	0	0	21	1	91	7	13	5	6	1	291	12
2	9	084456	3	278	124	3	24	5	95	4	12	1	9	1	304	7
2	9	084456	3	556	248	7	20	1	106	3	12	2	9	2	289	3
2	9	084456	3	834	372	10	24	5	107	5	15	7	9	1	293	8
2	9	084456	3	1112	496	14	26	9	112	7	14	3	11	1	277	4
2	9	084456	3	1390	620	17	21	2	118	2	13	4	13	1	311	5
2	9	084456	3	2780	1241	34	24	4	100	4	13	2	8	1	306	18
2	9	084456	3	5559	2481	68	32	4	93	8	12	2	15	2	314	13
2	8	084457	1	0	0	0	23	3	89	4	12	2	7	2	286	11
2	8	084457	1	278	268	1	23	3	101	6	11	2	7	1	296	4
2	8	084457	1	556	535	3	20	3	114	4	12	1	10	2	305	7
2	8	084457	1	833	803	4	25	1	120	4	14	4	12	3	308	9
2	8	084457	1	1111	1070	6	28	5	122	5	13	5	8	0	290	10
2	8	084457	1	1389	1338	7	23	3	103	5	14	4	11	3	312	6
2	8	084457	1	2778	2676	15	24	6	115	9	15	2	6	2	291	6
2	8	084457	1	5556	5352	29	25	3	109	3	18	2	7	3	285	4
2	12	084457	2	0	0	0	27	6	94	4	10	4	6	1	288	9
2	12	084457	2	278	268	2	25	4	96	5	13	3	6	1	293	11
2	12	084457	2	556	535	3	24	5	99	6	13	4	5	0	300	7
2	12	084457	2	833	803	5	22	4	106	7	14	5	7	1	309	9
2	12	084457	2	1111	1070	6	21	2	103	4	11	2	9	1	280	12
2	12	084457	2	1389	1338	8	21	2	109	9	12	5	8	1	281	14
2	12	084457	2	2778	2676	15	21	2	104	9	11	3	7	2	278	22
2	12	084457	2	5556	5351	31	21	2	113	1	17	4	9	2	294	5
2	15	084457	3	0	0	0	31	3	93	6	10	3	9	1	301	8
2	15	084457	3	278	268	2	26	3	97	4	15	4	8	2	299	6
2	15	084457	3	556	535	3	32	4	106	7	12	1	5	1	298	5
2	15	084457	3	833	803	5	25	3	104	2	15	4	12	3	293	12
2	15	084457	3	1111	1070	6	28	5	107	9	11	2	10	1	310	13
2	15	084457	3	1389	1338	8	23	3	110	9	13	7	6	1	297	16
2	15	084457	3	2778	2676	16	26	4	103	7	8	2	7	2	295	9
2	15	084457	3	5556	5352	32	23	3	103	10	8	2	7	1	291	13

Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (+S9)		TA100 (+S9)		TA1535 (+S9)		TA1537 (+S9)		TA102 (+S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2	2	084458	1	0	0	0	25	5	94	8	11	2	10	1	263	8
2	2	084458	1	278	264	1	25	5	101	6	13	2	8	2	260	7
2	2	084458	1	556	527	1	26	0	102	5	12	1	8	3	325	5
2	2	084458	1	834	791	2	23	4	96	4	11	2	11	1	336	15
2	2	084458	1	1112	1054	3	27	9	100	10	14	4	9	3	238	11
2	2	084458	1	1389	1318	3	25	4	107	10	11	2	13	4	202	2
2	2	084458	1	2779	2636	7	26	3	100	8	11	1	11	3	226	10
2	2	084458	1	5558	5272	13	25	3	94	7	14	3	17	5	227	8
2	10	084458	2	0	0	0	24	4	92	2	15	2	7	2	289	8
2	10	084458	2	278	264	1	25	4	96	5	13	3	6	2	292	10
2	10	084458	2	556	527	1	23	6	100	9	9	1	7	3	284	18
2	10	084458	2	834	791	2	25	6	106	9	11	1	6	2	292	14
2	10	084458	2	1111	1054	3	23	5	102	4	8	1	10	3	290	11
2	10	084458	2	1389	1318	4	23	3	102	3	9	1	9	1	300	17
2	10	084458	2	2778	2636	7	21	1	99	6	10	1	7	2	304	5
2	10	084458	2	5557	5271	14	21	1	98	8	12	2	6	1	293	8
2	16	084458	3	0	0	0	21	2	90	6	17	3	8	1	285	14
2	16	084458	3	278	263	1	21	3	95	3	15	3	7	1	285	10
2	16	084458	3	556	527	2	21	1	97	3	14	3	6	1	278	21
2	16	084458	3	833	790	2	22	2	104	7	13	3	5	1	285	8
2	16	084458	3	1111	1054	3	25	3	109	7	13	4	9	1	267	11
2	16	084458	3	1389	1317	4	26	2	112	9	13	3	11	1	258	9
2	16	084458	3	2778	2635	8	32	4	108	3	12	1	6	1	250	14
2	16	084458	3	5556	5270	15	29	3	96	8	12	2	8	1	242	9

*Values represent the mean number of revertants (average of three plates)

Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)		TA100 (-S9)		TA1535 (-S9)		TA1537 (-S9)		TA102 (-S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	3	084394	1	0	0	0	26	5	160	7	10	2	8	1	284	9
1	3	084394	1	278	190	3	28	1	169	4	14	2	11	2	328	9
1	3	084394	1	556	379	6	30	8	155	6	13	2	12	2	296	10
1	3	084394	1	833	569	10	26	2	164	7	17	1	12	2	299	9
1	3	084394	1	1111	759	13	27	6	176	13	14	3	14	1	299	7
1	3	084394	1	1389	948	16	23	2	152	9	17	3	14	2	298	4
1	3	084394	1	2778	1897	32	22	1	153	6	14	3	14	4	304	7
1	3	084394	1	5556	3793	64	27	2	180	2	13	7	16	1	286	2
1	4	084394	2	0	0	0	22	2	147	3	14	3	7	1	282	6
1	4	084394	2	278	190	4	28	4	151	14	14	1	10	2	285	2
1	4	084394	2	556	379	7	25	4	153	15	14	4	11	1	282	5
1	4	084394	2	834	569	11	26	6	152	7	17	5	12	4	304	10
1	4	084394	2	1112	759	14	30	3	153	9	16	5	11	2	274	2
1	4	084394	2	1389	949	18	30	9	153	4	12	4	9	1	299	7
1	4	084394	2	2779	1897	36	25	1	154	6	16	6	11	2	297	9
1	4	084394	2	5558	3794	71	32	4	176	6	20	4	14	2	272	4
1	7	084394	3	0	0	0	24	4	144	15	16	3	6	1	284	13
1	7	084394	3	278	190	3	25	2	143	13	19	1	7	1	312	9
1	7	084394	3	556	379	7	24	4	159	8	17	4	9	2	324	6
1	7	084394	3	833	569	10	29	4	153	8	17	1	9	1	329	11
1	7	084394	3	1111	759	13	29	7	146	11	18	3	9	2	311	17
1	7	084394	3	1389	948	17	24	5	155	7	16	2	12	2	304	11
1	7	084394	3	2778	1897	34	24	3	181	5	17	4	12	2	327	4
1	7	084394	3	5557	3794	67	29	6	177	9	14	2	7	1	294	27
1	2	084395	1	0	0	0	25	5	139	14	17	3	8	1	279	8
1	2	084395	1	278	128	4	23	5	153	8	13	6	7	1	300	3
1	2	084395	1	556	256	8	21	2	145	10	22	1	9	1	291	7
1	2	084395	1	834	383	12	23	1	159	6	14	3	8	1	290	6
1	2	084395	1	1112	511	16	26	2	146	14	12	2	11	3	271	6
1	2	084395	1	1390	639	19	23	1	152	10	16	2	11	2	297	7
1	2	084395	1	2779	1278	39	24	5	156	9	10	2	14	2	301	9
1	2	084395	1	5558	2556	78	26	1	143	8	17	4	17	2	294	2
1	5	084395	2	0	0	0	27	7	145	4	14	6	6	1	272	6
1	5	084395	2	278	128	4	28	2	151	14	17	2	9	1	294	5
1	5	084395	2	556	256	8	23	3	153	15	16	6	11	4	323	16
1	5	084395	2	834	383	12	22	3	152	7	16	6	10	1	312	3
1	5	084395	2	1112	511	16	26	7	159	10	16	4	13	2	298	7
1	5	084395	2	1390	639	20	24	4	159	12	16	4	10	2	292	9
1	5	084395	2	2779	1278	40	22	2	167	9	15	1	13	5	320	9
1	5	084395	2	5558	2556	80	24	5	171	15	18	2	11	2	320	7
1	6	084395	3	0	0	0	23	6	146	11	14	5	6	1	297	6
1	6	084395	3	278	128	4	21	1	146	11	15	5	8	2	301	5
1	6	084395	3	556	256	7	22	3	144	9	16	4	10	2	314	6
1	6	084395	3	834	383	11	21	2	146	9	17	2	8	1	312	13
1	6	084395	3	1111	511	15	26	5	150	5	15	6	8	2	280	8
1	6	084395	3	1389	639	19	26	9	155	10	14	2	9	1	308	3
1	6	084395	3	2779	1278	37	20	1	165	11	18	3	9	2	316	9
1	6	084395	3	5557	2555	74	21	1	173	10	20	3	6	1	370	11

Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)		TA100 (-S9)		TA1535 (-S9)		TA1537 (-S9)		TA102 (-S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2	4	084454	1	0	0	0	26	2	172	9	10	3	11	1	284	3
2	4	084454	1	278	247	1	24	4	206	18	13	2	11	3	280	8
2	4	084454	1	556	494	2	28	3	202	34	11	1	7	2	295	9
2	4	084454	1	834	741	3	25	5	193	11	14	1	5	1	306	14
2	4	084454	1	1112	988	4	30	2	184	14	12	1	7	1	276	11
2	4	084454	1	1389	1235	5	22	2	154	10	12	2	12	1	280	11
2	4	084454	1	2779	2470	10	28	7	160	24	13	2	9	3	288	3
2	4	084454	1	5558	4941	20	30	2	175	15	11	1	9	1	282	8
2	6	084454	2	0	0	0	27	3	177	36	9	3	8	1	256	9
2	6	084454	2	278	247	1	29	2	162	29	12	2	5	0	257	6
2	6	084454	2	556	494	2	31	3	175	15	11	1	8	1	227	12
2	6	084454	2	834	741	3	23	2	174	6	14	2	6	1	276	15
2	6	084454	2	1111	988	4	33	4	174	22	13	3	10	1	275	4
2	6	084454	2	1389	1235	5	26	6	177	5	14	4	8	1	286	5
2	6	084454	2	2779	2470	11	27	4	148	35	14	3	9	1	273	8
2	6	084454	2	5557	4940	22	28	4	186	16	15	2	8	1	285	12
2	14	084454	3	0	0	0	23	3	170	2	10	3	7	3	314	12
2	14	084454	3	278	247	1	22	2	167	21	12	2	6	1	314	7
2	14	084454	3	556	494	2	25	4	164	20	12	2	11	2	323	11
2	14	084454	3	834	741	3	30	6	151	17	15	1	12	1	343	16
2	14	084454	3	1112	988	4	28	2	179	4	14	3	8	1	352	13
2	14	084454	3	1389	1235	6	28	8	182	13	15	3	7	1	380	8
2	14	084454	3	2779	2470	11	26	4	170	29	13	3	10	1	383	12
2	14	084454	3	5558	4941	22	30	4	142	8	12	2	8	1	374	14
2	5	084455	1	0	0	0	24	3	181	4	14	3	7	2	284	5
2	5	084455	1	278	261	2	23	2	160	7	11	2	6	1	293	5
2	5	084455	1	556	522	3	22	2	153	6	10	4	10	2	277	5
2	5	084455	1	834	783	5	26	3	179	10	10	2	7	1	266	9
2	5	084455	1	1112	1044	6	30	2	195	2	7	1	8	3	288	11
2	5	084455	1	1390	1305	8	30	7	203	15	8	1	7	2	309	9
2	5	084455	1	2779	2610	15	27	5	187	7	7	0	7	1	289	4
2	5	084455	1	5558	5220	31	32	6	146	15	8	1	8	2	272	5
2	13	084455	2	0	0	0	32	5	165	4	8	1	8	2	335	10
2	13	084455	2	278	261	1	23	3	179	30	11	1	11	3	353	17
2	13	084455	2	556	522	3	28	3	169	12	12	2	11	3	373	12
2	13	084455	2	834	783	4	25	3	185	7	12	2	10	1	348	2
2	13	084455	2	1112	1044	6	30	7	207	20	14	2	7	1	368	13
2	13	084455	2	1390	1305	7	27	3	186	18	11	1	5	1	372	8
2	13	084455	2	2780	2611	15	27	3	147	17	12	1	8	1	365	14
2	13	084455	2	5559	5222	29	35	4	183	24	11	2	8	2	367	16
2	17	084455	3	0	0	0	22	2	175	13	9	2	9	2	356	12
2	17	084455	3	278	261	2	27	3	174	19	14	2	6	1	356	3
2	17	084455	3	556	522	3	26	3	191	43	16	3	6	1	363	8
2	17	084455	3	833	783	5	24	5	187	19	14	2	8	2	357	14
2	17	084455	3	1111	1044	6	24	5	166	13	14	1	7	1	364	8
2	17	084455	3	1389	1305	8	25	3	165	11	14	5	6	1	348	5
2	17	084455	3	2778	2609	15	27	4	158	5	11	2	7	1	355	17
2	17	084455	3	5556	5218	31	30	2	144	16	13	3	6	1	360	16

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Average No. of Revertants per plate)***

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)		TA100 (-S9)		TA1535 (-S9)		TA1537 (-S9)		TA102 (-S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2	3	084456	1	0	0	0	24	4	154	28	14	2	7	2	278	11
2	3	084456	1	278	124	3	26	3	155	29	15	2	11	3	276	13
2	3	084456	1	556	248	6	30	4	175	16	16	2	9	1	275	8
2	3	084456	1	834	372	10	30	10	169	7	13	2	7	1	269	9
2	3	084456	1	1112	496	13	31	3	176	14	12	2	10	3	294	10
2	3	084456	1	1390	620	16	26	3	186	7	14	2	10	2	278	2
2	3	084456	1	2779	1241	32	26	2	206	26	13	2	8	1	284	3
2	3	084456	1	5559	2481	65	28	3	189	18	17	2	10	4	275	16
2	7	084456	2	0	0	0	26	3	177	15	10	2	5	1	278	7
2	7	084456	2	278	124	3	25	3	170	19	11	2	9	1	265	12
2	7	084456	2	556	248	7	29	4	167	19	12	3	10	1	259	13
2	7	084456	2	834	372	10	28	5	175	21	13	4	9	1	294	7
2	7	084456	2	1112	496	13	23	1	176	15	11	4	9	2	277	13
2	7	084456	2	1390	620	17	27	4	201	4	13	4	6	1	286	8
2	7	084456	2	2779	1240	33	26	1	167	34	17	2	8	1	277	4
2	7	084456	2	5558	2481	66	28	2	152	13	15	3	6	1	301	2
2	9	084456	3	0	0	0	23	3	150	19	10	2	7	2	292	10
2	9	084456	3	278	124	3	25	3	173	24	12	1	8	2	291	18
2	9	084456	3	556	248	7	29	4	178	15	13	2	7	1	274	17
2	9	084456	3	834	372	10	28	2	168	12	12	2	7	2	301	14
2	9	084456	3	1112	496	14	32	2	174	3	13	1	7	2	374	19
2	9	084456	3	1390	620	17	27	3	182	6	12	2	8	3	351	20
2	9	084456	3	2780	1241	34	24	3	174	14	16	2	7	2	359	9
2	9	084456	3	5559	2481	68	30	6	167	15	16	2	9	1	374	12
2	8	084457	1	0	0	0	35	4	159	14	9	3	6	1	279	11
2	8	084457	1	278	268	1	23	4	156	7	12	2	6	1	248	16
2	8	084457	1	556	535	3	30	3	123	15	11	2	7	2	274	12
2	8	084457	1	833	803	4	25	2	91	8	14	2	7	3	281	10
2	8	084457	1	1111	1070	6	27	5	153	27	14	3	6	1	263	11
2	8	084457	1	1389	1338	7	29	3	174	6	15	3	6	1	240	8
2	8	084457	1	2778	2676	15	30	3	183	5	12	3	6	1	247	4
2	8	084457	1	5556	5352	29	26	2	181	11	10	3	7	2	248	9
2	12	084457	2	0	0	0	30	2	171	7	11	2	6	2	350	9
2	12	084457	2	278	268	2	28	1	180	2	12	3	7	2	361	17
2	12	084457	2	556	535	3	28	4	179	4	13	2	7	1	363	8
2	12	084457	2	833	803	5	31	2	175	7	13	2	11	2	369	2
2	12	084457	2	1111	1070	6	30	5	178	25	12	2	8	2	379	11
2	12	084457	2	1389	1338	8	30	4	175	19	15	2	8	2	356	12
2	12	084457	2	2778	2676	15	33	4	152	11	12	2	6	1	333	12
2	12	084457	2	5556	5351	31	27	5	113	9	17	2	5	1	324	6
2	15	084457	3	0	0	0	29	2	157	8	13	1	9	1	351	13
2	15	084457	3	278	268	2	28	7	174	20	11	4	11	2	342	6
2	15	084457	3	556	535	3	23	3	153	10	17	2	11	1	347	14
2	15	084457	3	833	803	5	23	3	140	17	10	3	10	1	363	5
2	15	084457	3	1111	1070	6	28	4	159	20	8	1	5	1	349	9
2	15	084457	3	1389	1338	8	25	4	158	17	8	1	7	1	351	10
2	15	084457	3	2778	2676	16	28	5	126	2	8	1	7	1	338	8
2	15	084457	3	5556	5352	32	30	8	90	7	12	8	13	1	348	19

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Average No. of Revertants per plate)***

Set Number	Run Number	Sample ID	Replicate Number	ST Dose (µg/plate)	ST-H ₂ O Dose (µg/plate)	Nicotine Dose (µg/plate)	TA98 (-S9)		TA100 (-S9)		TA1535 (-S9)		TA1537 (-S9)		TA102 (-S9)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2	2	084458	1	0	0	0	25	5	161	17	11	2	6	1	294	5
2	2	084458	1	278	264	1	29	5	175	15	12	2	5	1	290	7
2	2	084458	1	556	527	1	21	1	147	13	13	2	6	1	282	11
2	2	084458	1	834	791	2	23	4	177	15	16	2	7	1	276	4
2	2	084458	1	1112	1054	3	30	2	160	8	16	2	9	3	257	5
2	2	084458	1	1389	1318	3	27	1	156	11	16	2	8	3	255	15
2	2	084458	1	2779	2636	7	23	4	144	10	16	2	8	2	212	19
2	2	084458	1	5558	5272	13	26	4	153	12	17	1	6	2	199	12
2	10	084458	2	0	0	0	25	4	181	3	9	2	8	2	313	19
2	10	084458	2	278	264	1	28	5	183	6	12	3	8	2	354	9
2	10	084458	2	556	527	1	22	2	174	3	13	2	7	2	375	8
2	10	084458	2	834	791	2	30	7	172	25	10	3	7	1	378	8
2	10	084458	2	1111	1054	3	29	5	158	12	15	3	8	1	347	14
2	10	084458	2	1389	1318	4	25	2	159	16	15	2	11	2	353	15
2	10	084458	2	2778	2636	7	27	5	148	4	16	2	8	1	347	12
2	10	084458	2	5557	5271	14	28	6	131	11	16	1	10	2	363	12
2	16	084458	3	0	0	0	33	5	149	19	8	2	8	1	348	9
2	16	084458	3	278	263	1	26	8	142	6	10	3	7	1	360	4
2	16	084458	3	556	527	2	29	3	169	10	13	3	7	1	352	4
2	16	084458	3	833	790	2	23	4	143	49	11	1	6	1	359	10
2	16	084458	3	1111	1054	3	25	4	161	21	12	3	12	2	342	15
2	16	084458	3	1389	1317	4	28	6	161	28	12	3	7	2	337	9
2	16	084458	3	2778	2635	8	27	4	159	3	10	2	7	1	348	14
2	16	084458	3	5556	5270	15	29	2	137	21	12	3	6	1	371	13

*Values represent the mean number of revertants (average of three plates)

**Mutagenesis in *Salmonella typhimurium* with (+) and without (-) S9 Metabolic Activation
(Date of assay)**

Set Number	Run Number	Sample ID	Replicate Number	TA98		TA100		TA1535		TA1537		TA102	
				+S9	-S9	+S9	-S9	+S9	-S9	+S9	-S9	+S9	-S9
1	3	084394	1	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
1	4	084394	2	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
1	7	084394	3	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
1	2	084395	1	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
1	5	084395	2	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
1	6	084395	3	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
2	4	084454	1	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	6	084454	2	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	14	084454	3	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	5	084455	1	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	13	084455	2	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	17	084455	3	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	3	084456	1	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	7	084456	2	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	9	084456	3	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	8	084457	1	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	12	084457	2	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	15	084457	3	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	2	084458	1	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	10	084458	2	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08
2	16	084458	3	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08

Sample ID	Sample Description
control	Kentucky Reference 3R4F

LABSTAT INTERNATIONAL ULC

262 Manitou Drive, Kitchener, Ontario, Canada N2C 1L3

Phone (519) 748-5409 FAX (519) 748-1654

Project: M97

Period: September 19 - 26, 2008

**Positive and Negative Control Colony Counts for Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Revertants per plate)**

Control Substance	Assay Date	Concentration (µg/plate)	TA98 (+S9)			TA100 (+S9)			TA1535 (+S9)			TA1537 (+S9)			TA102 (+S9)		
			P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
Negative Control (-)	19-Sep-08		34	30	30	151	140	141							290	274	297
	23-Sep-08								13	13	16	12	13	12			
	23-Sep-08											5	7	9			
	24-Sep-08		20	23	21				8	10	12						
	26-Sep-08					86	76	103							235	236	244
Positive Control (+)																	
2-aminoanthracene	19-Sep-08	2	1630	1680	1610	1630	1610	1610									
	24-Sep-08	2	1290	1250	1200												
	26-Sep-08	2				1408	1655	1558									
2-aminoanthracene	23-Sep-08	4							312	304	312	406	415	369			
	23-Sep-08	4										301	302	367			
	24-Sep-08	4							292	312	303						
2-aminoanthracene	19-Sep-08	7.5													1550	1638	1496
	26-Sep-08	7.5													1642	1674	1550

+S9 Controls

Revision: 0

SST-284-07

Labstat International ULC

LABSTAT INTERNATIONAL ULC

262 Manitou Drive, Kitchener, Ontario, Canada N2C 1L3

Phone (519) 748-5409 FAX (519) 748-1654

Project: M97

Period: September 19 - 26, 2008

**Positive and Negative Control Colony Counts for Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Revertants per plate)**

Control Substance	Assay Date	Concentration (µg/plate)	TA98 (-S9)			TA100 (-S9)			TA1535 (-S9)			TA1537 (-S9)			TA102 (-S9)		
			P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
Negative Control (-)	19-Sep-08		29	29	21	160	164	148							287	274	307
	23-Sep-08								18	16	11	8	9	11			
	24-Sep-08								14	12	16	7	7	5			
	26-Sep-08		21	28	26	141	129	182							249	240	254
Positive Control (+)																	
Sodium Azide	19-Sep-08	1				781	760	778									
	23-Sep-08	1							624	630	658						
	24-Sep-08	1							515	645	617						
	26-Sep-08	1				474	491	476									
9-aminoacridine	23-Sep-08	100										569	532	524			
	24-Sep-08	100										653	533	644			
2-nitrofluorene	19-Sep-08	4	1190	936	1000												
	26-Sep-08	4	908	899	917												
Mitomycin C	19-Sep-08	0.5													1334	1307	1388
	26-Sep-08	0.5													1210	1240	1390

-S9 Controls

Revision: 0

SST-284-07

Labstat International ULC

LABSTAT INTERNATIONAL ULC

262 Manitou Drive, Kitchener, Ontario, Canada N2C 1L3
 Phone (519) 748-5409 FAX (519) 748-1654

Project: M97

Period: September 19 - 26, 2008

Positive and Negative Control Colony Counts for Mutagenesis in *Salmonella typhimurium*
(Average Number of Revertants per plate)

Strain	Assay Date	S9 Metabolic Activation	Control Substance	Dose (µg/plate)	Average Revertants	Acceptance Criteria
Positive Control *						
TA98	19-Sep-08	+S9	2-aminoanthracene	2	1640	PASS
TA98	24-Sep-08	+S9	2-aminoanthracene	2	1247	PASS
TA98	19-Sep-08	-S9	2-nitrofluorene	4	1042	PASS
TA98	26-Sep-08	-S9	2-nitrofluorene	4	908	PASS
TA100	19-Sep-08	+S9	2-aminoanthracene	2	1617	PASS
TA100	26-Sep-08	+S9	2-aminoanthracene	2	1540	PASS
TA100	19-Sep-08	-S9	sodium azide	1	773	PASS
TA100	26-Sep-08	-S9	sodium azide	1	480	PASS
TA1535	23-Sep-08	+S9	2-aminoanthracene	4	309	PASS
TA1535	24-Sep-08	+S9	2-aminoanthracene	4	302	PASS
TA1535	23-Sep-08	-S9	Sodium Azide	1	637	PASS
TA1535	24-Sep-08	-S9	Sodium Azide	1	592	PASS
TA1537	23-Sep-08	+S9	2-aminoanthracene	4	397	PASS
TA1537	23-Sep-08	+S9	2-aminoanthracene	4	323	PASS
TA1537	23-Sep-08	-S9	9-aminoacridine	100	542	PASS
TA1537	24-Sep-08	-S9	9-aminoacridine	100	610	PASS
TA102	19-Sep-08	+S9	2-aminoanthracene	7.5	1561	PASS
TA102	26-Sep-08	+S9	2-aminoanthracene	7.5	1622	PASS
TA102	19-Sep-08	-S9	Mitomycin C	0.5	1343	PASS
TA102	26-Sep-08	-S9	Mitomycin C	0.5	1280	PASS
Negative Control **						
TA98	19-Sep-08	+S9	none	N/A	31	PASS
TA98	24-Sep-08	+S9	none	N/A	21	PASS
TA98	19-Sep-08	-S9	none	N/A	26	PASS
TA98	26-Sep-08	-S9	none	N/A	25	PASS
TA100	19-Sep-08	+S9	none	N/A	144	PASS
TA100	26-Sep-08	+S9	none	N/A	88	PASS
TA100	19-Sep-08	-S9	none	N/A	157	PASS
TA100	26-Sep-08	-S9	none	N/A	151	PASS
TA1535	23-Sep-08	+S9	none	N/A	14	PASS
TA1535	24-Sep-08	+S9	none	N/A	10	PASS
TA1535	23-Sep-08	-S9	none	N/A	15	PASS
TA1535	24-Sep-08	-S9	none	N/A	14	PASS
TA1537	23-Sep-08	+S9	none	N/A	12	PASS
TA1537	23-Sep-08	+S9	none	N/A	7	PASS
TA1537	23-Sep-08	-S9	none	N/A	9	PASS
TA1537	24-Sep-08	-S9	none	N/A	6	PASS
TA102	19-Sep-08	+S9	none	N/A	287	PASS
TA102	26-Sep-08	+S9	none	N/A	238	PASS
TA102	19-Sep-08	-S9	none	N/A	289	PASS
TA102	26-Sep-08	-S9	none	N/A	248	PASS

* **Positive Controls:** Each mean positive control value must exhibit at least a three-fold increase over the respective mean negative control value for each tester strain.

** **Negative Controls:** mean reverents per plate must be within the listed ranges.

**Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Revertants per plate)**

Sample ID	Replicate Number	TPM Dose (µg/plate)	TA98 (+S9)			TA100 (+S9)			TA1535 (+S9)			TA1537 (+S9)			TA102 (+S9)		
			P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
control	1	0	42	22	40	125	131	151	8	13	12	7	6	9	283	302	318
control	1	25	53	70	62	137	131	134	12	9	8	11	14	16	306	316	352
control	1	50	97	110	107	167	151	138	10	10	11	22	23	20	350	349	318
control	1	75	161	143	154	167	158	182	10	6	11	22	28	23	337	349	340
control	1	100	170	164	164	180	200	168	12	7	7	31	27	35	358	340	NA
control	1	125	182	178	172	196	190	197	6	8	8	33	37	33	NA	353	340
control	1	250	260	239	238	220	189	220	8	10	13	52	62	46	357	373	353
control	1	500	445	447	481	309	342	316	15	8	10	84	101	94	385	369	373
control	2	0	33	20	20	83	95	81	11	9	16	9	8	6	295	313	302
control	2	25	40	46	33	95	106	81	18	13	14	14	12	12	311	321	320
control	2	50	83	72	94	117	110	96	12	17	10	18	19	21	318	330	315
control	2	75	108	83	101	114	130	107	10	13	9	21	27	21	318	314	333
control	2	100	144	138	151	138	126	116	17	13	9	30	33	31	344	315	326
control	2	125	208	206	227	NA	124	130	16	11	9	36	37	34	324	342	330
control	2	250	357	362	359	141	152	139	23	13	17	61	64	65	304	339	332
control	2	500	521	517	541	142	155	164	28	12	13	88	85	90	348	358	356

N/A - data not available due to lack of bacterial growth or assay plate contamination

**Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Revertants per plate)**

Sample ID	Replicate Number	TPM Dose (µg/plate)	TA98 (-S9)			TA100 (-S9)			TA1535 (-S9)			TA1537 (-S9)			TA102 (-S9)		
			P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
control	1	0	23	29	23	156	129	139	16	20	17	8	6	8	298	296	291
control	1	25	22	26	24	156	141	157	13	18	12	9	10	13	299	310	300
control	1	50	38	34	33	166	162	148	11	11	8	11	14	12	279	289	296
control	1	75	37	27	31	163	158	179	16	11	16	11	9	12	298	314	296
control	1	100	30	28	21	182	177	170	14	13	18	9	11	12	310	294	285
control	1	125	20	27	27	193	160	170	12	12	16	9	18	13	293	291	303
control	1	250	37	33	31	184	178	151	14	19	15	10	11	10	268	286	262
control	1	500	62	50	59	164	159	177	24	26	19	13	16	15	266	268	239
control	2	0	24	23	25	187	171	161	9	12	13	7	7	8	264	272	264
control	2	25	23	28	29	153	154	152	15	9	11	12	8	7	279	279	267
control	2	50	31	39	36	179	160	163	8	14	9	9	6	6	271	284	273
control	2	75	31	35	23	196	159	188	9	14	12	10	9	9	256	264	257
control	2	100	38	33	37	196	172	216	14	11	14	11	8	5	278	298	290
control	2	125	28	35	29	180	174	172	12	13	11	6	8	8	264	262	257
control	2	250	48	40	43	167	171	180	12	11	13	9	12	11	251	231	233
control	2	500	58	62	63	104	116	133	13	17	18	7	6	5	249	252	277

Mutagenesis in *Salmonella typhimurium* with (+) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Sample ID	Replicate Number	TPM Dose (µg/plate)	TA98 (+S9)		TA100 (+S9)		TA1535 (+S9)		TA1537 (+S9)		TA102 (+S9)	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
control	1	0	35	11	136	14	11	3	7	2	301	18
control	1	25	62	9	134	3	10	2	14	3	325	24
control	1	50	105	7	152	15	10	1	22	2	339	18
control	1	75	153	9	169	12	9	3	24	3	342	6
control	1	100	166	3	183	16	9	3	31	4	349	13
control	1	125	177	5	194	4	7	1	34	2	347	9
control	1	250	246	12	210	18	10	3	53	8	361	11
control	1	500	458	20	322	17	11	4	93	9	376	8
control	2	0	24	8	86	8	12	4	8	2	303	9
control	2	25	40	7	94	13	15	3	13	1	317	6
control	2	50	83	11	108	11	13	4	19	2	321	8
control	2	75	97	13	117	12	11	2	23	3	322	10
control	2	100	144	7	127	11	13	4	31	2	328	15
control	2	125	214	12	127	4	12	4	36	2	332	9
control	2	250	359	3	144	7	18	5	63	2	325	19
control	2	500	526	13	154	11	18	9	88	3	354	5

*Values represent the mean number of revertants (average of three plates)

Mutagenesis in *Salmonella typhimurium* without (-) S9 Metabolic Activation
(Average No. of Revertants per plate)*

Sample ID	Replicate Number	TPM Dose (µg/plate)	TA98 (-S9)		TA100 (-S9)		TA1535 (-S9)		TA1537 (-S9)		TA102 (-S9)	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
control	1	0	25	3	141	14	18	2	7	1	295	4
control	1	25	24	2	151	9	14	3	11	2	303	6
control	1	50	35	3	159	9	10	2	12	2	288	9
control	1	75	32	5	167	11	14	3	11	2	303	10
control	1	100	26	5	176	6	15	3	11	2	296	13
control	1	125	25	4	174	17	13	2	13	5	296	6
control	1	250	34	3	171	18	16	3	10	1	272	12
control	1	500	57	6	167	9	23	4	15	2	258	16
control	2	0	24	1	173	13	11	2	7	1	267	5
control	2	25	27	3	153	1	12	3	9	3	275	7
control	2	50	35	4	167	10	10	3	7	2	276	7
control	2	75	30	6	181	19	12	3	9	1	259	4
control	2	100	36	3	195	22	13	2	8	3	289	10
control	2	125	31	4	175	4	12	1	7	1	261	4
control	2	250	44	4	173	7	12	1	11	2	238	11
control	2	500	61	3	118	15	16	3	6	1	259	15

*Values represent the mean number of revertants (average of three plates)

Mutagenesis in *Salmonella typhimurium* with (+) and without (-) S9 Metabolic Activation
(Date of assay)

Sample ID	Replicate Number	TA98		TA100		TA1535		TA1537		TA102	
		+S9	-S9	+S9	-S9	+S9	-S9	+S9	-S9	+S9	-S9
control	1	19-Sep-08	19-Sep-08	19-Sep-08	19-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	23-Sep-08	19-Sep-08	19-Sep-08
control	2	24-Sep-08	26-Sep-08	26-Sep-08	26-Sep-08	24-Sep-08	24-Sep-08	23-Sep-08	24-Sep-08	26-Sep-08	26-Sep-08

LABSTAT INTERNATIONAL ULC

262 Manitou Drive, Kitchener, Ontario, Canada N2C 1L3

Phone (519) 748-5409 FAX (519) 748-1654

Project: M97

Period: September 19 - 26, 2008

Control: Kentucky Reference 3R4F

Comparison of Internal KR 3R4F Control Slopes with Expected (Historical) Slopes (Mainstream Tobacco Smoke 'Intense' Conditions *)

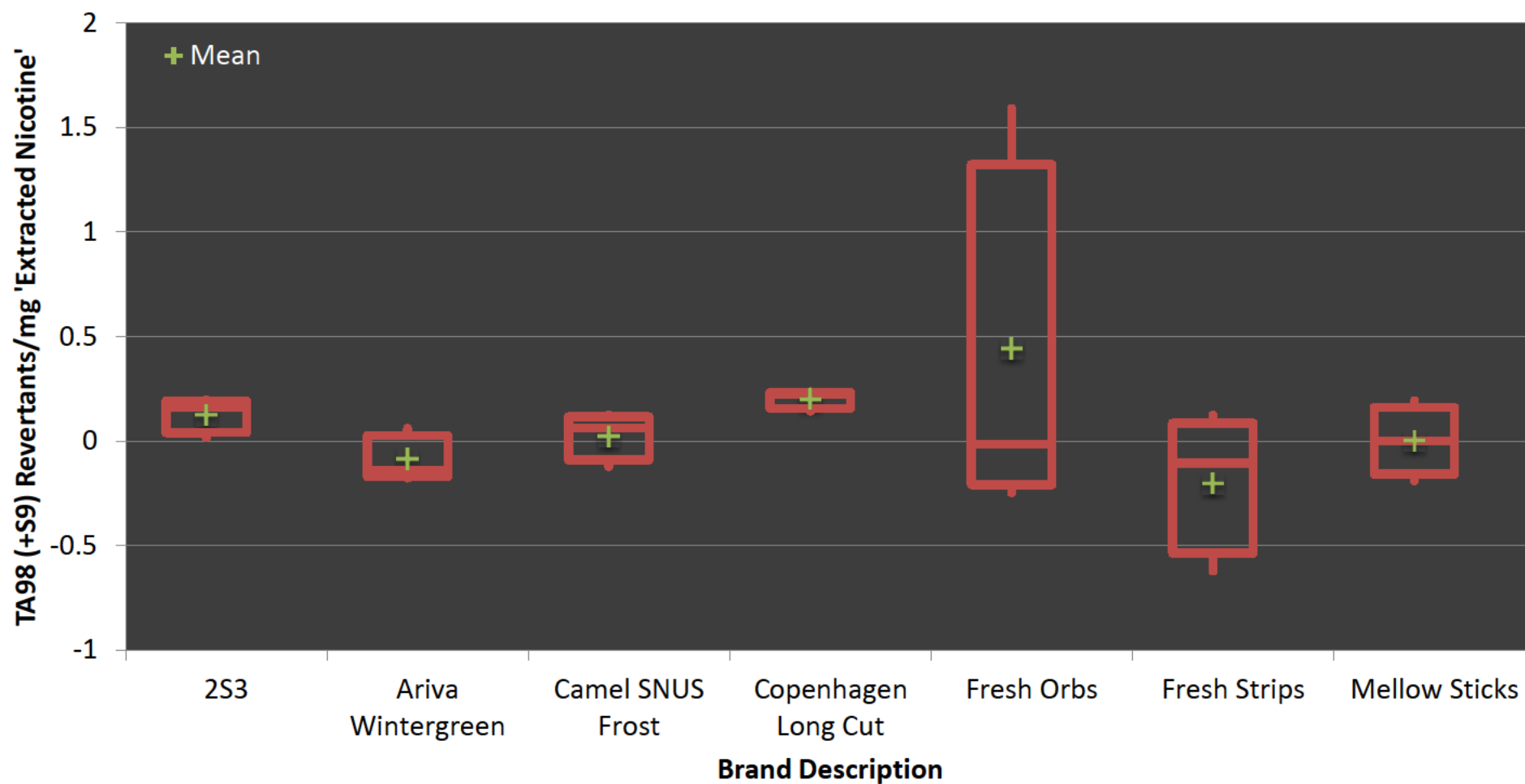
Strain	Assay Date	Target Slope		Unit	This Study Slope	Z Score	P Value
		Average	Std Dev				
TA98 (+S9)	19-Sep-08	1399	202	(rev./mg TPM)	1228	0.847	0.397
TA98 (+S9)	24-Sep-08	1399	202	(rev./mg TPM)	1457	-0.289	0.773
TA98 (-S9)	19-Sep-08	47.3	30.2	(rev./mg TPM)	24	0.783	0.434
TA98 (-S9)	26-Sep-08	47.3	30.2	(rev./mg TPM)	69	-0.716	0.474
TA100 (+S9)	19-Sep-08	580	148	(rev./mg TPM)	522	0.395	0.693
TA100 (+S9)	26-Sep-08	580	148	(rev./mg TPM)	367	1.444	0.149
TA100 (-S9)	19-Sep-08	189	76	(rev./mg TPM)	283	-1.238	0.216
TA100 (-S9)	26-Sep-08	189	76	(rev./mg TPM)	172	0.221	0.825
TA102 (+S9)	19-Sep-08	444	171	(rev./mg TPM)	366	0.459	0.646
TA102 (+S9)	26-Sep-08	444	171	(rev./mg TPM)	202	1.414	0.157
TA102 (-S9)	19-Sep-08	102	112	(rev./mg TPM)	0	0.912	0.362
TA102 (-S9)	26-Sep-08	102	112	(rev./mg TPM)	0	0.912	0.362
TA1535 (+S9)	23-Sep-08	13.5	14.1	(rev./mg TPM)	0	0.955	0.339
TA1535 (+S9)	24-Sep-08	13.5	14.1	(rev./mg TPM)	17	-0.268	0.789
TA1535 (-S9)	23-Sep-08	10.9	13.7	(rev./mg TPM)	0	0.797	0.425
TA1535 (-S9)	24-Sep-08	10.9	13.7	(rev./mg TPM)	0	0.797	0.425
TA1537 (+S9)	23-Sep-08	225	42	(rev./mg TPM)	217	0.192	0.848
TA1537 (+S9)	23-Sep-08	225	42	(rev./mg TPM)	228	-0.078	0.938
TA1537 (-S9)	23-Sep-08	23.8	14.9	(rev./mg TPM)	0	1.596	0.110
TA1537 (-S9)	24-Sep-08	23.8	14.9	(rev./mg TPM)	10	0.911	0.362

* internal control samples generated under 'Intense' smoking conditions:
55mL puff volume; 30 second interval; 2 second duration; 100% vent blocking.

Test Describe - Comparative

Performed by TA98 (+S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

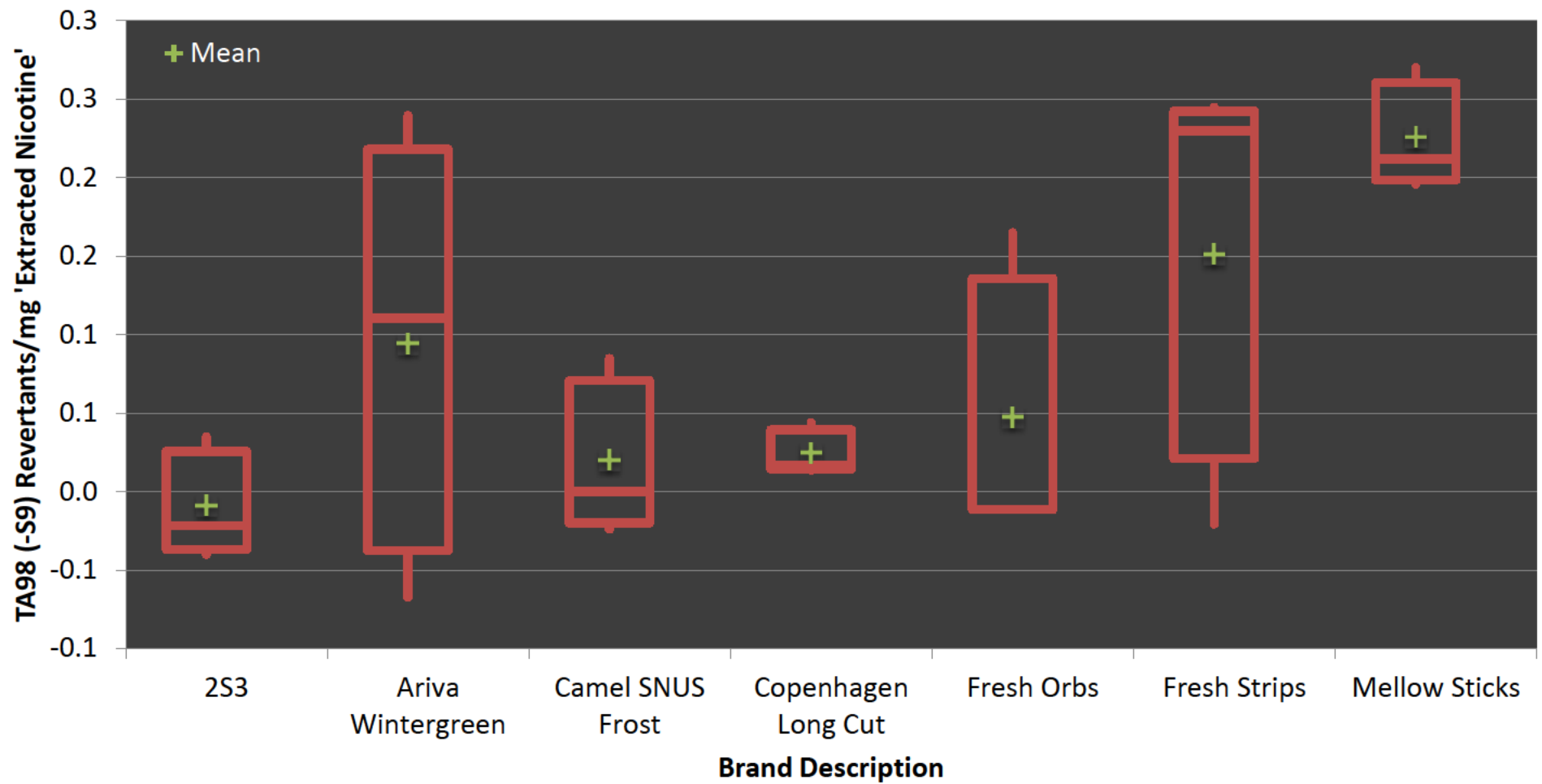
Date 26 October 2009



Test Describe - Comparative

Performed by TA98 (-S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

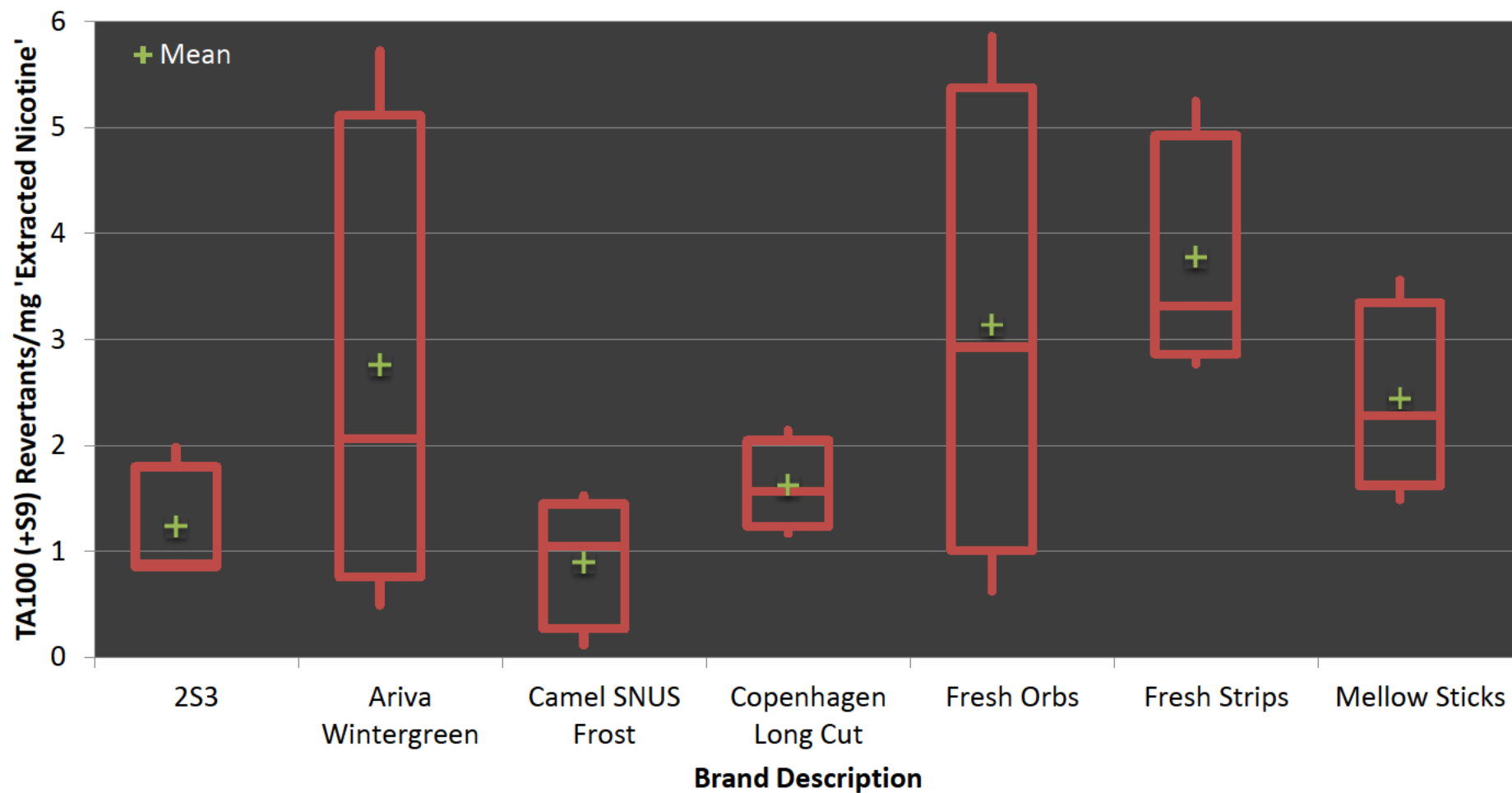
Date 26 October 2009



Test Describe - Comparative

Performed by TA100 (+S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

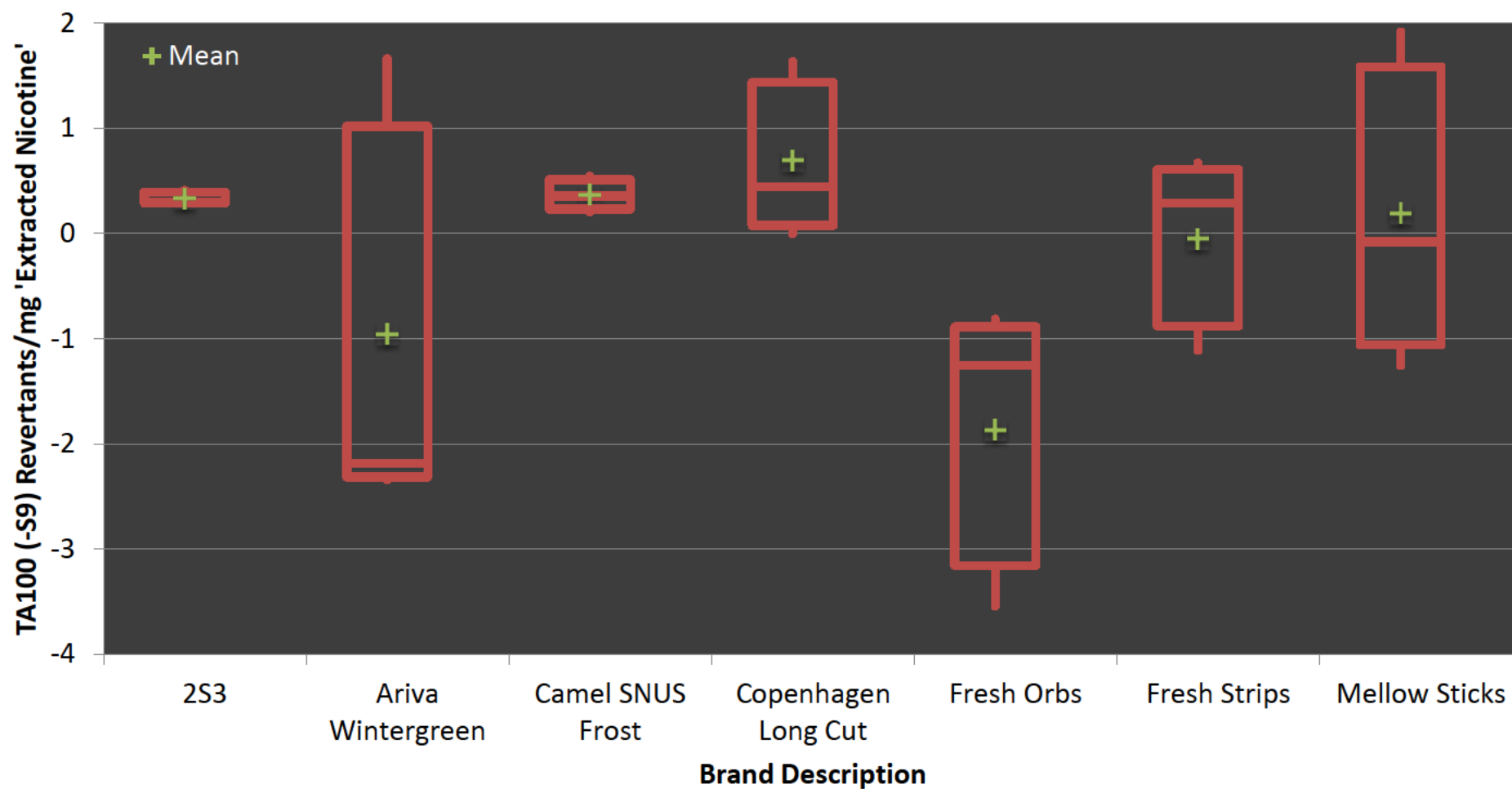
Date 26 October 2009



Test Describe - Comparative

Performed by TA100 (-S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

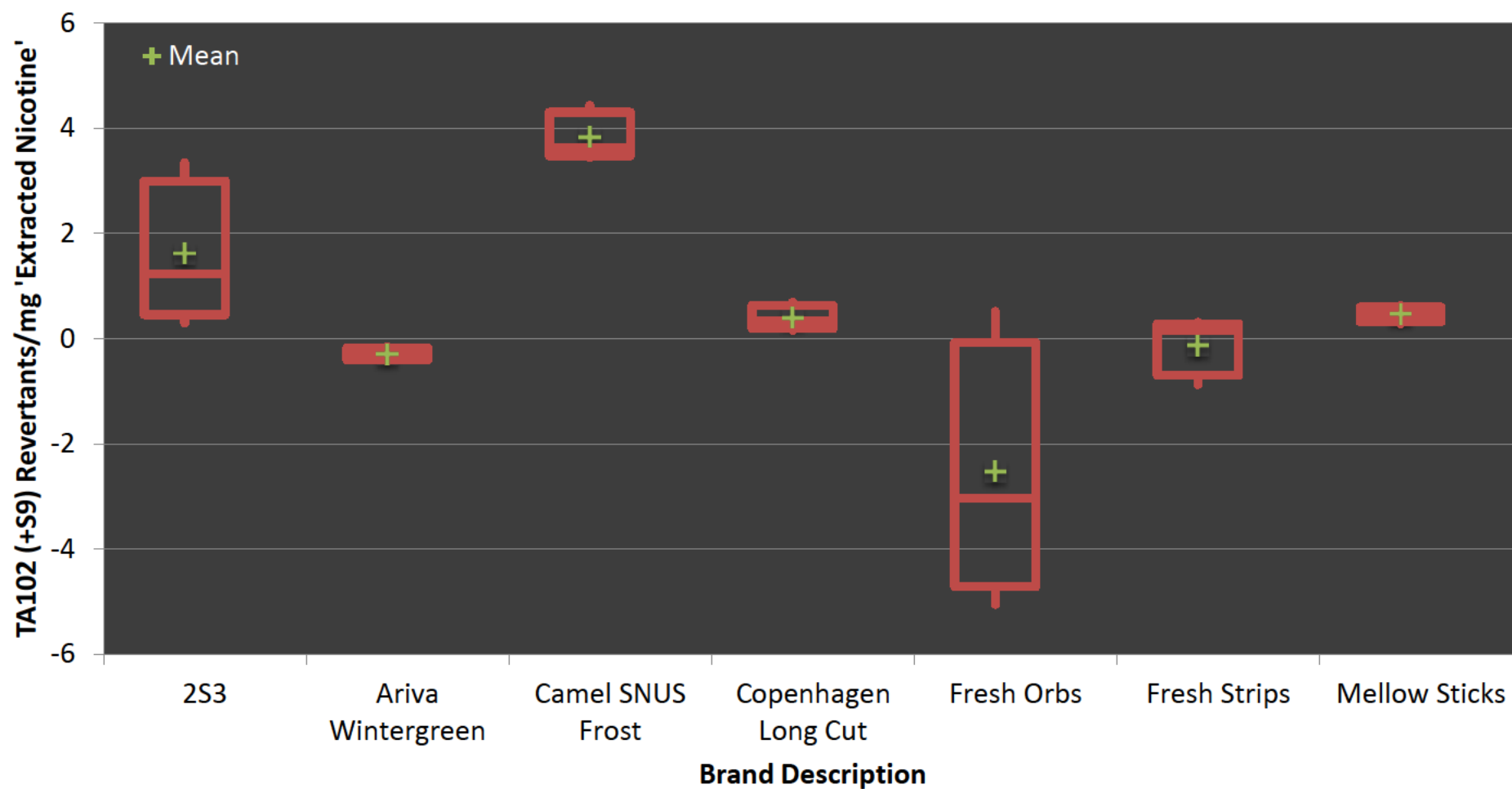
Date 26 October 2009



Test Describe - Comparative

Performed by TA102 (+S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

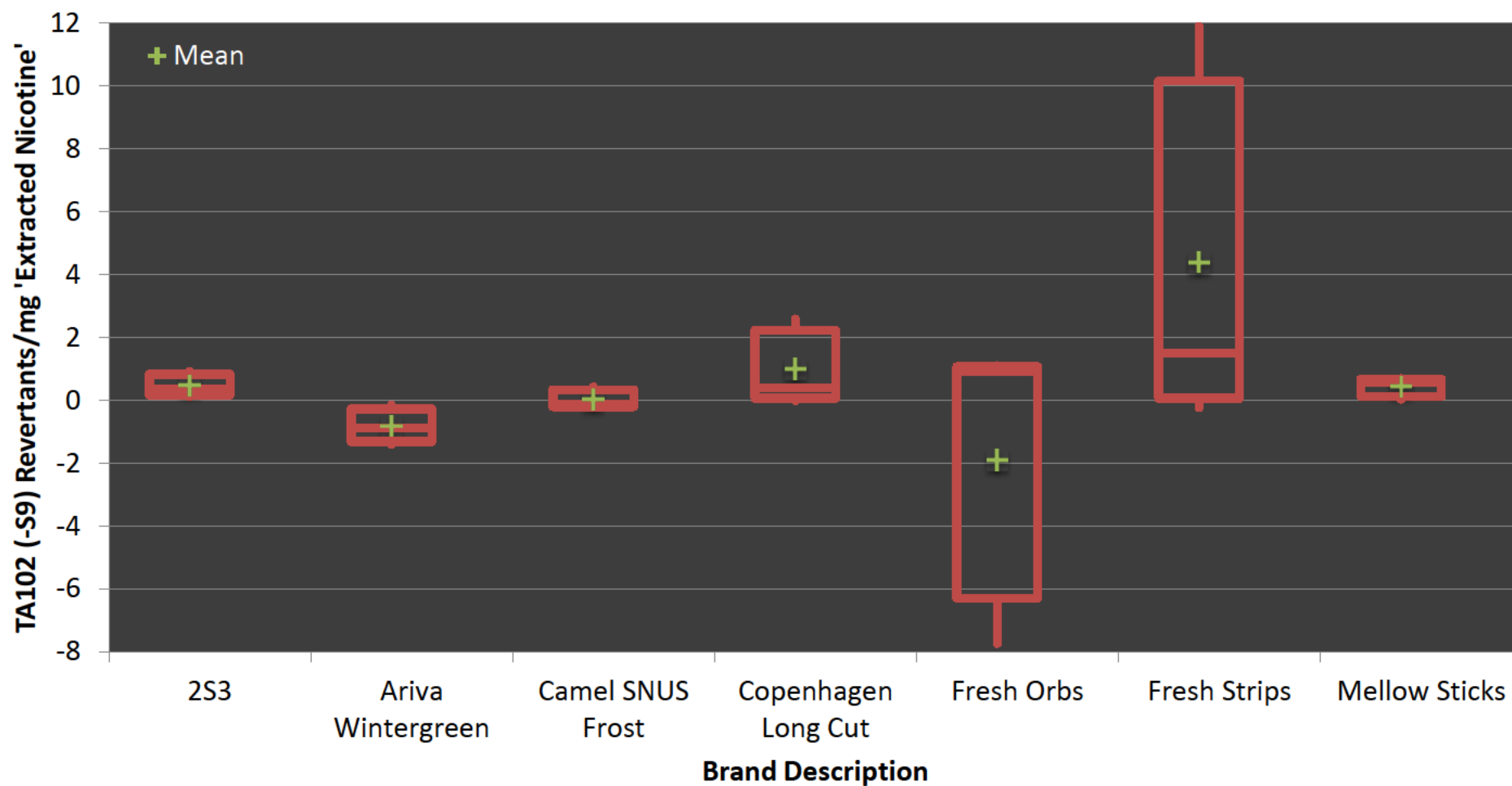
Date 26 October 2009



Test Describe - Comparative

Performed by TA102 (-S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

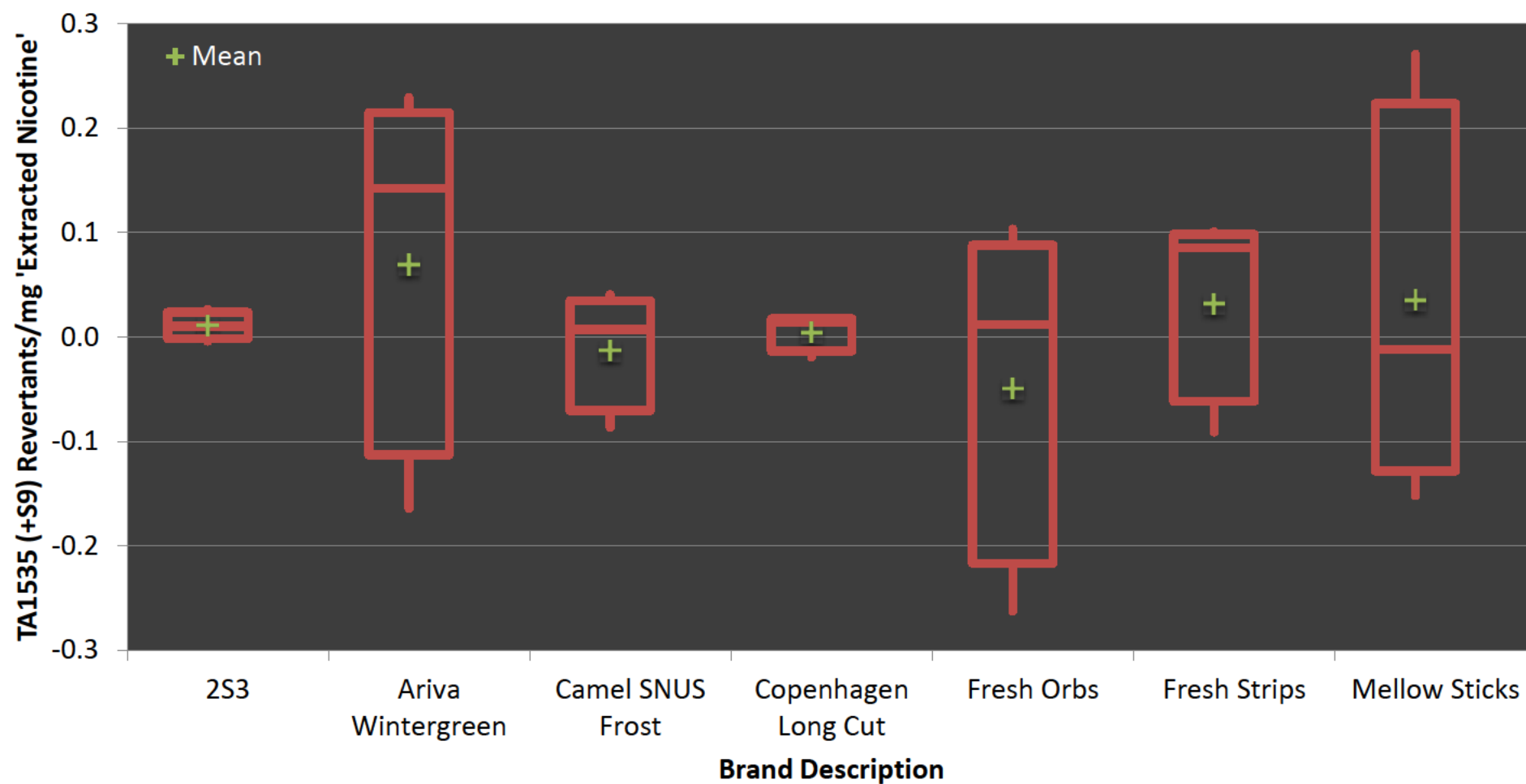
Date 26 October 2009



Test Describe - Comparative

Performed by TA1535 (+S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

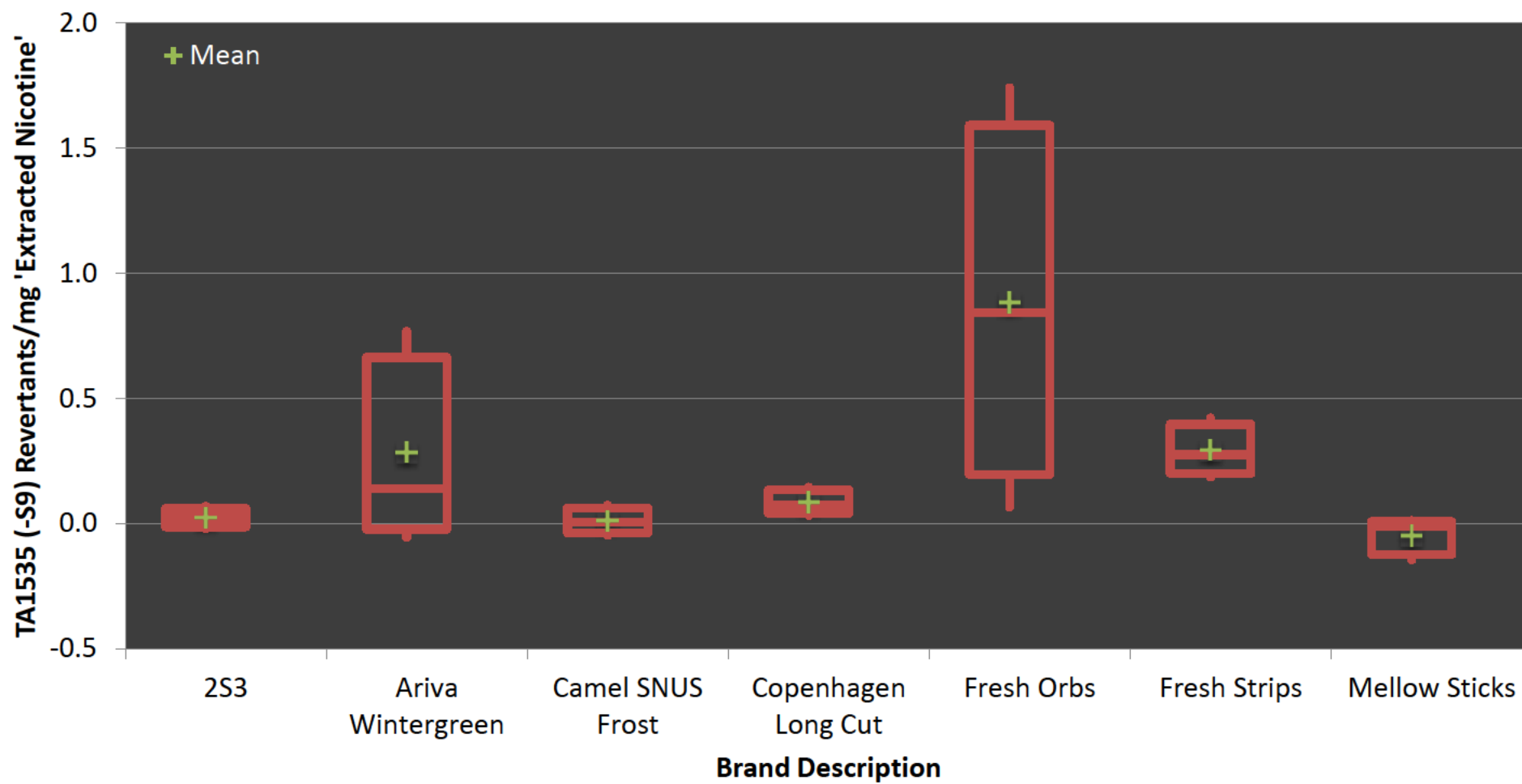
Date 26 October 2009



Test Describe - Comparative

Performed by TA1535 (-S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

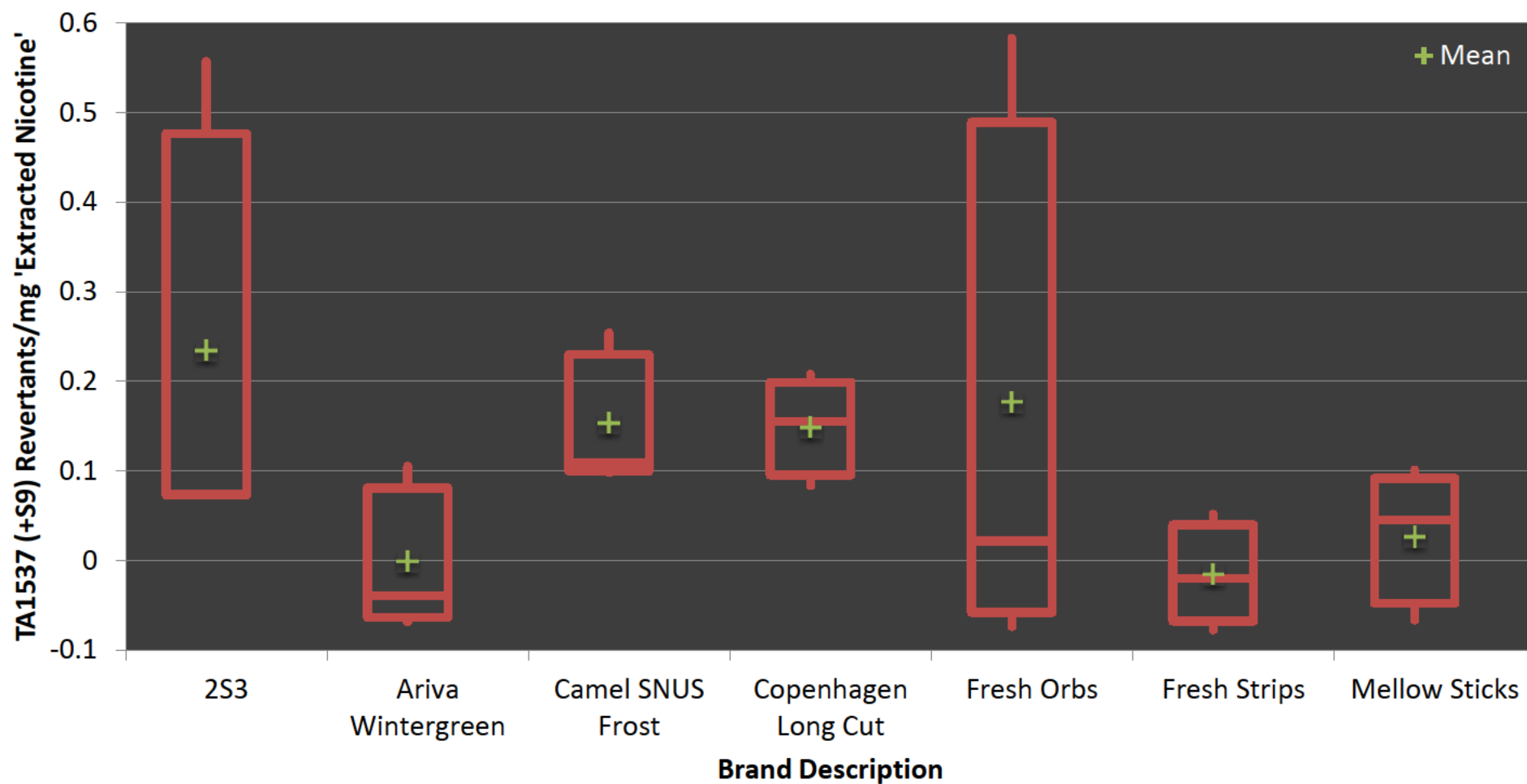
Date 26 October 2009



Test Describe - Comparative

Performed by TA1537 (+S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

Date 26 October 2009



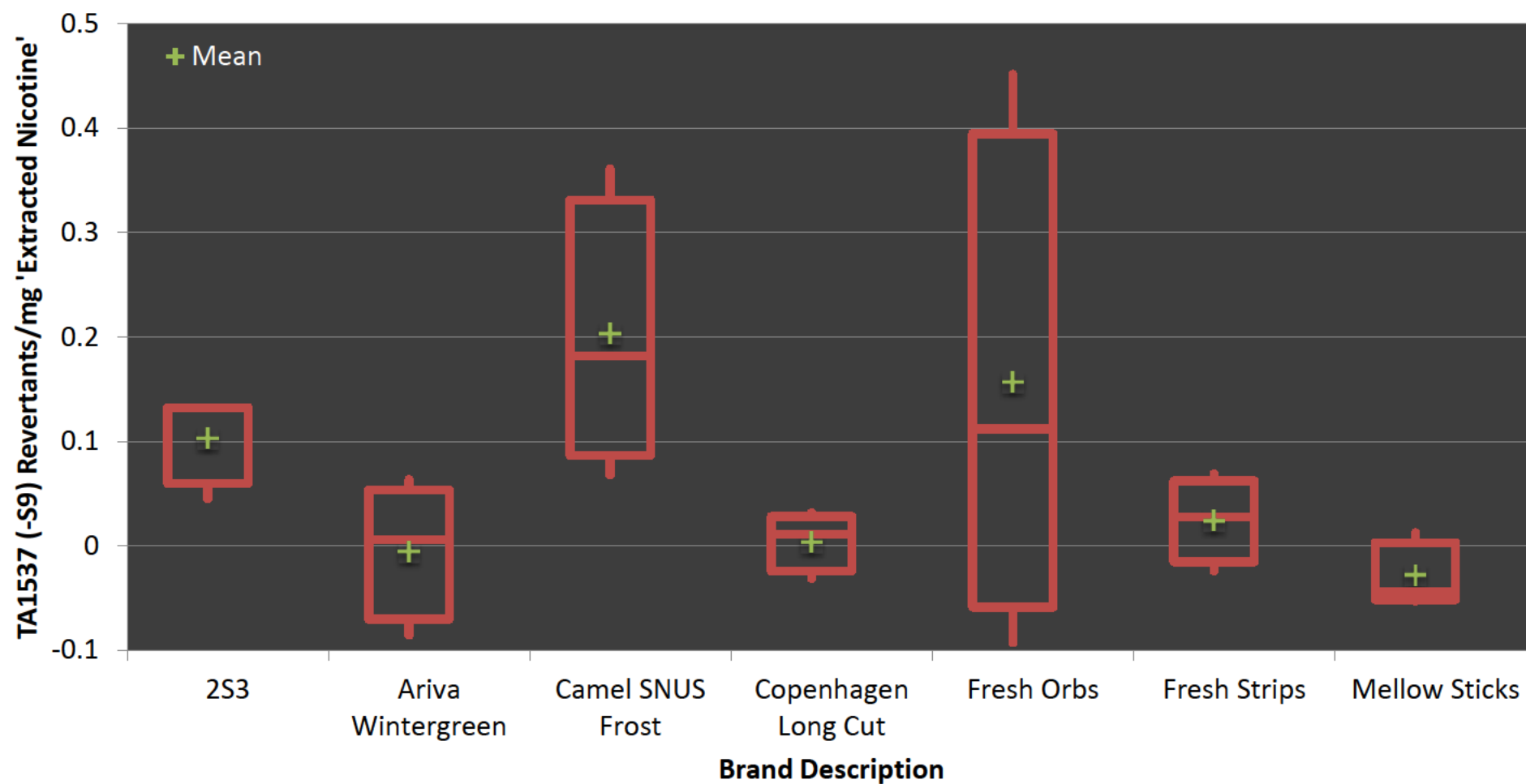
Test Describe - Comparative

Performed by

TA1537 (-S9): Revertants/mg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

Date

26 October 2009



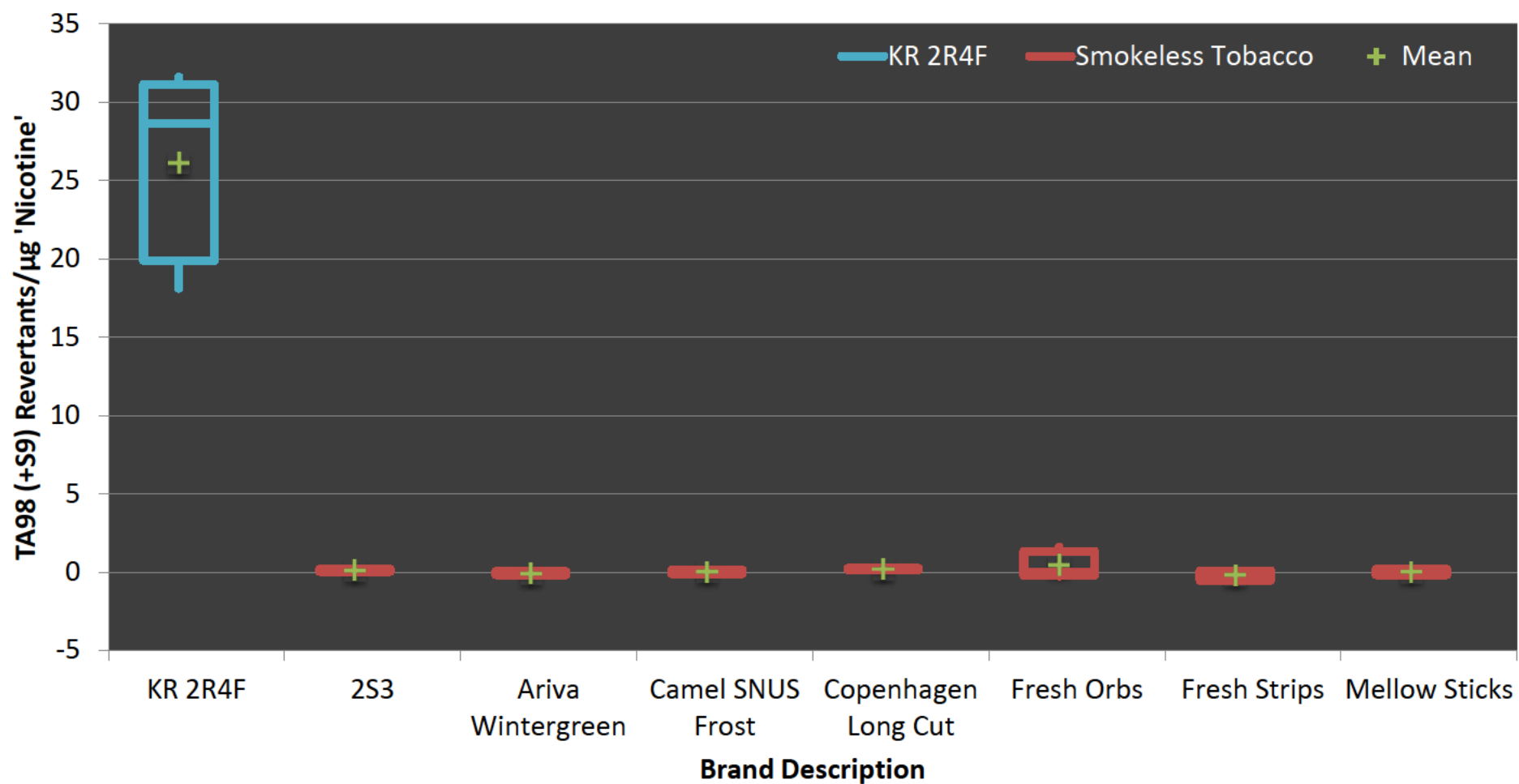
Test Describe - Comparative

Performed by

TA98 (+S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

Date

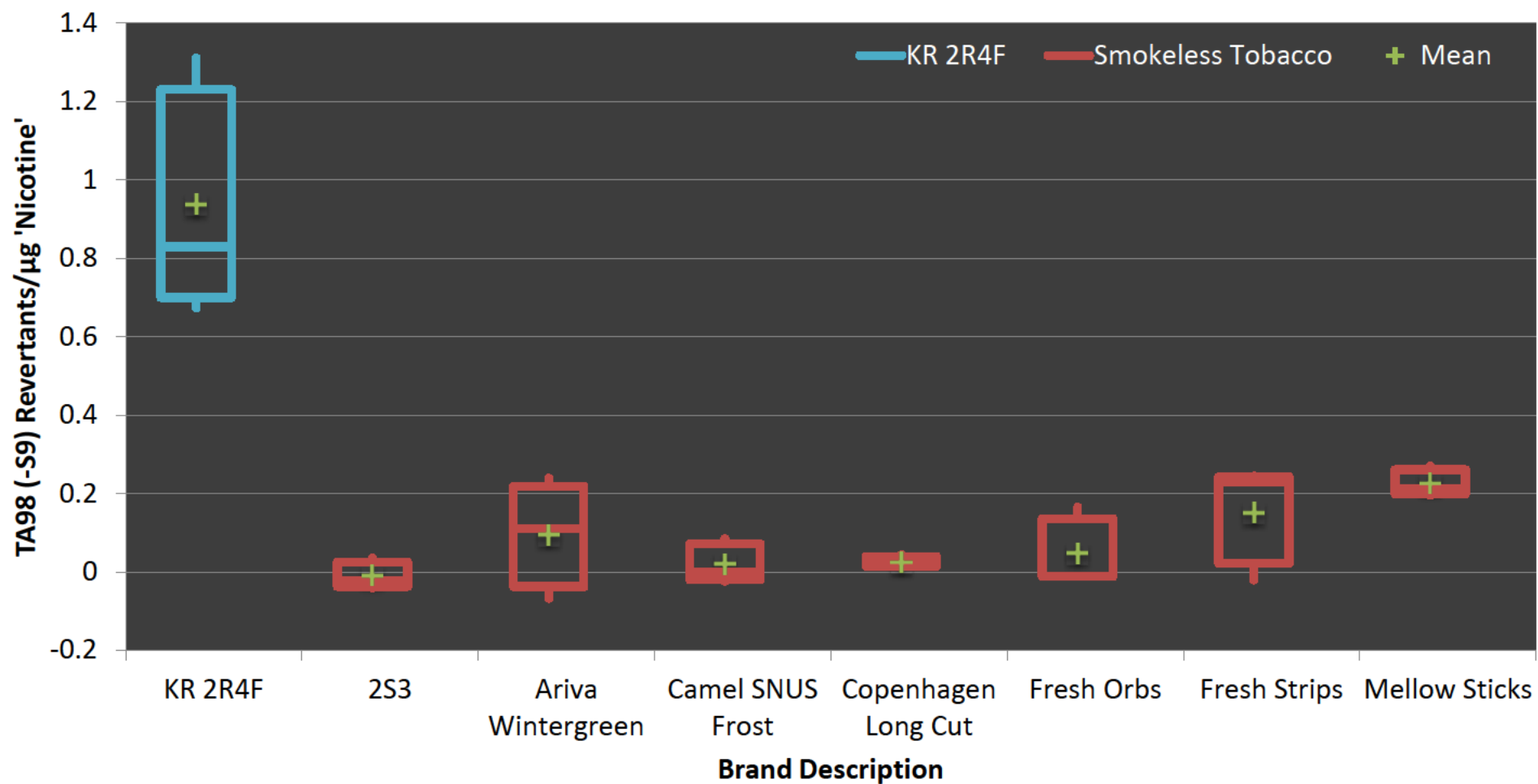
11 December 2009



Test Describe - Comparative

Performed by TA98 (-S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

Date 11 December 2009



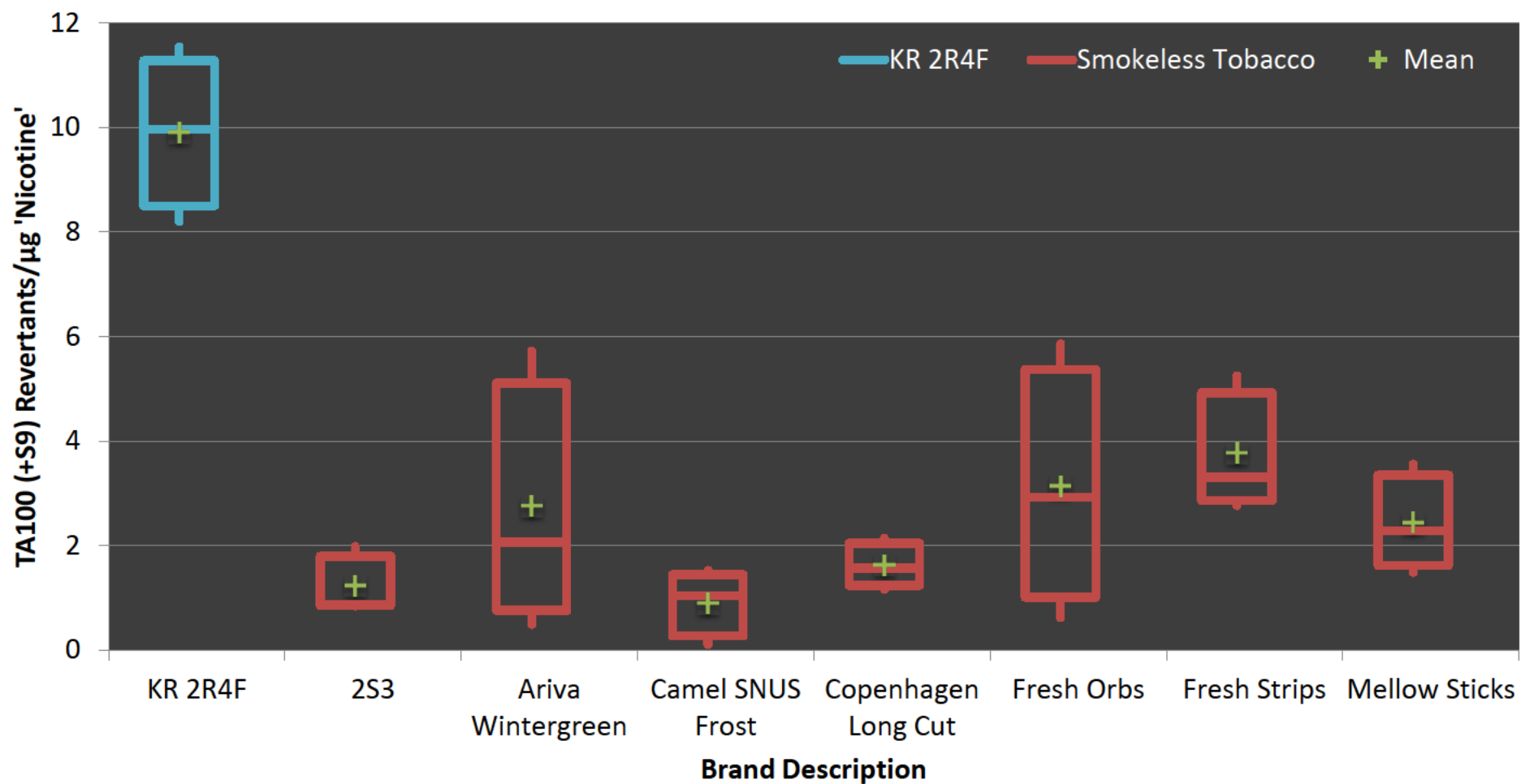
Test Describe - Comparative

Performed by

TA100 (+S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

Date

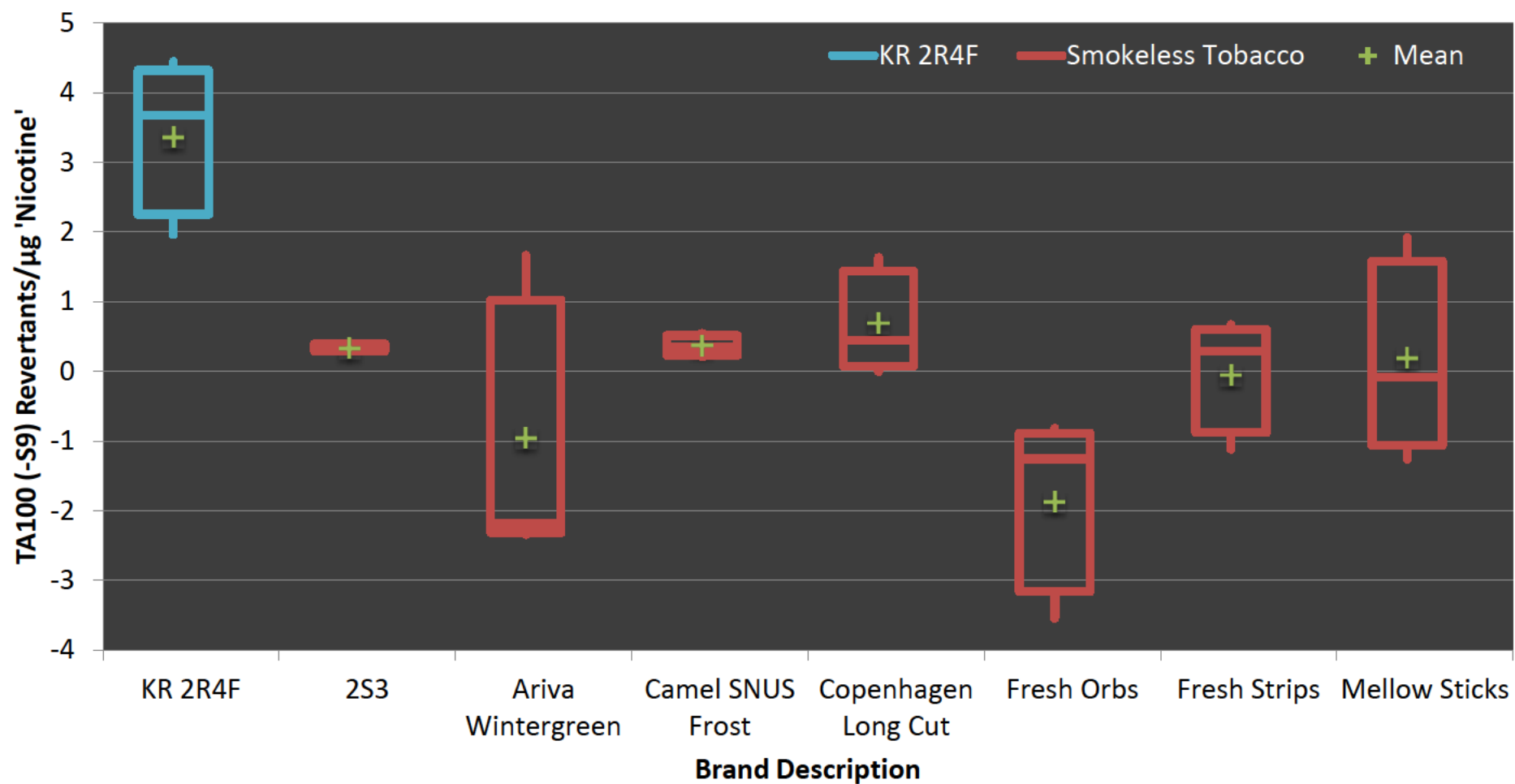
11 December 2009



Test Describe - Comparative

Performed by TA100 (-S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

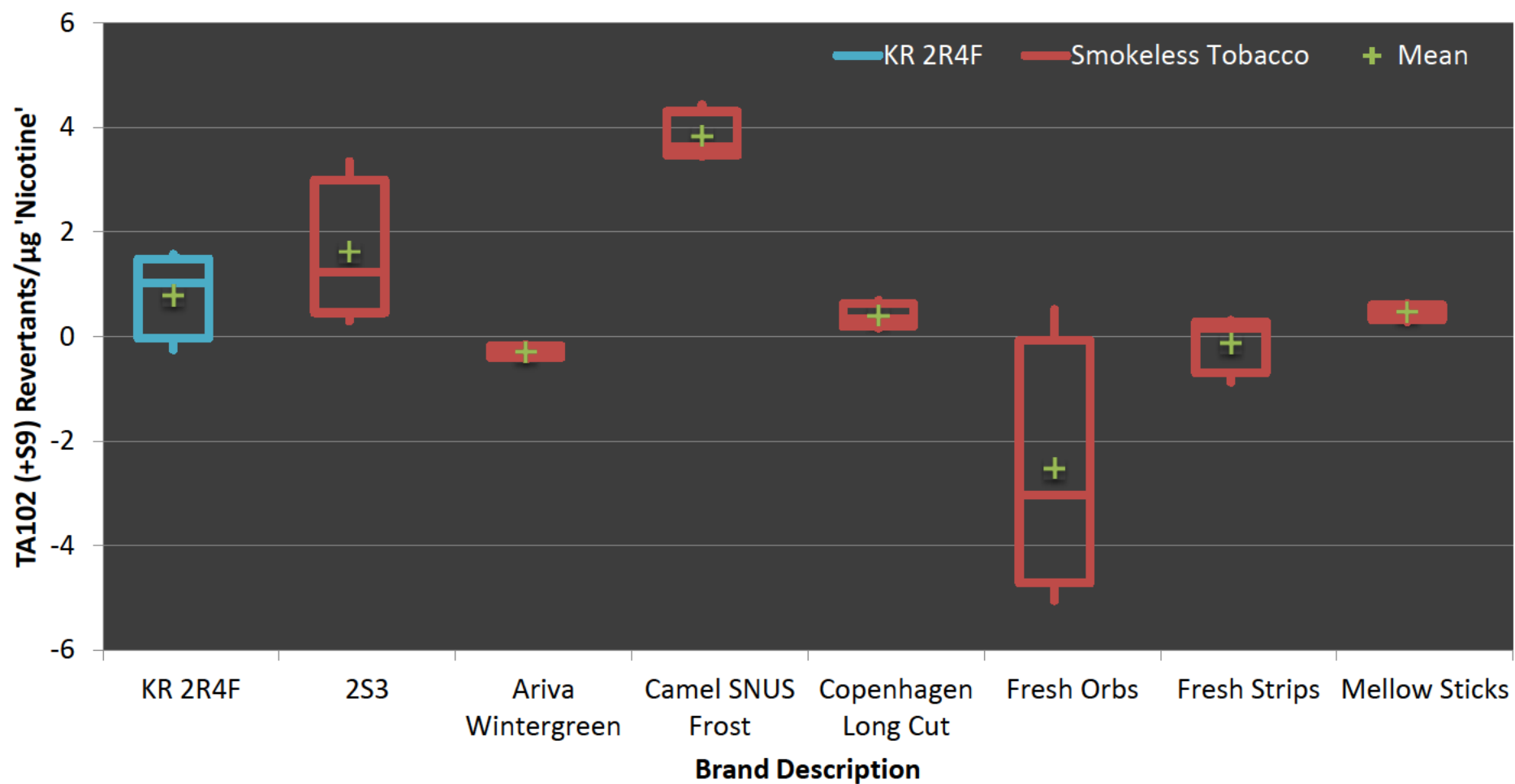
Date 11 December 2009



Test Describe - Comparative

Performed by TA102 (+S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

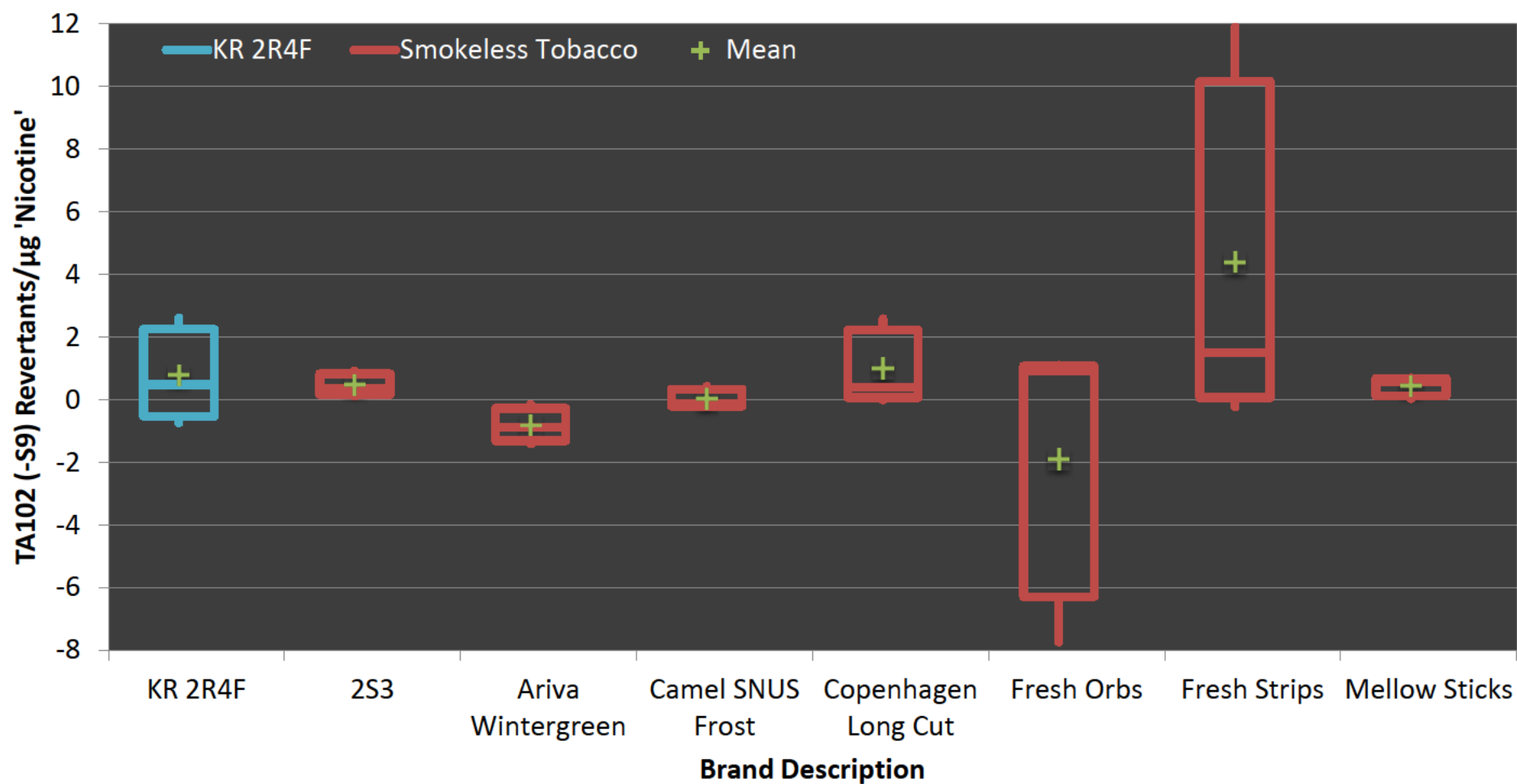
Date 11 December 2009



Test Describe - Comparative

Performed by TA102 (-S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

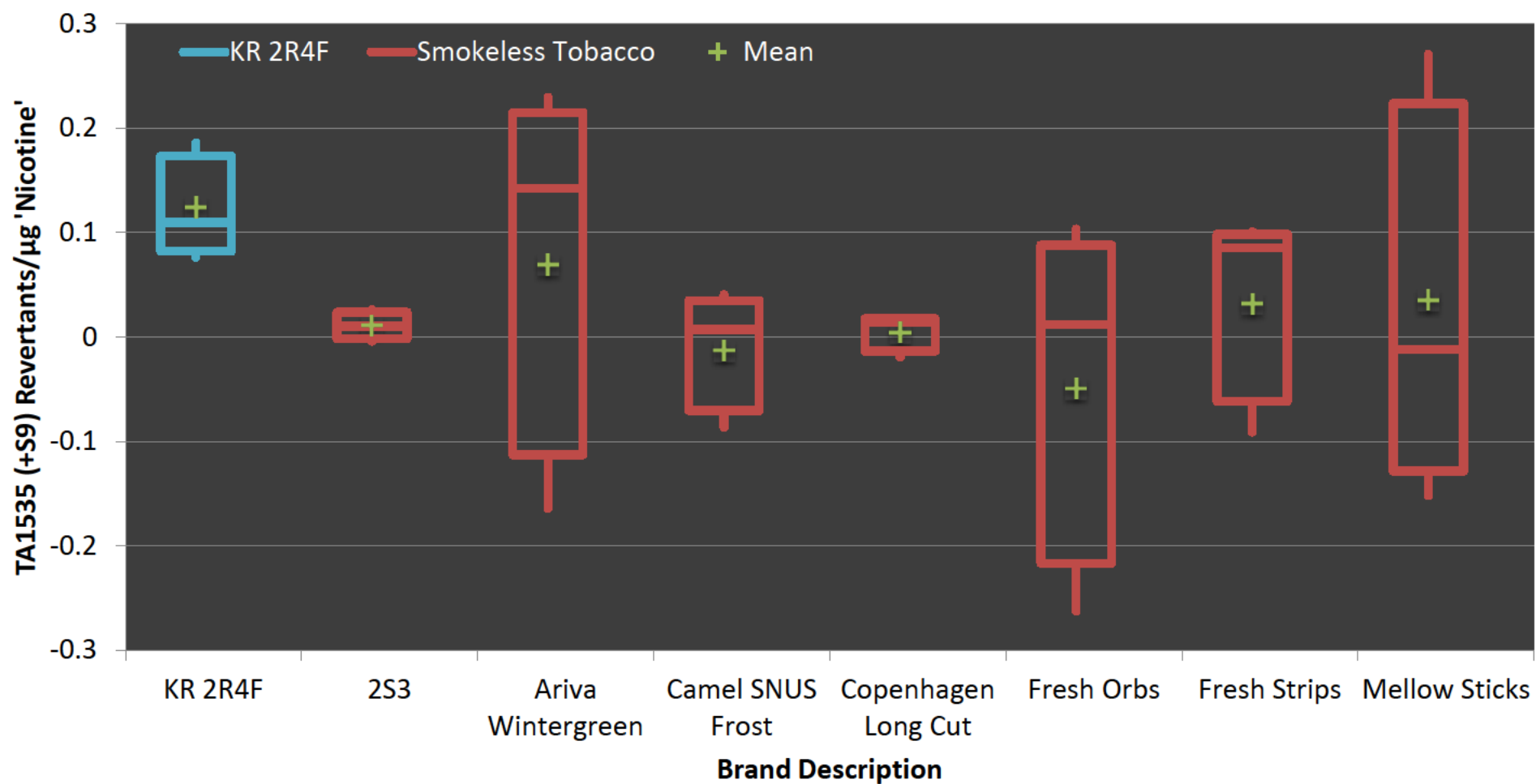
Date 11 December 2009



Test Describe - Comparative

Performed by TA1535 (+S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

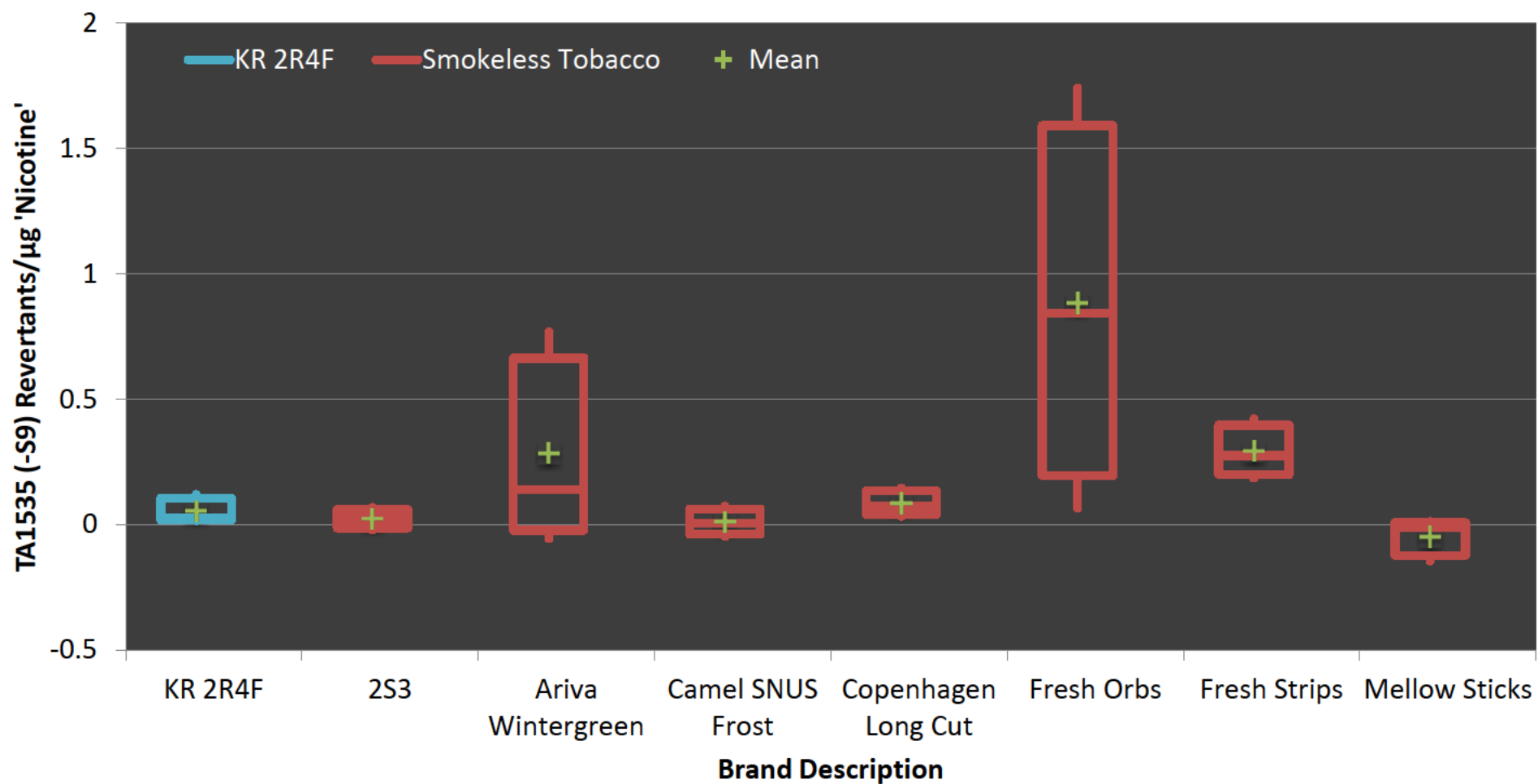
Date 11 December 2009



Test Describe - Comparative

Performed by TA1535 (-S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

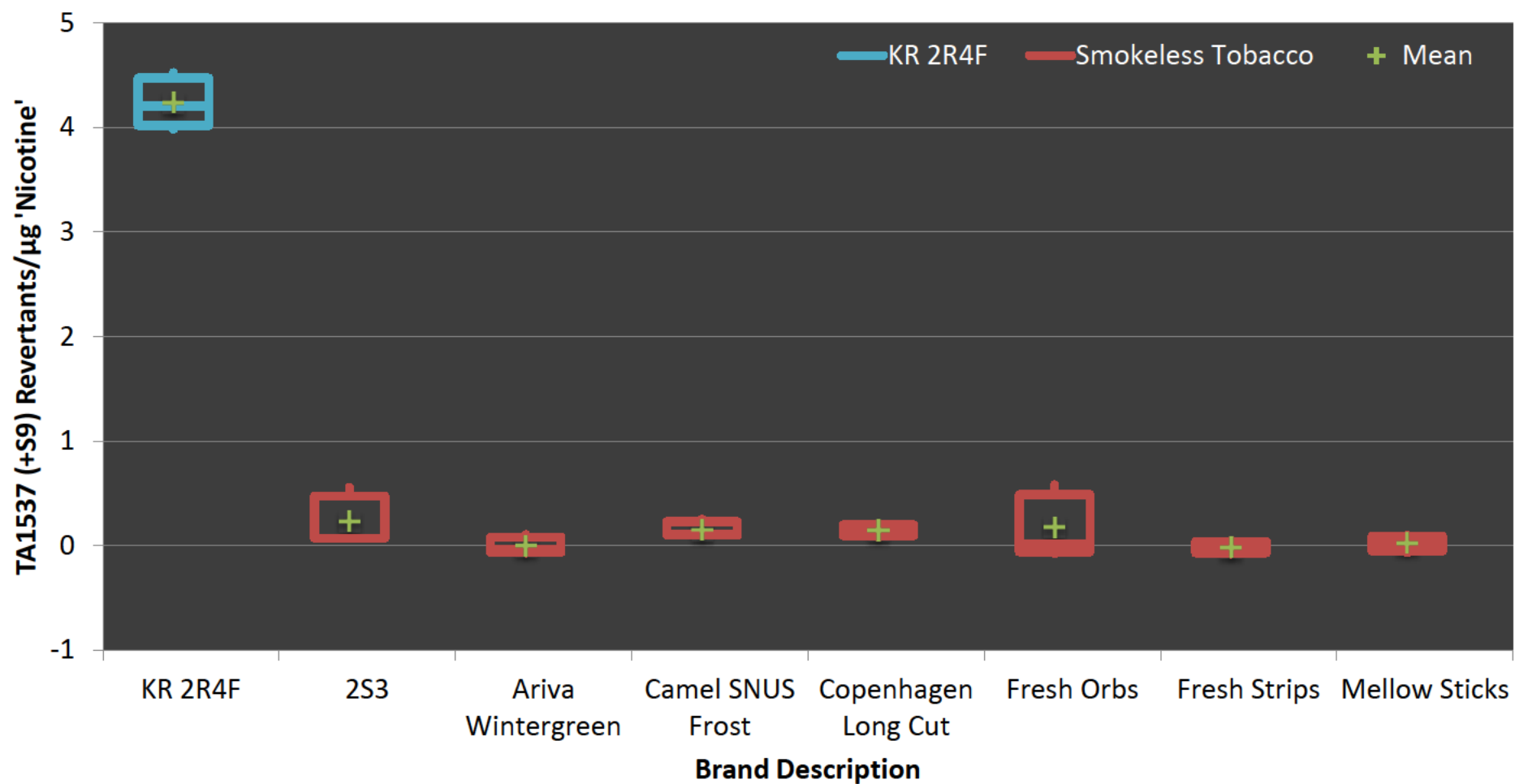
Date 11 December 2009



Test Describe - Comparative

Performed by TA1537 (+S9): Revertants/ μ g 'Nicotine in CSC' and Revertants/ μ g 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

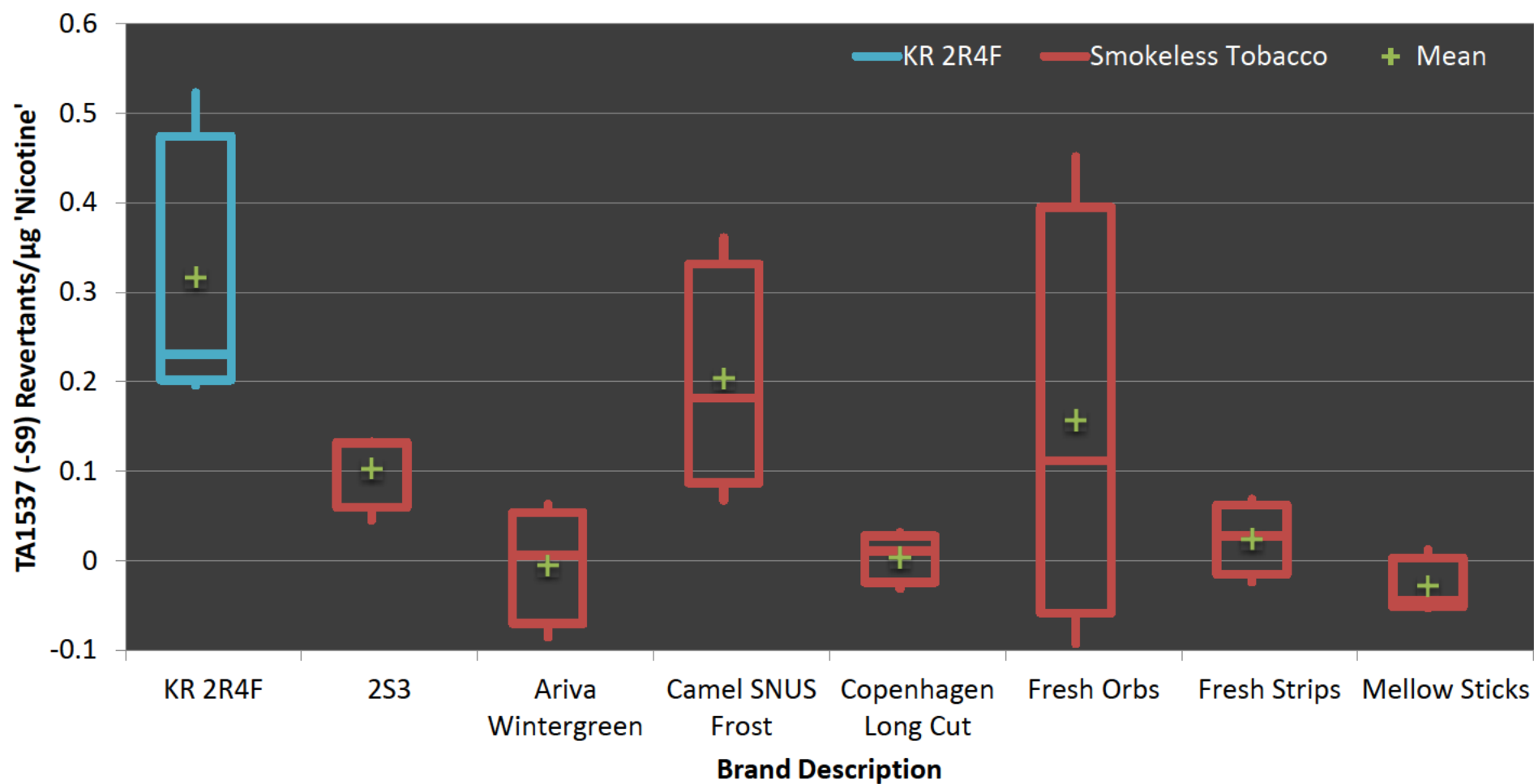
Date 11 December 2009



Test Describe - Comparative

Performed by TA1537 (-S9): Revertants/ μg 'Nicotine in CSC' and Revertants/ μg 'Extracted Nicotine in DMSO' Slope by Brand
Wendy Wagstaff

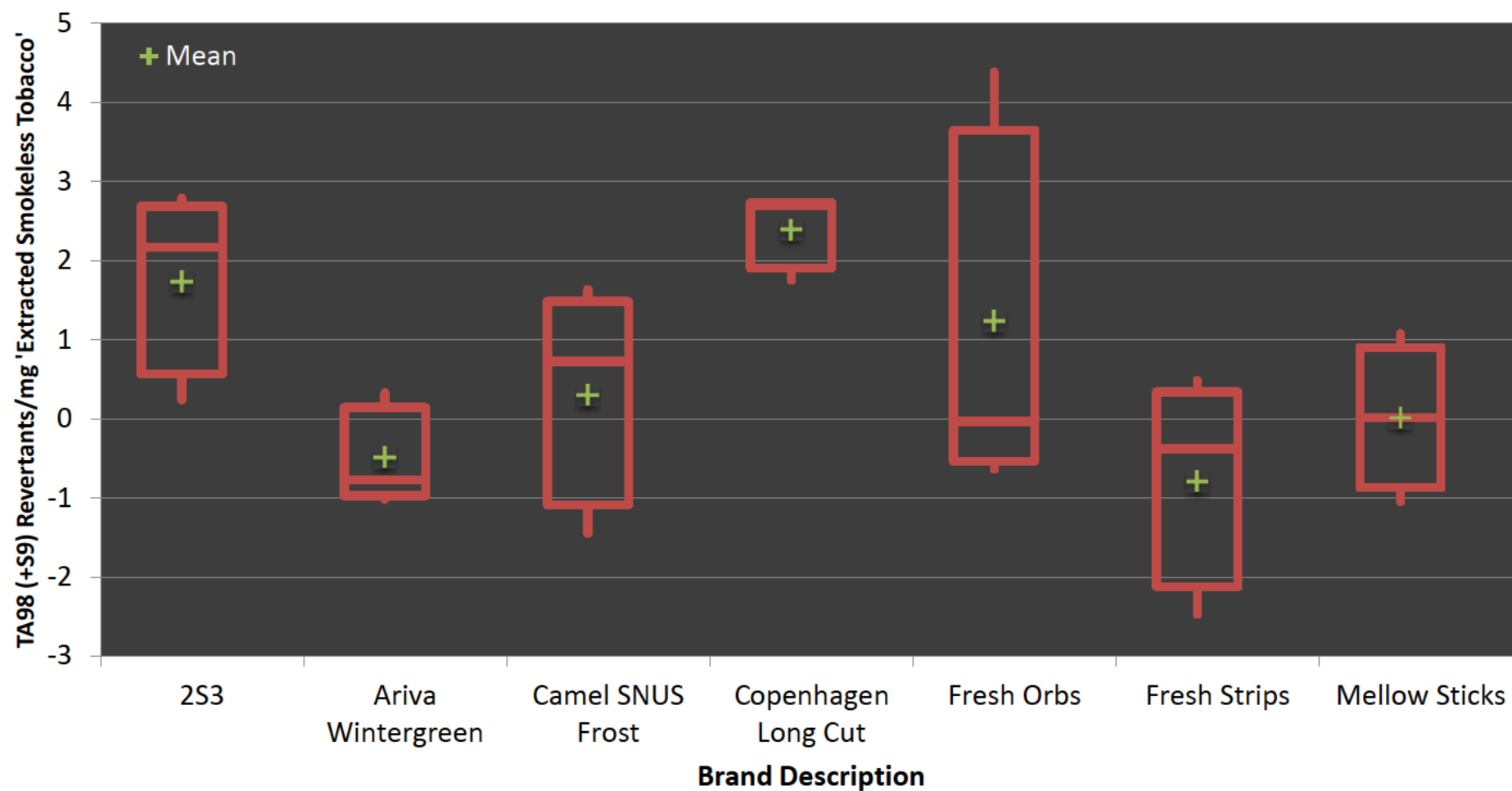
Date 11 December 2009



Test Describe - Comparative

Performed by TA98 (+S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

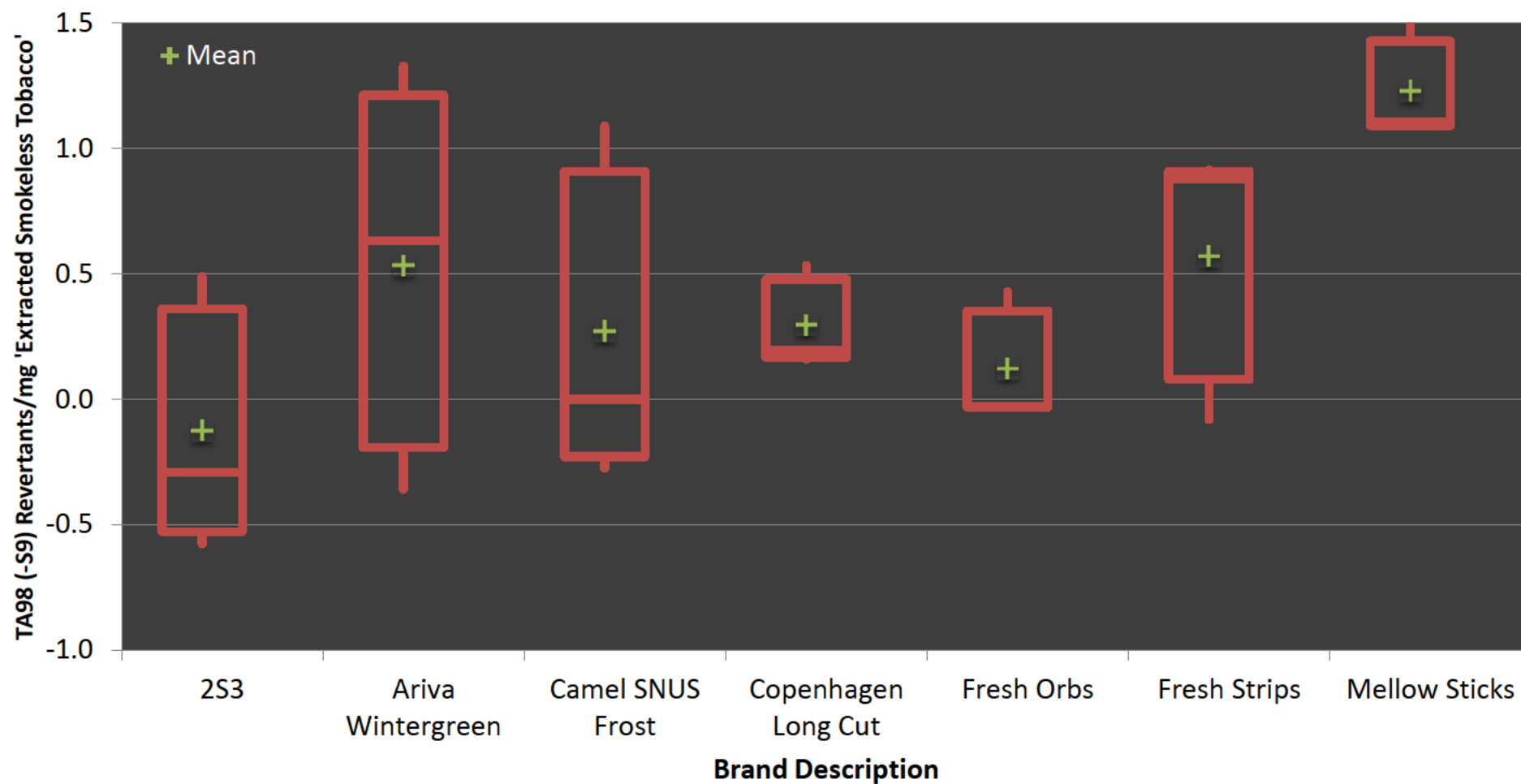
Date 26 October 2009



Test Describe - Comparative

Performed by TA98 (-S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date 26 October 2009



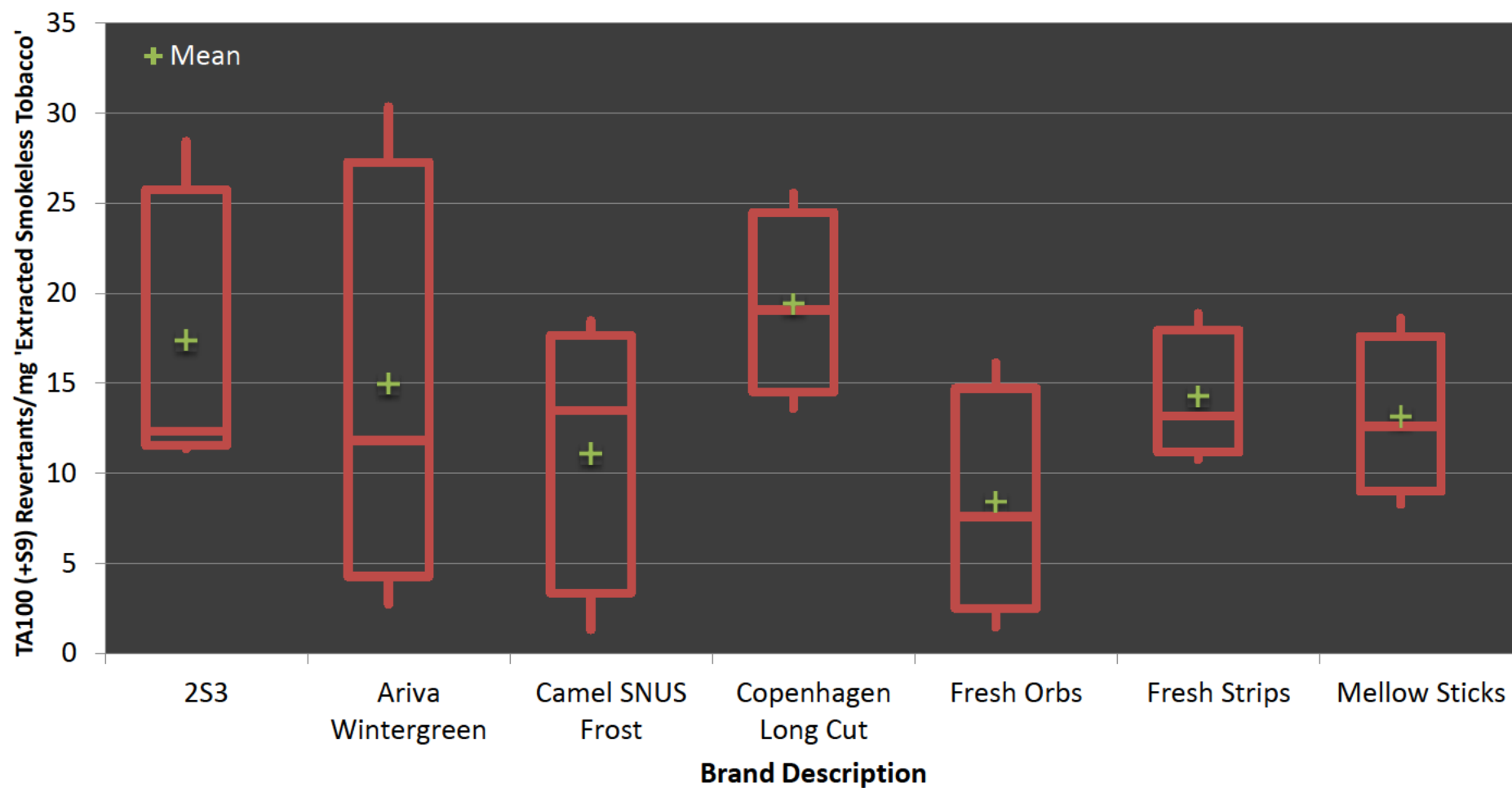
Test Describe - Comparative

Performed by

TA100 (+S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date

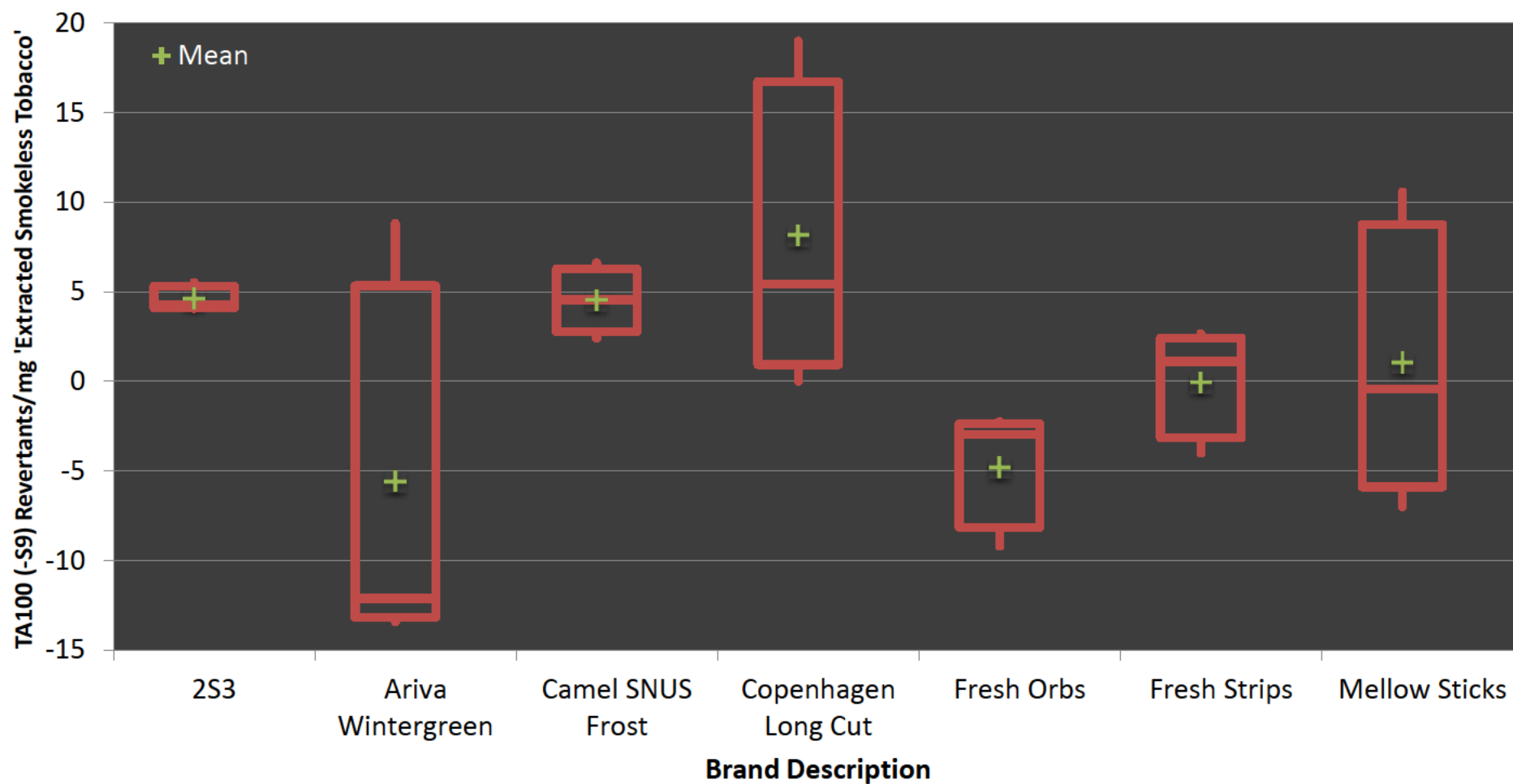
26 October 2009



Test Describe - Comparative

Performed by TA100 (-S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date 26 October 2009



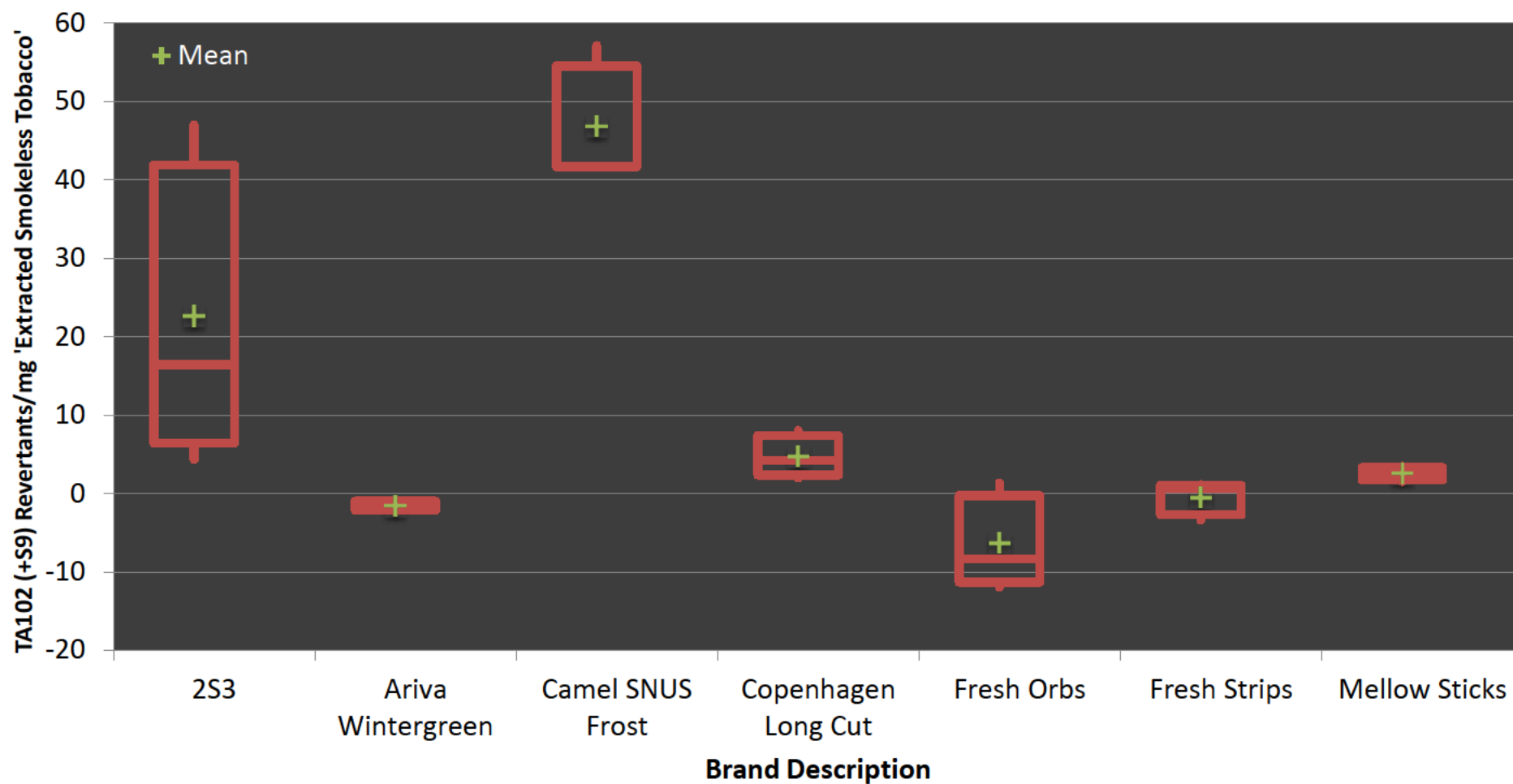
Test Describe - Comparative

Performed by

TA102 (+S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date

26 October 2009



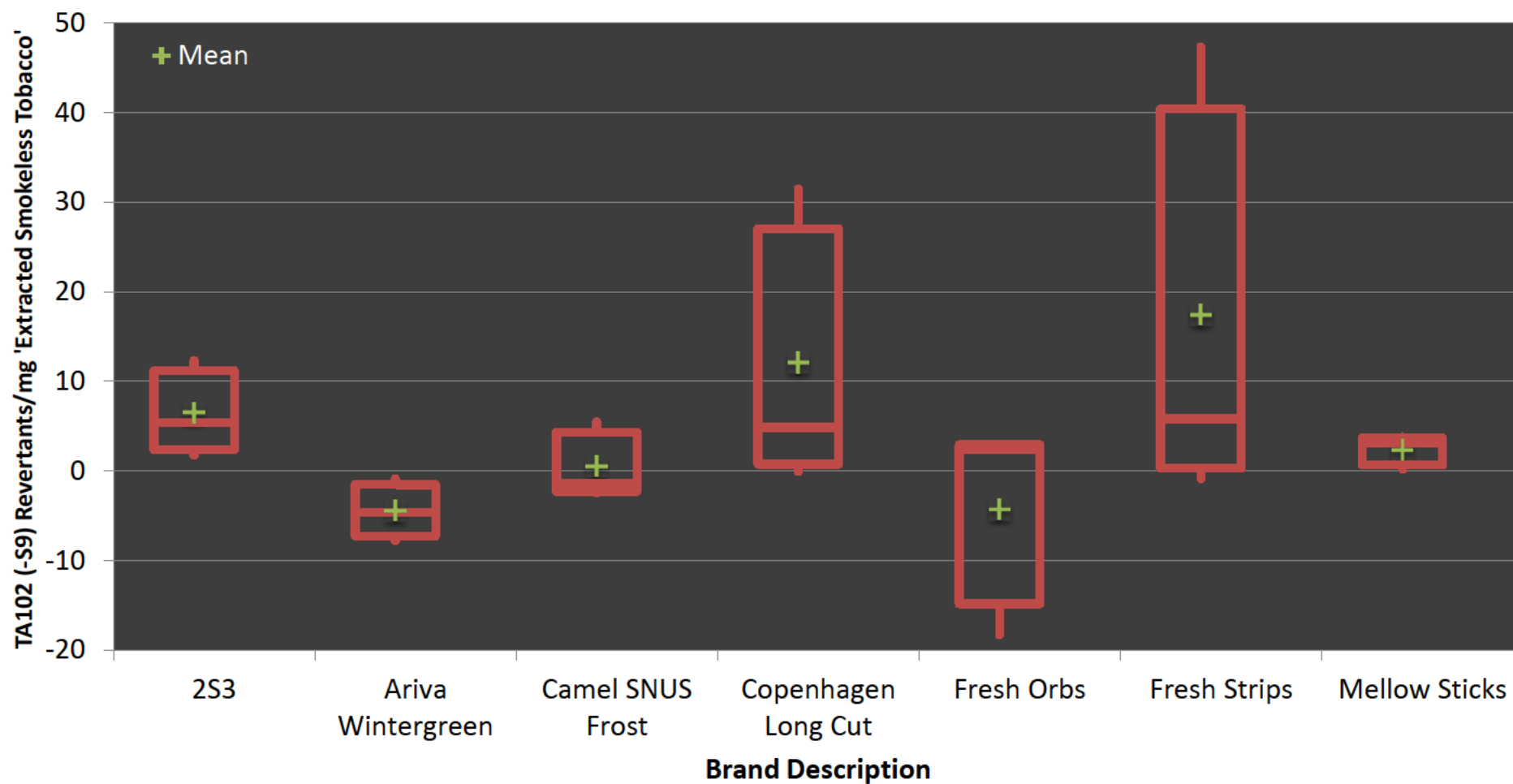
Test Describe - Comparative

Performed by

TA102 (-S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date

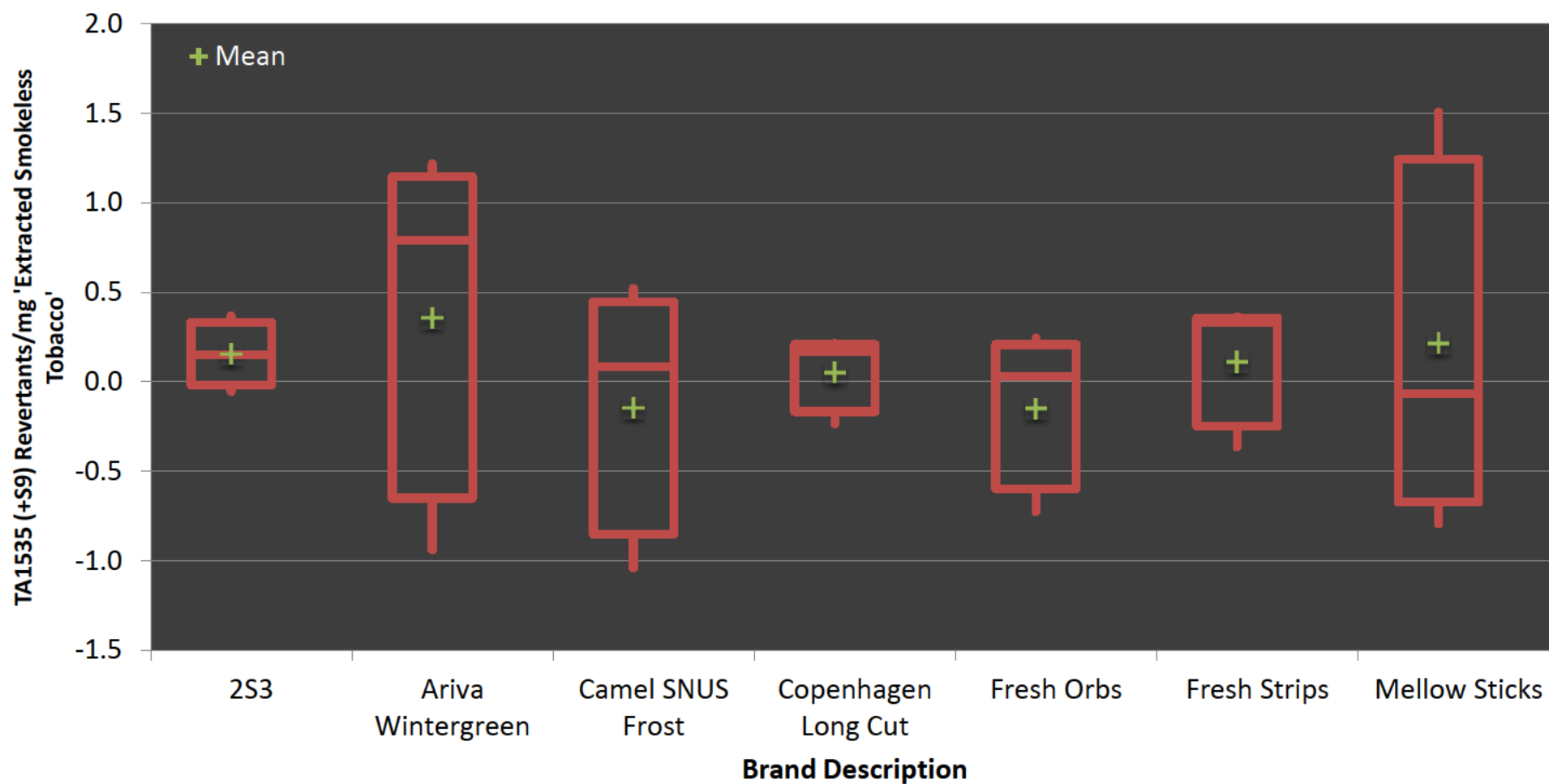
26 October 2009



Test Describe - Comparative

Performed by TA1535 (+S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

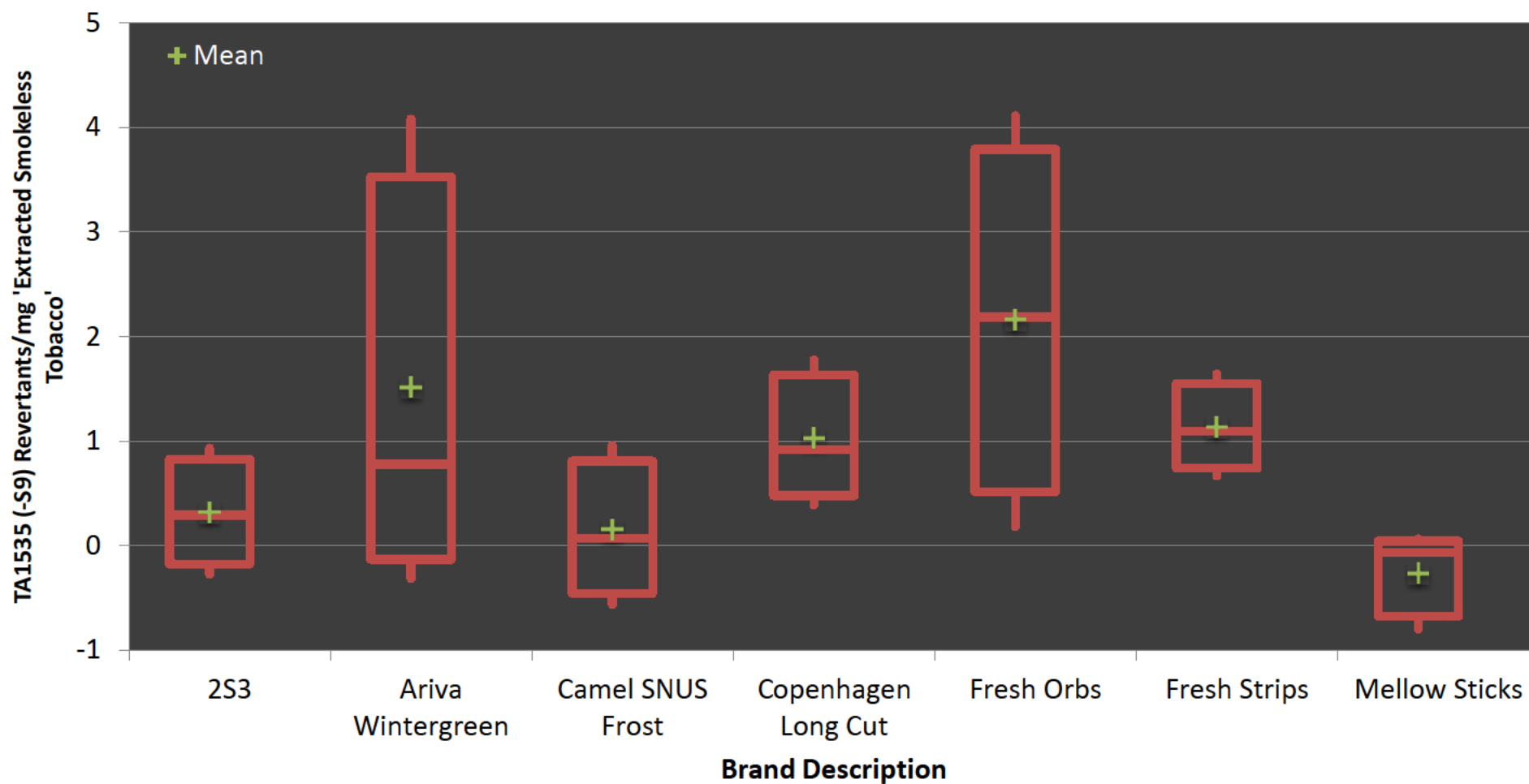
Date 26 October 2009



Test Describe - Comparative

Performed by TA1535 (-S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

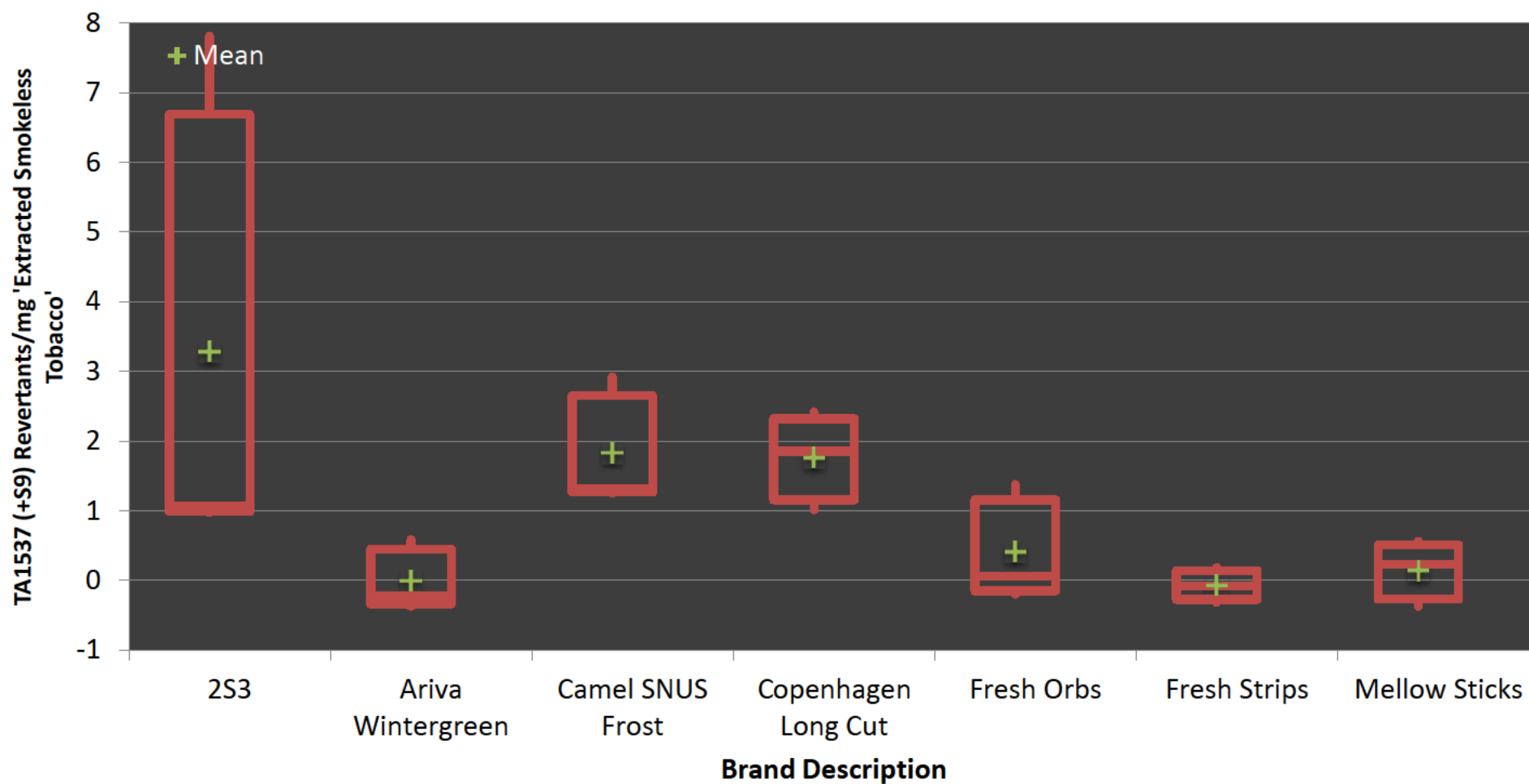
Date 26 October 2009



Test Describe - Comparative

Performed by TA1537 (+S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

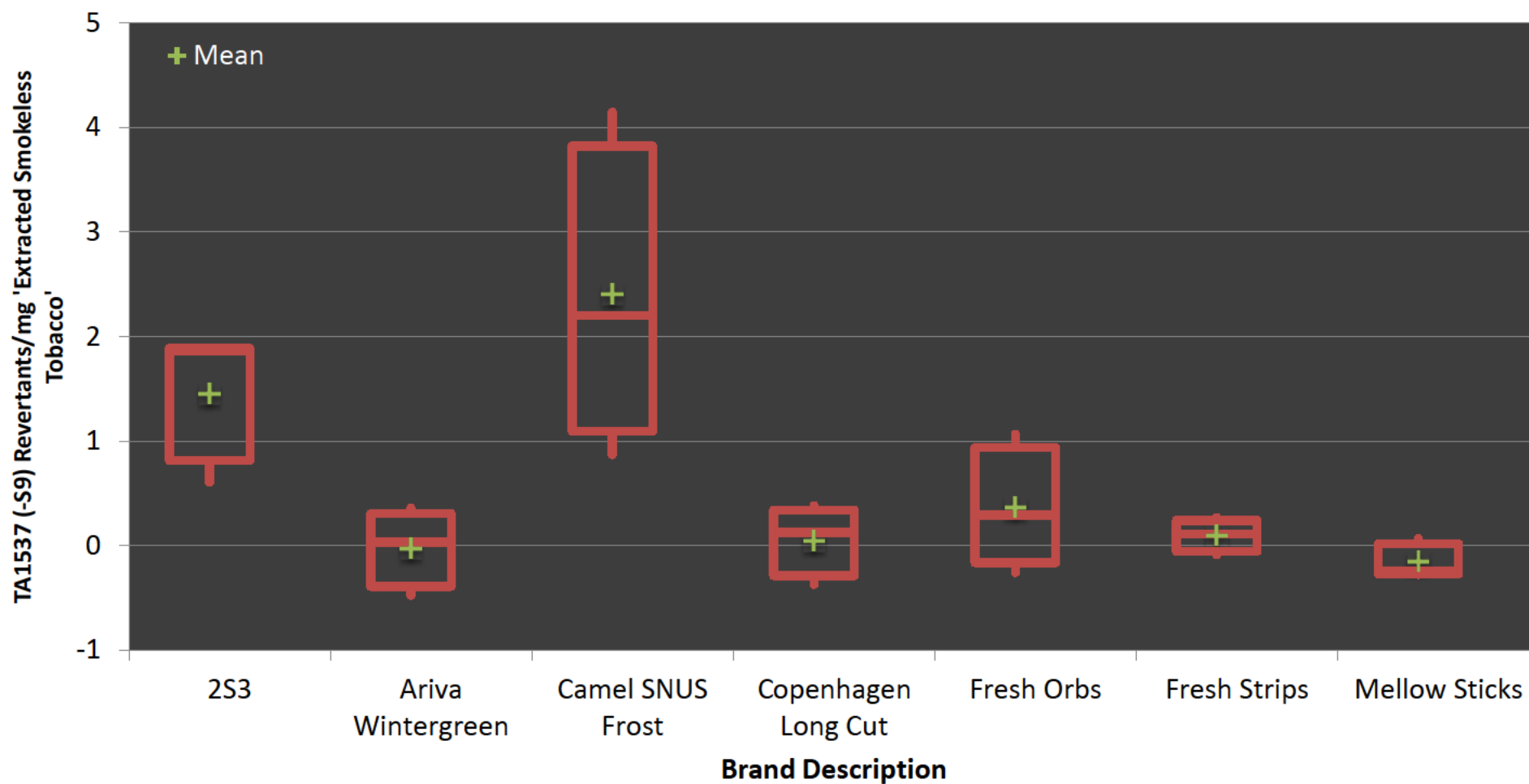
Date 26 October 2009



Test Describe - Comparative

Performed by TA1537 (-S9): Revertants/mg 'Extracted Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

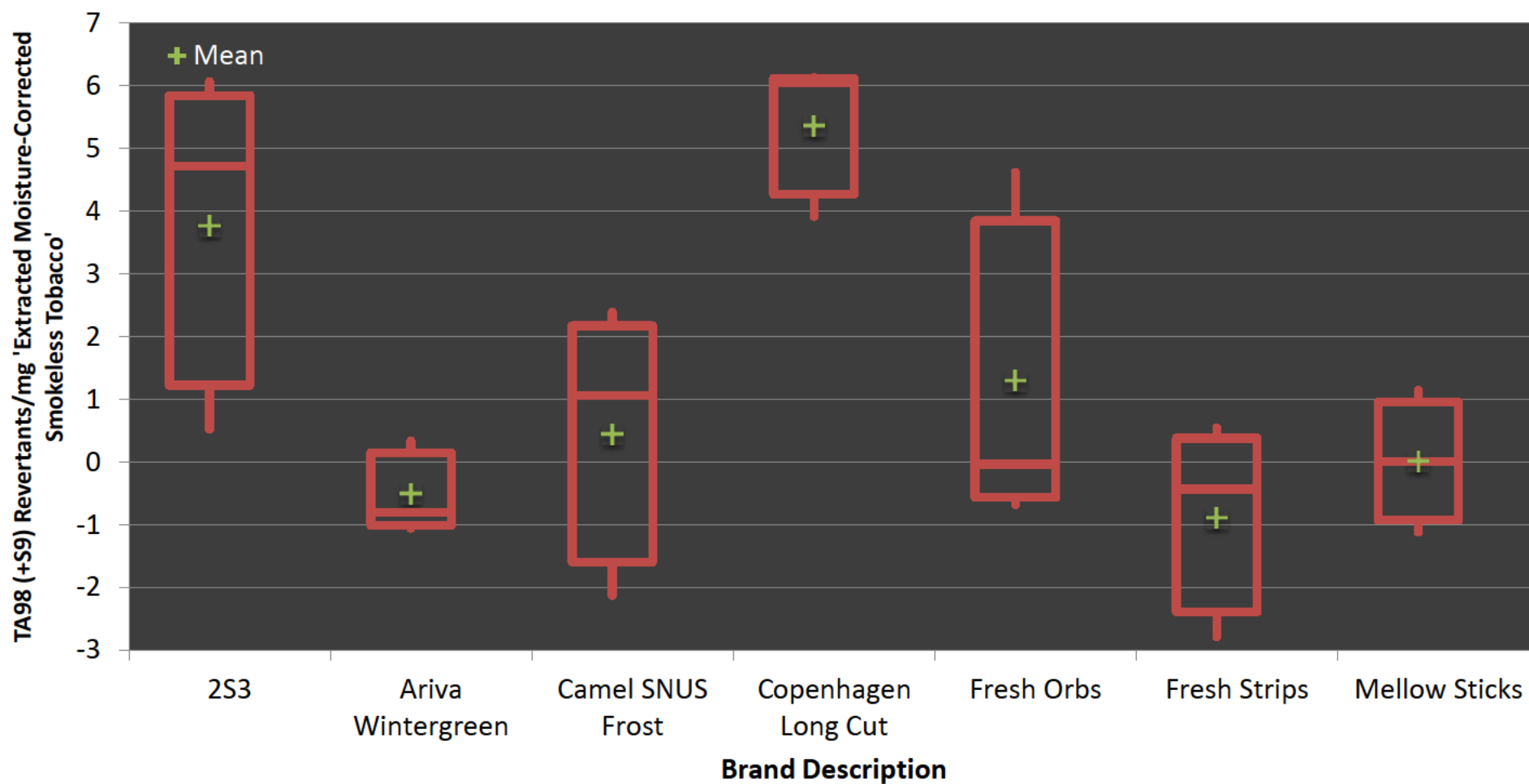
Date 26 October 2009



Test Describe - Comparative

Performed by TA98 (+S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

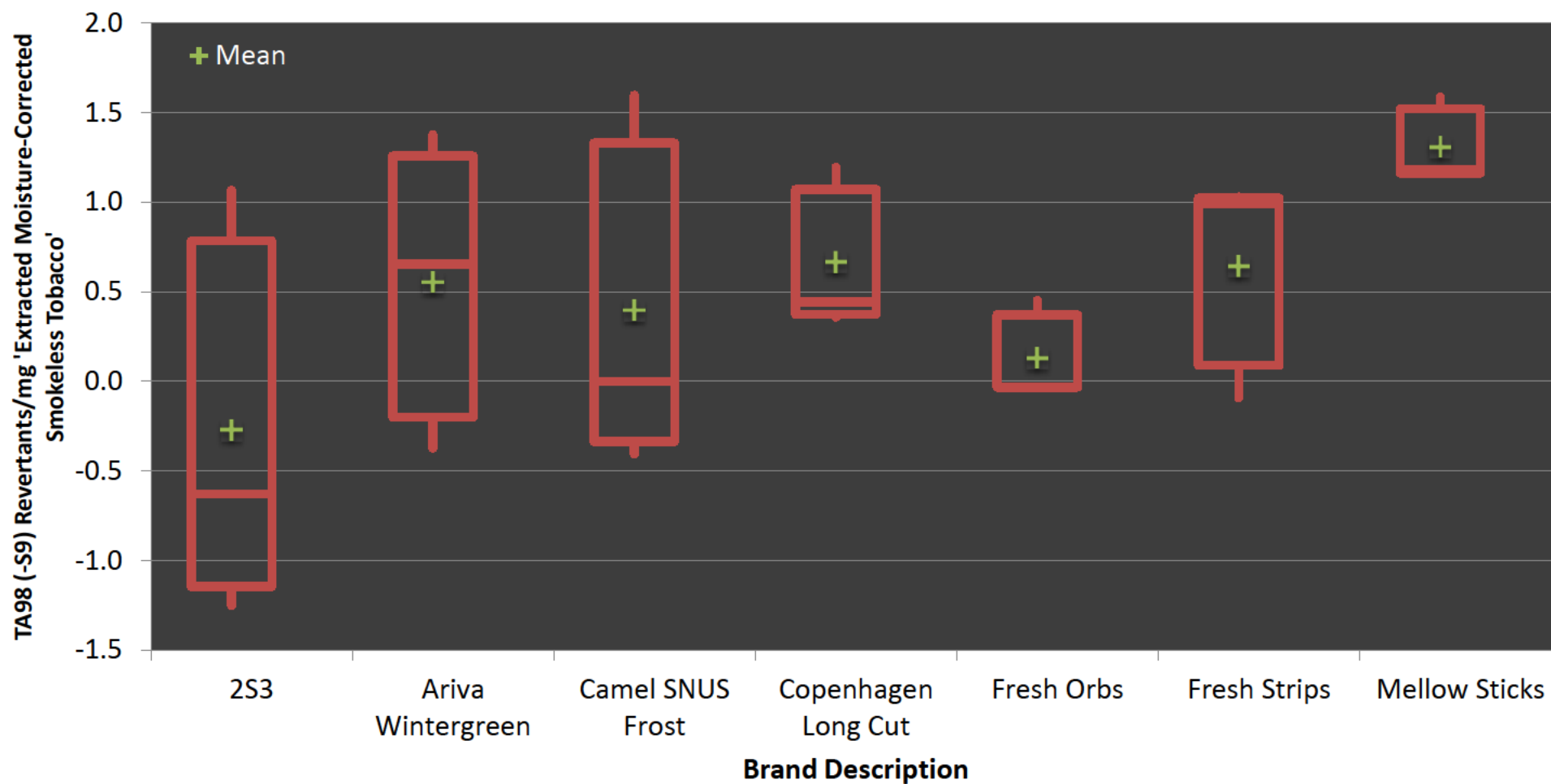
Date 26 October 2009



Test Describe - Comparative

Performed by TA98 (-S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date 26 October 2009



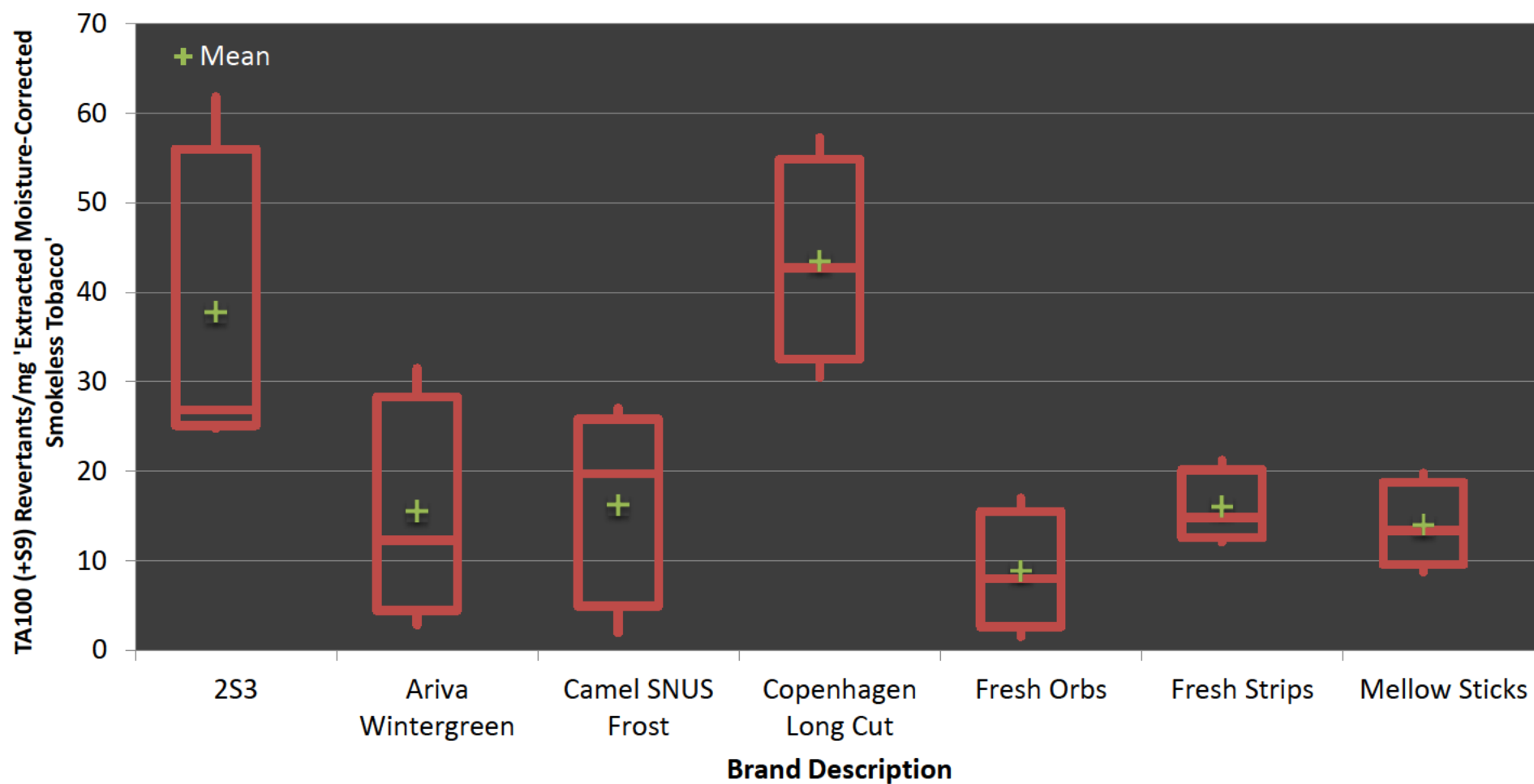
Test Describe - Comparative

Performed by

TA100 (+S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date

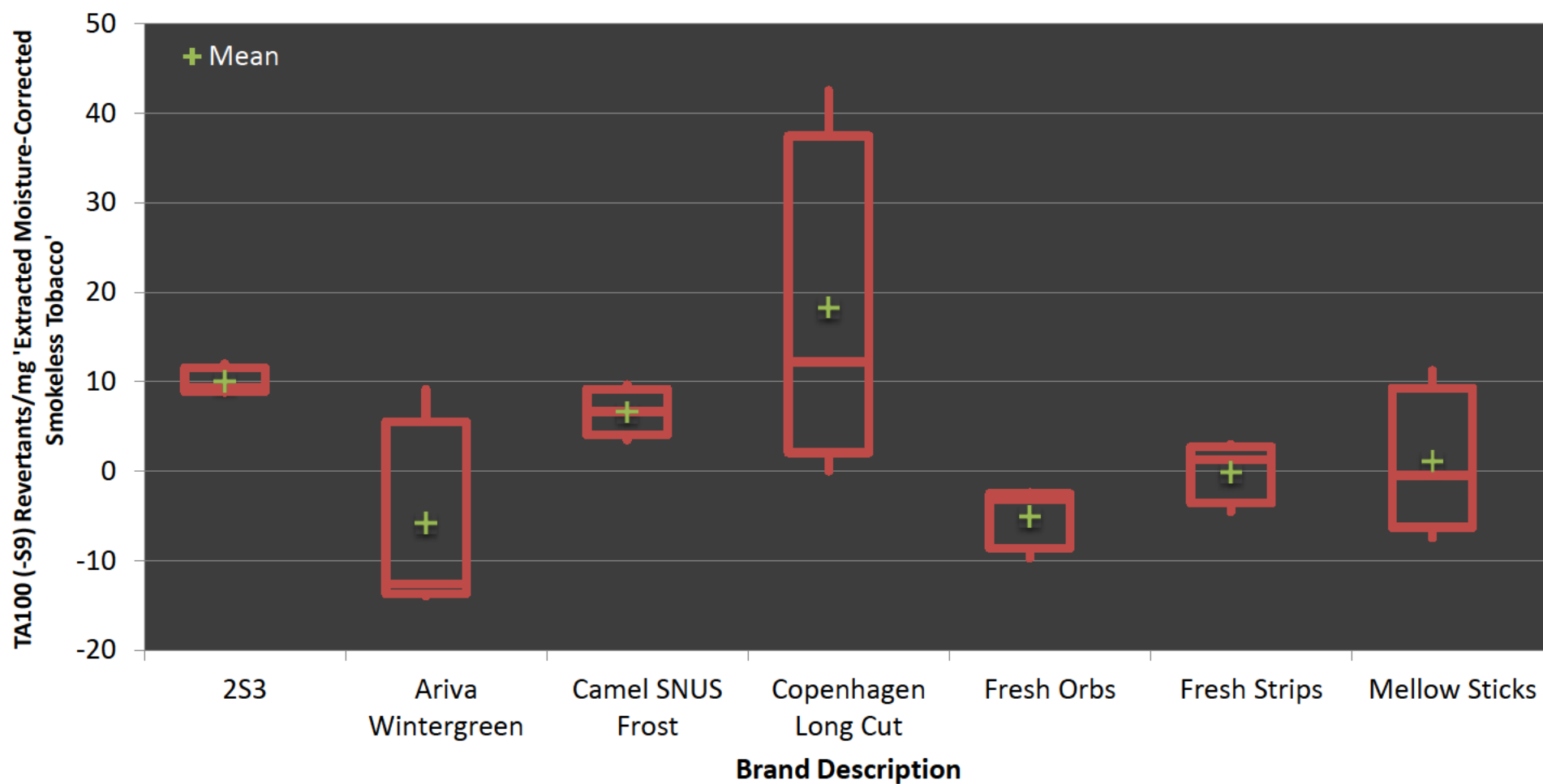
26 October 2009



Test Describe - Comparative

Performed by TA100 (-S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

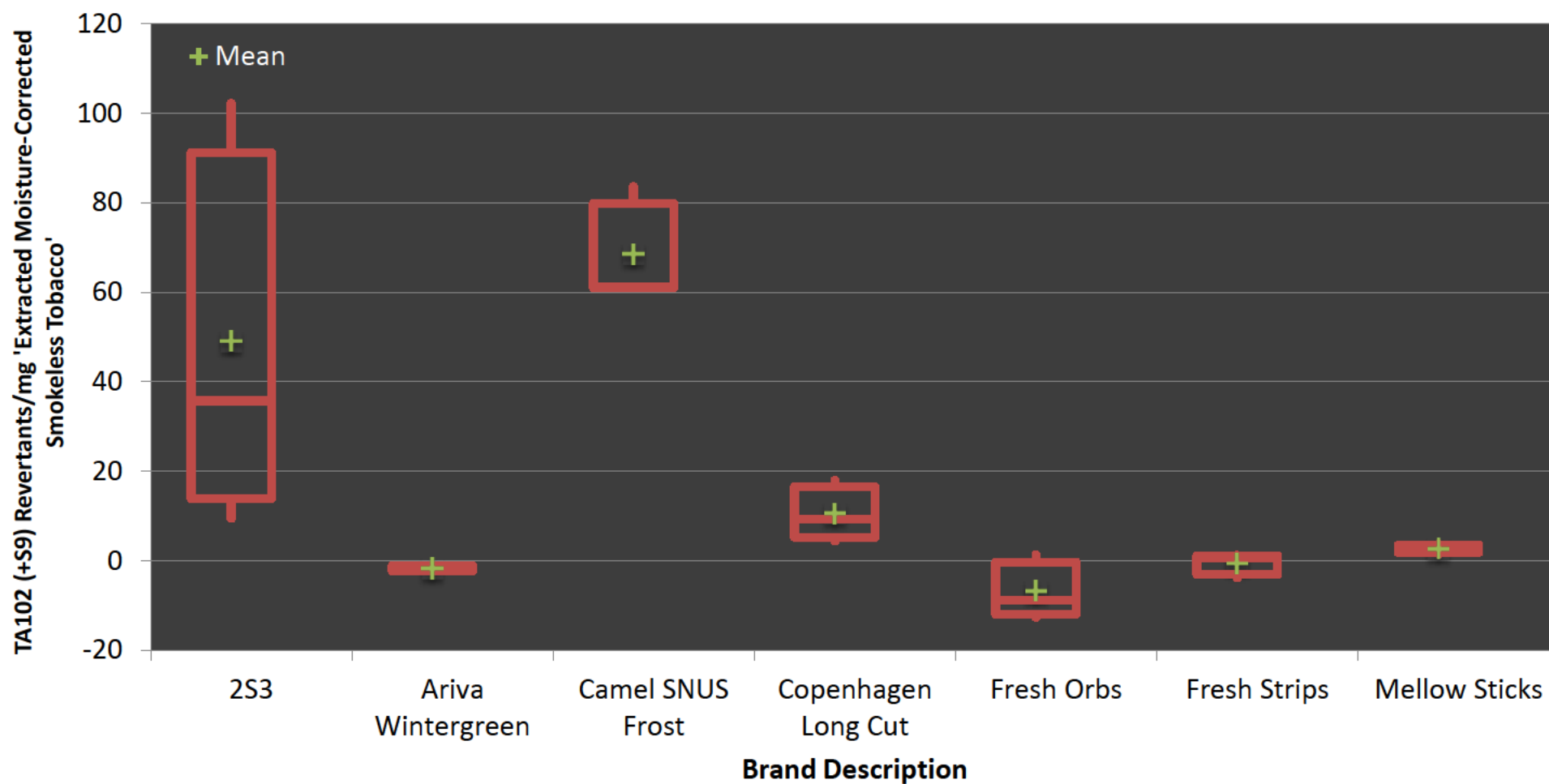
Date 26 October 2009



Test Describe - Comparative

Performed by TA102 (+S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

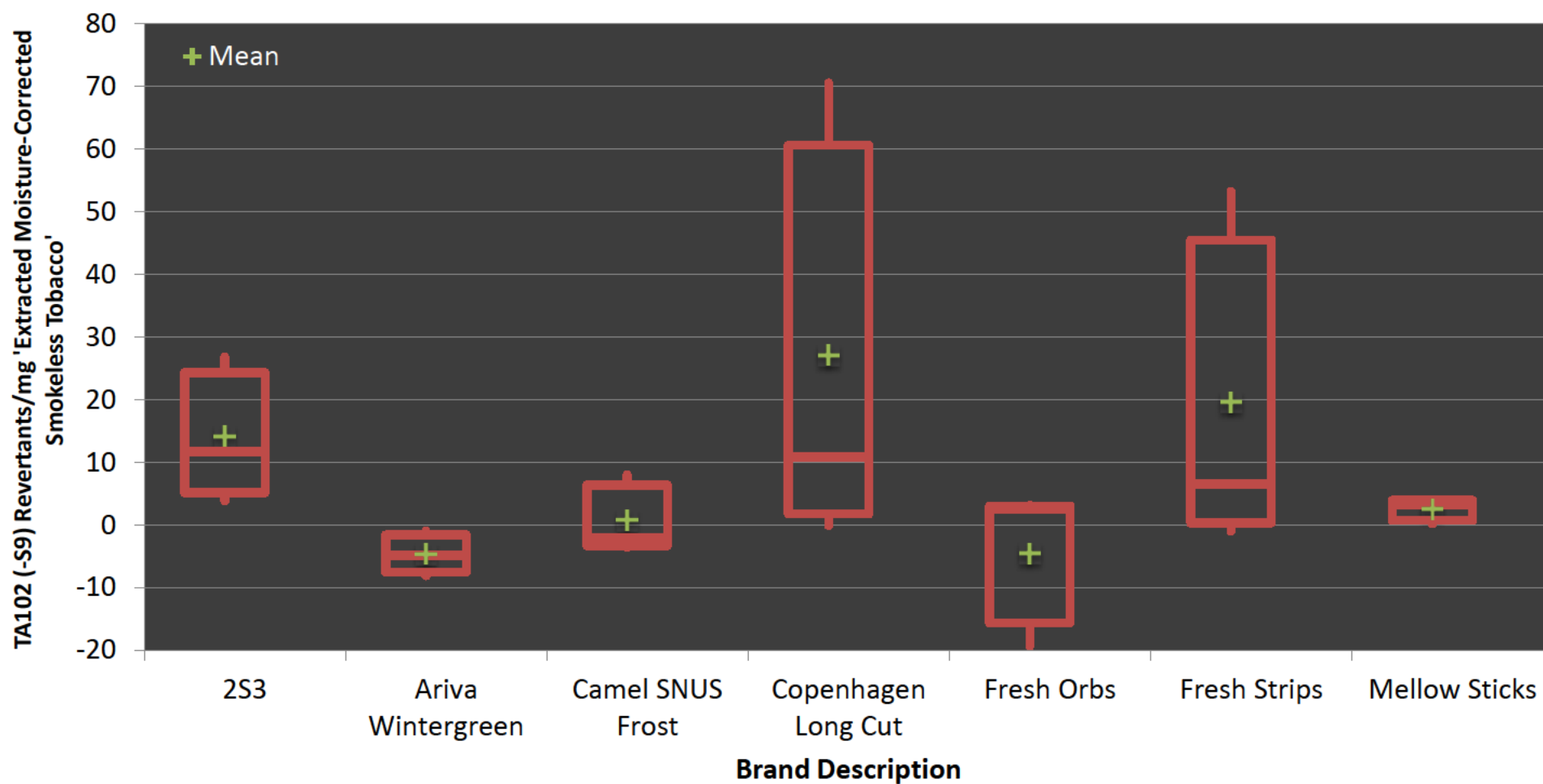
Date 26 October 2009



Test Describe - Comparative

Performed by TA102 (-S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

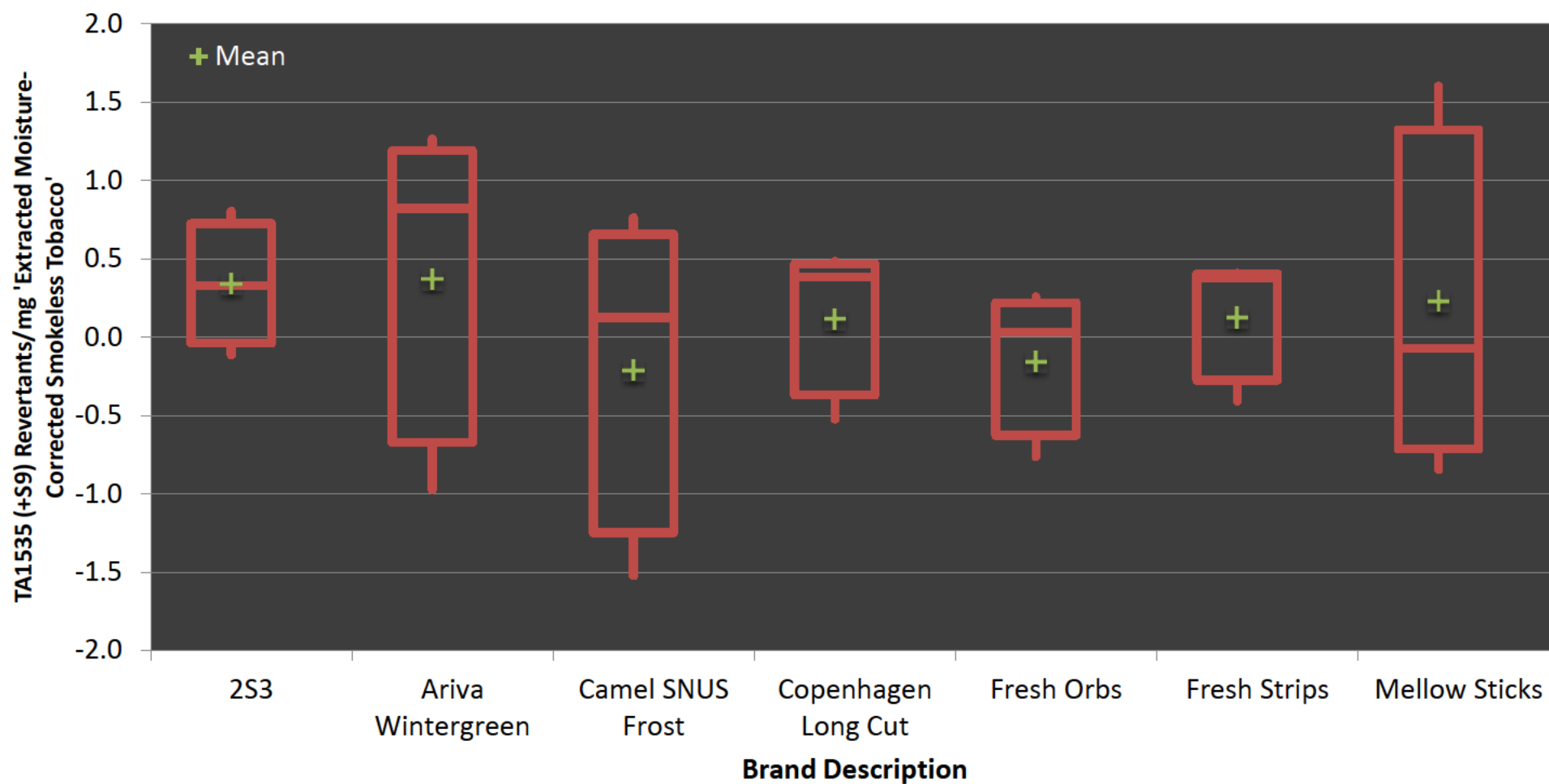
Date 26 October 2009



Test Describe - Comparative

Performed by TA1535 (+S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

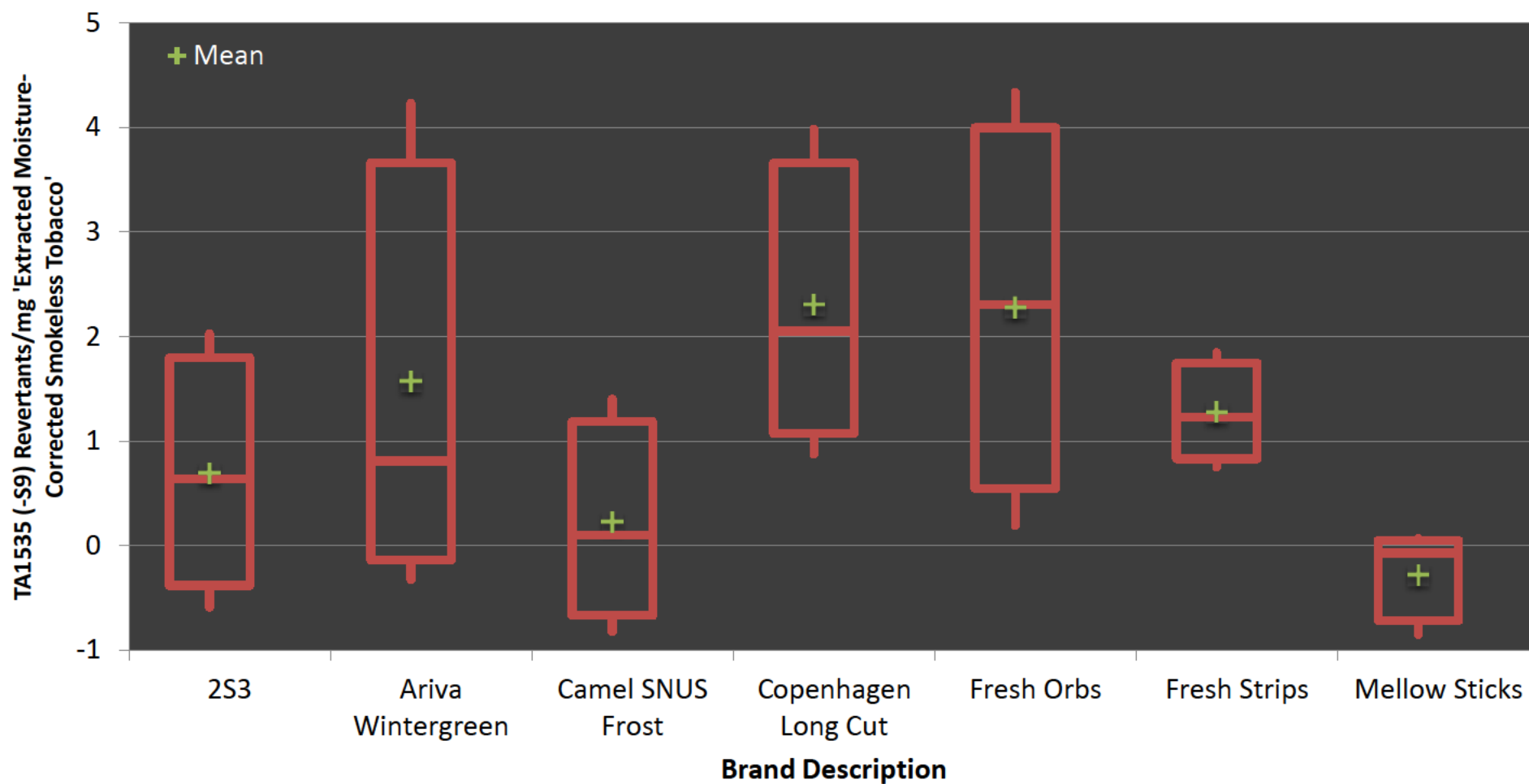
Date 26 October 2009



Test Describe - Comparative

Performed by TA1535 (-S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

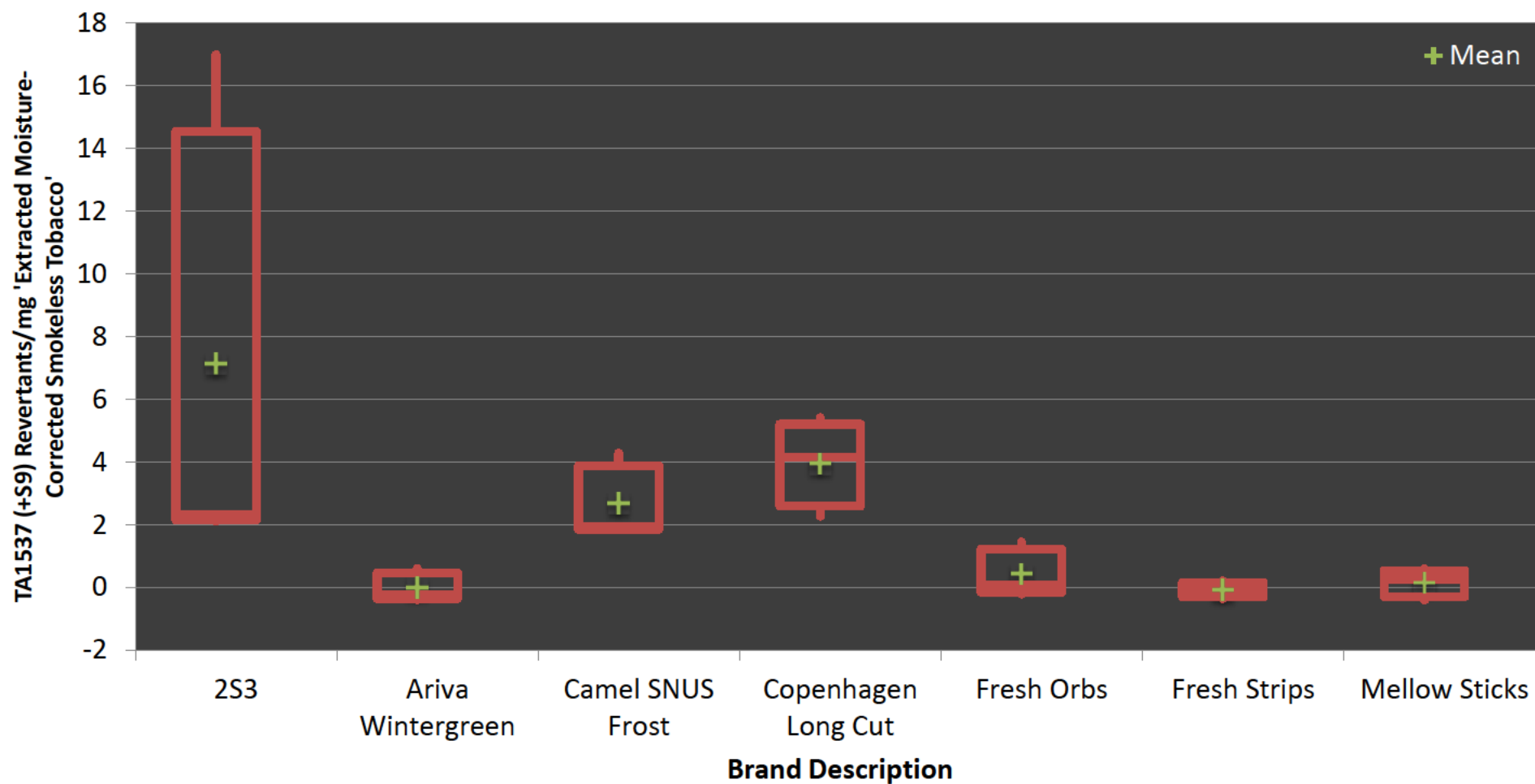
Date 26 October 2009



Test Describe - Comparative

Performed by TA1537 (+S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

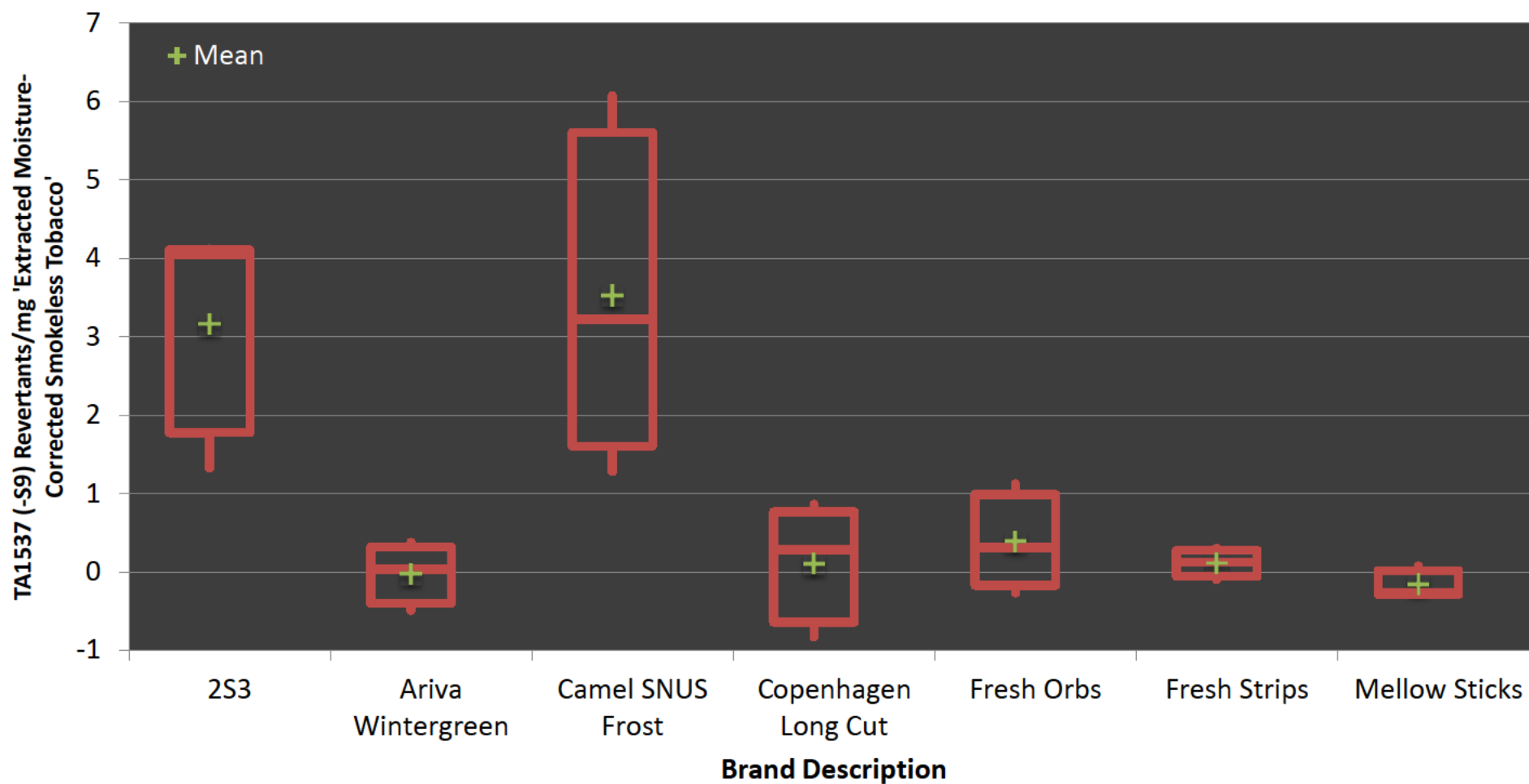
Date 26 October 2009



Test Describe - Comparative

Performed by TA1537 (-S9): Revertants/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' Slope by Brand
Wendy Wagstaff

Date 26 October 2009



Slope Analysis of the Linear Portion of the Dose-Response Curve for Smokeless (Revertant Colonies/ μ g 'Extracted Nicotine in DMSO') and Smoked (Revertant Colonies/ μ g 'Nicotine in CSC' (KR 2R4F)) Tobacco Products

Strain and S9 Activation	Sample ID	Sample Description	Revertant Colonies/ μ g 'Extracted Nicotine in DMSO' or Revertant Colonies/ μ g 'Nicotine in CSC' (KR 2R4F)											
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'Nic.' Slope Estimates					
			Dose Range		Dose Range		Dose Range		Standard		t-test p-value (H_0 : mean = 0)			
			(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	Mean	Error	95% C.I.	p-value	significance	
TA98 (+S9)	084396	KR 2R4F	0 - 9.4	18.118	0 - 9.4	31.609	0 - 9.4	28.653	26.127	4.094	8 51 - 43.742	0.024	significant	
TA98 (+S9)	084394	Camel SNUS Frost	0 - 63.8	0.063	0 - 71.5	0.127	0 - 67.2	-0.120	0.023	0.074	0* - 0.342	0.782	not significant	
TA98 (+S9)	084395	2S3	0 - 78	0.199	0 - 79.7	0.017	0 - 74.4	0.162	0.126	0.056	0* - 0.365	0.152	not significant	
TA98 (+S9)	084454	Fresh Strips	0 - 20	-0.106	0 - 21.6	0.124	0 - 11.1	-0.621	0*	0.220	0* - 0.747	0.458	not significant	
TA98 (+S9)	084455	Mellow Sticks	0 - 30.7	-0.189	0 - 29.1	0.002	0 - 30.9	0.193	0.002	0.110	0* - 0.477	0.987	not significant	
TA98 (+S9)	084456	Copenhagen Long Cut	0 - 64.6	0.235	0 - 66.3	0.226	0 - 67.7	0.144	0.202	0.029	0.076 - 0.327	0.020	significant	
TA98 (+S9)	084457	Ariva Wintergreen	0 - 29.5	0.061	0 - 30.8	-0.139	0 - 31.8	-0.177	0*	0.074	0* - 0.233	0.370	not significant	
TA98 (+S9)	084458	Fresh Orbs	0 - 13.1	-0.014	0 - 14.4	-0.246	0 - 7.7	1.591	0.444	0.577	0* - 2.928	0.523	not significant	
TA100 (+S9)	084396	KR 2R4F	0 - 18.8	8.207	0 - 18.8	9.973	0 - 18.8	11.541	9.907	0.963	5.76 - 14.051	0.009	significant	
TA100 (+S9)	084394	Camel SNUS Frost	0 - 16	0.116	0 - 17.9	1.050	0 - 16.8	1.528	0.898	0.414	0* - 2.681	0.163	not significant	
TA100 (+S9)	084395	2S3	0 - 15.6	0.881	0 - 15.9	1.982	0 - 14.9	0.852	1.238	0.372	0* - 2.839	0.080	not significant	
TA100 (+S9)	084454	Fresh Strips	0 - 5	5.250	0 - 10.8	2.772	0 - 5.5	3.314	3.779	0.752	0.542 - 7.015	0.037	significant	
TA100 (+S9)	084455	Mellow Sticks	0 - 15.3	2.282	0 - 7.3	3.560	0 - 15.4	1.491	2.445	0.603	0* - 5.037	0.056	not significant	
TA100 (+S9)	084456	Copenhagen Long Cut	0 - 32.3	1.172	0 - 16.6	2.143	0 - 16.9	1.568	1.628	0.282	0.415 - 2.841	0.029	significant	
TA100 (+S9)	084457	Ariva Wintergreen	0 - 5.9	5.725	0 - 30.8	0.498	0 - 7.9	2.067	2.763	1.549	0* - 9.426	0.216	not significant	
TA100 (+S9)	084458	Fresh Orbs	0 - 6.6	0.628	0 - 3.6	2.930	0 - 3.8	5.861	3.140	1.514	0* - 9.655	0.174	not significant	
TA102 (+S9)	084396	KR 2R4F	0 - 37.5	-0.248	0 - 37.5	1.030	0 - 37.5	1.580	0.787	0.541	0* - 3.117	0.283	not significant	
TA102 (+S9)	084394	Camel SNUS Frost	0 - 12.8	3.635	0 - 17.9	4.441	0 - 16.8	3.444	3.840	0.306	2.525 - 5.155	0.006	significant	
TA102 (+S9)	084395	2S3	0 - 15.6	3.351	0 - 79.7	0.305	0 - 18.6	1.229	1.629	0.902	0* - 5.508	0.213	not significant	
TA102 (+S9)	084454	Fresh Strips	0 - 20	0.309	0 - 21.6	-0.865	0 - 22.1	0.168	0*	0.370	0* - 1.463	0.760	not significant	
TA102 (+S9)	084455	Mellow Sticks	0 - 30.7	0.627	0 - 29.1	0.293	0 - 30.9	0.482	0.467	0.097	0.051 - 0.884	0.040	significant	
TA102 (+S9)	084456	Copenhagen Long Cut	0 - 64.6	0.691	0 - 66.3	0.168	0 - 67.7	0.343	0.401	0.154	0* - 1.063	0.121	not significant	
TA102 (+S9)	084457	Ariva Wintergreen	0 - 29.5	-0.423	0 - 30.8	-0.151	0 - 31.8	-0.296	0*	0.079	0* - 0.049	0.067	not significant	
TA102 (+S9)	084458	Fresh Orbs	0 - 13.1	-5.048	0 - 14.4	0.518	0 - 15.3	-3.032	0*	1.627	0* - 4.48	0.261	not significant	
TA1535 (+S9)	084396	KR 2R4F	0 - 37.5	0.186	0 - 37.5	0.077	0 - 37.5	0.110	0.124	0.032	0* - 0.263	0.062	not significant	
TA1535 (+S9)	084394	Camel SNUS Frost	0 - 63.8	0.007	0 - 71.5	0.041	0 - 67.2	-0.086	0*	0.038	0* - 0.15	0.770	not significant	
TA1535 (+S9)	084395	2S3	0 - 78	0.026	0 - 79.7	0.010	0 - 74.4	-0.004	0.011	0.009	0* - 0.049	0.335	not significant	
TA1535 (+S9)	084454	Fresh Strips	0 - 20	0.101	0 - 21.6	0.086	0 - 22.1	-0.091	0.032	0.062	0* - 0.297	0.656	not significant	
TA1535 (+S9)	084455	Mellow Sticks	0 - 30.7	-0.012	0 - 29.1	-0.152	0 - 15.4	0.271	0.036	0.124	0* - 0.57	0.801	not significant	
TA1535 (+S9)	084456	Copenhagen Long Cut	0 - 64.6	0.015	0 - 66.3	0.018	0 - 67.7	-0.019	0.005	0.012	0* - 0.056	0.738	not significant	
TA1535 (+S9)	084457	Ariva Wintergreen	0 - 29.5	0.230	0 - 30.8	0.143	0 - 31.8	-0.164	0.069	0.119	0* - 0.583	0.619	not significant	
TA1535 (+S9)	084458	Fresh Orbs	0 - 13.1	0.103	0 - 14.4	0.012	0 - 15.3	-0.262	0*	0.110	0* - 0.424	0.699	not significant	
TA1537 (+S9)	084396	KR 2R4F	0 - 18.8	3.985	0 - 9.4	4.206	0 - 9.4	4.526	4.239	0.157	3.56 - 4.914	0.001	significant	
TA1537 (+S9)	084394	Camel SNUS Frost	0 - 31.9	0.254	0 - 71.5	0.098	0 - 67.2	0.109	0.154	0.050	0* - 0.37	0.093	not significant	
TA1537 (+S9)	084395	2S3	0 - 19.5	0.557	0 - 79.7	0.074	0 - 74.4	0.073	0.235	0.161	0* - 0.928	0.282	not significant	
TA1537 (+S9)	084454	Fresh Strips	0 - 20	0.052	0 - 21.6	-0.020	0 - 22.1	-0.077	0*	0.037	0* - 0.146	0.727	not significant	
TA1537 (+S9)	084455	Mellow Sticks	0 - 30.7	-0.066	0 - 29.1	0.045	0 - 30.9	0.101	0.027	0.049	0* - 0.239	0.641	not significant	
TA1537 (+S9)	084456	Copenhagen Long Cut	0 - 32.3	0.208	0 - 33.2	0.155	0 - 67.7	0.084	0.149	0.036	0* - 0.304	0.054	not significant	
TA1537 (+S9)	084457	Ariva Wintergreen	0 - 29.5	-0.068	0 - 30.8	0.105	0 - 31.8	-0.039	0*	0.054	0* - 0.23	0.992	not significant	
TA1537 (+S9)	084458	Fresh Orbs	0 - 13.1	0.583	0 - 14.4	-0.073	0 - 15.3	0.022	0.177	0.205	0* - 1.058	0.478	not significant	

0*: Mean or lower bound of the 95% confidence interval has been truncated at 0.

Cigarette smoke condensate (CSC) test sample with μ g 'Nicotine in CSC'/plate dose basis

Slope Analysis of the Linear Portion of the Dose-Response Curve for Smokeless (Revertant Colonies/ μ g 'Extracted Nicotine in DMSO') and Smoked (Revertant Colonies/ μ g 'Nicotine in CSC' (KR 2R4F)) Tobacco Products

Strain and S9 Activation	Sample ID	Sample Description	Revertant Colonies/ μ g 'Extracted Nicotine in DMSO' or Revertant Colonies/ μ g 'Nicotine in CSC' (KR 2R4F)											
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'Nic.' Slope Estimates					
			Dose Range		Dose Range		Dose Range		Standard		t-test p-value (H_0 : mean = 0)			
			(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	Mean	Error	95% C.I.	p-value	significance	
TA98 (-S9)	084396	KR 2R4F	0 - 37.5	0.829	0 - 37.5	1.310	0 - 37.5	0.674	0.938	0.192	0.113 - 1.762	0.039	significant	
TA98 (-S9)	084394	Camel SNUS Frost	0 - 63.8	-0.024	0 - 71.5	0.085	0 - 33.6	0.000	0.020	0.033	0* - 0.162	0.601	not significant	
TA98 (-S9)	084395	2S3	0 - 78	0.035	0 - 79.7	-0.040	0 - 37.2	-0.022	0*	0.023	0* - 0.088	0.731	not significant	
TA98 (-S9)	084454	Fresh Strips	0 - 20	0.245	0 - 21.6	-0.021	0 - 22.1	0.230	0.151	0.086	0* - 0.522	0.221	not significant	
TA98 (-S9)	084455	Mellow Sticks	0 - 30.7	0.270	0 - 29.1	0.212	0 - 30.9	0.196	0.226	0.023	0.129 - 0.323	0.010	significant	
TA98 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	0.014	0 - 66.3	0.017	0 - 67.7	0.044	0.025	0.010	0* - 0.066	0.123	not significant	
TA98 (-S9)	084457	Ariva Wintergreen	0 - 29.5	-0.067	0 - 15.4	0.240	0 - 31.8	0.110	0.094	0.089	0* - 0.477	0.401	not significant	
TA98 (-S9)	084458	Fresh Orbs	0 - 13.1	-0.012	0 - 14.4	0.165	0 - 15.3	-0.011	0.047	0.059	0* - 0.301	0.505	not significant	
TA100 (-S9)	084396	KR 2R4F	0 - 9.4	4.450	0 - 9.4	3.677	0 - 18.8	1.966	3.364	0.734	0.208 - 6.521	0.044	significant	
TA100 (-S9)	084394	Camel SNUS Frost	0 - 63.8	0.210	0 - 71.5	0.355	0 - 67.2	0.547	0.371	0.098	0* - 0.791	0.063	not significant	
TA100 (-S9)	084395	2S3	0 - 39	0.290	0 - 79.7	0.299	0 - 74.4	0.413	0.334	0.039	0.164 - 0.504	0.014	significant	
TA100 (-S9)	084454	Fresh Strips	0 - 20	-1.111	0 - 21.6	0.290	0 - 11.1	0.671	0*	0.542	0* - 2.282	0.935	not significant	
TA100 (-S9)	084455	Mellow Sticks	0 - 15.3	1.917	0 - 29.1	-0.080	0 - 30.9	-1.255	0.194	0.926	0* - 4.178	0.854	not significant	
TA100 (-S9)	084456	Copenhagen Long Cut	0 - 32.3	1.634	0 - 33.2	0.003	0 - 33.8	0.448	0.695	0.487	0* - 2.789	0.290	not significant	
TA100 (-S9)	084457	Ariva Wintergreen	0 - 29.5	1.663	0 - 30.8	-2.186	0 - 31.8	-2.339	0*	1.309	0* - 4.68	0.542	not significant	
TA100 (-S9)	084458	Fresh Orbs	0 - 13.1	-1.250	0 - 14.4	-3.537	0 - 15.3	-0.813	0*	0.845	0* - 1.767	0.158	not significant	
TA102 (-S9)	084396	KR 2R4F	0 - 37.5	-0.731	0 - 9.4	2.606	0 - 37.5	0.485	0.786	0.975	0* - 4.982	0.505	not significant	
TA102 (-S9)	084394	Camel SNUS Frost	0 - 63.8	-0.212	0 - 35.7	0.427	0 - 67.2	-0.117	0.033	0.199	0* - 0.89	0.885	not significant	
TA102 (-S9)	084395	2S3	0 - 78	0.127	0 - 79.7	0.376	0 - 74.4	0.923	0.475	0.235	0* - 1.486	0.180	not significant	
TA102 (-S9)	084454	Fresh Strips	0 - 20	-0.223	0 - 21.6	1.500	0 - 5.5	11.888	4.388	3.783	0* - 20.664	0.366	not significant	
TA102 (-S9)	084455	Mellow Sticks	0 - 15.3	0.687	0 - 29.1	0.595	0 - 30.9	0.041	0.441	0.202	0* - 1.309	0.161	not significant	
TA102 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	-0.002	0 - 66.3	0.408	0 - 33.8	2.587	0.998	0.803	0* - 4.455	0.340	not significant	
TA102 (-S9)	084457	Ariva Wintergreen	0 - 29.5	-0.871	0 - 30.8	-1.401	0 - 31.8	-0.152	0*	0.362	0* - 0.748	0.155	not significant	
TA102 (-S9)	084458	Fresh Orbs	0 - 13.1	-7.725	0 - 14.4	0.930	0 - 15.3	1.099	0*	2.913	0* - 10.637	0.581	not significant	
TA1535 (-S9)	084396	KR 2R4F	0 - 37.5	0.017	0 - 37.5	0.121	0 - 37.5	0.026	0.055	0.033	0* - 0.198	0.240	not significant	
TA1535 (-S9)	084394	Camel SNUS Frost	0 - 63.8	0.006	0 - 71.5	0.074	0 - 67.2	-0.046	0.011	0.035	0* - 0.162	0.776	not significant	
TA1535 (-S9)	084395	2S3	0 - 78	-0.019	0 - 79.7	0.020	0 - 74.4	0.070	0.024	0.026	0* - 0.134	0.455	not significant	
TA1535 (-S9)	084454	Fresh Strips	0 - 10	0.186	0 - 10.8	0.422	0 - 11.1	0.275	0.295	0.069	0* - 0.59	0.050	not significant	
TA1535 (-S9)	084455	Mellow Sticks	0 - 30.7	-0.144	0 - 29.1	0.013	0 - 30.9	-0.011	0*	0.049	0* - 0.162	0.432	not significant	
TA1535 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	0.034	0 - 66.3	0.077	0 - 33.8	0.146	0.086	0.033	0* - 0.226	0.120	not significant	
TA1535 (-S9)	084457	Ariva Wintergreen	0 - 7.4	0.769	0 - 30.8	0.141	0 - 31.8	-0.054	0.285	0.249	0* - 1.355	0.370	not significant	
TA1535 (-S9)	084458	Fresh Orbs	0 - 3.3	1.741	0 - 7.2	0.842	0 - 15.3	0.067	0.884	0.484	0* - 2.965	0.209	not significant	
TA1537 (-S9)	084396	KR 2R4F	0 - 18.8	0.196	0 - 18.8	0.231	0 - 9.4	0.523	0.317	0.104	0* - 0.763	0.092	not significant	
TA1537 (-S9)	084394	Camel SNUS Frost	0 - 16	0.361	0 - 71.5	0.068	0 - 33.6	0.182	0.204	0.085	0* - 0.571	0.140	not significant	
TA1537 (-S9)	084395	2S3	0 - 78	0.133	0 - 39.9	0.132	0 - 37.2	0.045	0.103	0.029	0* - 0.228	0.070	not significant	
TA1537 (-S9)	084454	Fresh Strips	0 - 20	-0.024	0 - 21.6	0.069	0 - 22.1	0.028	0.024	0.027	0* - 0.14	0.458	not significant	
TA1537 (-S9)	084455	Mellow Sticks	0 - 30.7	0.013	0 - 29.1	-0.053	0 - 30.9	-0.044	0*	0.020	0* - 0.06	0.304	not significant	
TA1537 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	0.011	0 - 66.3	-0.031	0 - 67.7	0.032	0.004	0.018	0* - 0.083	0.854	not significant	
TA1537 (-S9)	084457	Ariva Wintergreen	0 - 29.5	0.006	0 - 30.8	-0.085	0 - 31.8	0.063	0*	0.043	0* - 0.181	0.914	not significant	
TA1537 (-S9)	084458	Fresh Orbs	0 - 6.6	0.452	0 - 14.4	0.112	0 - 15.3	-0.093	0.157	0.159	0* - 0.84	0.426	not significant	

0*: Mean or lower bound of the 95% confidence interval has been truncated at 0.

Cigarette smoke condensate (CSC) test sample with μ g 'Nicotine in CSC'/plate dose basis

**One-Way ANOVA of Mean 'Extracted Nicotine' and 'Nicotine in CSC'
Slope Estimates Among Test Samples**

TA98 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	1782.6084	7	254.65834	39.5	0.000
Within Samples	103.02679	16	6.4391745		
Total (Corr.)	1216.5009	23			

TA98 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	2.0611403	7	0.2944486	13.6	0.000
Within Samples	0.34615	16	0.0216344		
Total (Corr.)	2.4072903	23			

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	173.10833	7	24.729762	9.51	0.000
Within Samples	41.623451	16	2.6014657		
Total (Corr.)	142.55837	23			

TA100 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	47.82619	7	6.8323129	4.17	0.009
Within Samples	26.190404	16	1.6369003		
Total (Corr.)	74.016594	23			

TA102 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	67.985595	7	9.7122278	6.44	0.001
Within Samples	24.138367	16	1.508648		
Total (Corr.)	90.958932	23			

TA102 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	69.345731	7	9.906533	1.07	0.425
Within Samples	147.95201	16	9.2470009		
Total (Corr.)	217.29774	23			

TA1535 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.058412	7	0.0083446	0.461	0.848
Within Samples	0.2893065	16	0.0180817		
Total (Corr.)	0.3405169	23			

TA1535 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	1.9366563	7	0.2766652	2.40	0.069
Within Samples	1.8414342	16	0.1150896		
Total (Corr.)	3.7780905	23			

TA1537 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	45.058986	7	6.4369979	167	0.000
Within Samples	0.6180467	16	0.0386279		
Total (Corr.)	29.763859	23			

TA1537 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.3102492	7	0.0443213	2.49	0.062
Within Samples	0.2843007	16	0.0177688		
Total (Corr.)	0.59455	23			

One-way ANOVA analysis indicates significant differences (at $\alpha = 0.05$) among mean 'Nicotine' specific activity slope estimates for test samples with TA98(+S9), TA98(-S9), TA100(+S9), TA100(-S9), TA102(+S9) and TA1537(+S9).

**Evaluation of Ratio (Max ÷ Min) of Standard Deviations of
'Extracted Nicotine' and 'Nicotine in CSC' Slope Estimates
and Corresponding Method of Comparison**

Strain and S9 Activation	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	140.4	Pairwise T-test (unequal variance)
TA98 (-S9)	20.0	Pairwise T-test (unequal variance)
TA100 (+S9)	5.5	ANOVA (equal variance)
TA100 (-S9)	33.2	Pairwise T-test (unequal variance)
TA102 (+S9)	20.7	Pairwise T-test (unequal variance)
TA102 (-S9)	19.0	Pairwise T-test (unequal variance)
TA1535 (+S9)	14.2	ANOVA (equal variance)
TA1535 (-S9)	18.8	Pairwise T-test (unequal variance)
TA1537 (+S9)	5.7	ANOVA (equal variance)
TA1537 (-S9)	8.6	ANOVA (equal variance)

**ANOVA-Based Comparisons of Smokeless Tobacco Mean 'Extracted Nicotine' Slope to Control Brand KR 2R4F (084396)
Mean 'Nicotine in CSC' Slope using Bonferroni-adjusted p-values**

ANOVA-Based Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	158.73	1.0E-09	significant	46.799	4.0E-06	significant	9.2648	0.0077	not significant	1.5546	0.2304	not significant	648.03	2.3E-14	significant
084395 vs. 084396	157.48	1.1E-09	significant	43.335	6.3E-06	significant	0.7037	0.4139	not significant	1.0634	0.3178	not significant	622.57	3.1E-14	significant
084454 vs. 084396	161.46	8.9E-10	significant	21.656	2.6E-04	significant	0.8357	0.3742	not significant	0.7065	0.4130	not significant	702.65	1.2E-14	significant
084455 vs. 084396	158.99	1.0E-09	significant	32.111	3.5E-05	significant	0.1019	0.7537	not significant	0.6490	0.4323	not significant	688.91	1.4E-14	significant
084456 vs. 084396	156.56	1.1E-09	significant	39.527	1.1E-05	significant	0.1487	0.7048	not significant	1.1874	0.2920	not significant	649.50	2.2E-14	significant
084457 vs. 084396	160.05	9.5E-10	significant	29.428	5.6E-05	significant	1.1541	0.2986	not significant	0.2485	0.6249	not significant	697.91	1.3E-14	significant
084458 vs. 084396	153.66	1.3E-09	significant	26.409	9.9E-05	significant	10.879	0.0045	significant	2.4898	0.1342	not significant	640.62	2.5E-14	significant

ANOVA-Based Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	58.363	1.0E-06	significant	8.2139	0.0112	not significant	0.0922	0.7653	not significant	0.0247	0.8772	not significant	1.081	0.3139	not significant
084395 vs. 084396	62.137	6.7E-07	significant	8.4154	0.0104	not significant	0.0157	0.9019	not significant	0.0127	0.9117	not significant	3.849	0.0674	not significant
084454 vs. 084396	42.883	6.7E-06	significant	10.683	0.0048	significant	2.1045	0.1662	not significant	0.7487	0.3997	not significant	7.220	0.0162	not significant
084455 vs. 084396	35.130	2.1E-05	significant	9.2118	0.0079	not significant	0.0194	0.8910	not significant	0.1365	0.7166	not significant	10.043	0.0060	significant
084456 vs. 084396	57.798	1.1E-06	significant	6.5308	0.0212	not significant	0.0072	0.9332	not significant	0.0123	0.9131	not significant	8.272	0.0110	not significant
084457 vs. 084396	49.338	2.9E-06	significant	17.088	0.0008	significant	0.4125	0.5298	not significant	0.6914	0.4179	not significant	8.760	0.0092	not significant
084458 vs. 084396	54.968	1.5E-06	significant	25.079	0.0001	significant	1.1696	0.2955	not significant	8.9507	0.0086	not significant	2.155	0.1615	not significant

Some ANOVA-based comparison p-values for tester strains TA98(+S9), TA100(+S9), TA102(+S9), TA1537(+S9), TA98(-S9), TA100(-S9) and TA1537(-S9) were significant at $\alpha = 0.05$.

Significant differences between the mean 'Nicotine in CSC' specific activity slope of the KR 2R4F control sample and the mean 'Extracted Nicotine' specific activity slope of the various smokeless tobacco test samples are summarized below:

TA98(+S9), TA100(+S9), TA1537(+S9) and TA98(-S9):

- KR 2R4F (084396) specific activity is significantly different from that of each of the 7 smokeless tobacco test samples

TA102(+S9)

- KR 2R4F (084396) and Fresh Orbs (084458)

TA100(-S9)

- KR 2R4F (084396) and each of {Fresh Strips (084454), Ariva Wintergreen (084457), Fresh Orbs (084458)}

TA1537(-S9)

- KR 2R4F (084396) and Mellow Sticks (084455)

**Pairwise T-test Comparisons of Smokeless Tobacco Mean 'Extracted Nicotine' Slope to Control Brand KR 2R4F (084396)
Mean 'Nicotine in CSC' Slope using Bonferroni-adjusted p-values**

Pairwise T-test Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	6.375	0.0031	significant				4.911	0.0080	not significant						
084395 vs. 084396	6.350	0.0032	significant				0.800	0.4686	not significant						
084454 vs. 084396	6.421	0.0030	significant				1.398	0.2347	not significant						
084455 vs. 084396	6.379	0.0031	significant				0.582	0.5918	not significant						
084456 vs. 084396	6.332	0.0032	significant				0.687	0.5297	not significant						
084457 vs. 084396	6.401	0.0031	significant				1.969	0.1203	not significant						
084458 vs. 084396	6.212	0.0034	significant				1.929	0.1260	not significant						

Pairwise T-test Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084396	4.720	0.0092	not significant	4.045	0.0155	not significant	0.758	0.4909	not significant	0.902	0.4182	not significant			
084395 vs. 084396	4.908	0.0080	not significant	4.124	0.0146	not significant	0.310	0.7719	not significant	0.743	0.4989	not significant			
084454 vs. 084396	3.744	0.0200	not significant	3.743	0.0201	not significant	0.922	0.4087	not significant	3.138	0.0349	not significant			
084455 vs. 084396	3.690	0.0210	not significant	2.684	0.0550	not significant	0.347	0.7459	not significant	1.738	0.1572	not significant			
084456 vs. 084396	4.760	0.0089	not significant	3.032	0.0387	not significant	0.167	0.8752	not significant	0.658	0.5462	not significant			
084457 vs. 084396	3.994	0.0162	not significant	2.877	0.0451	not significant	1.533	0.2000	not significant	0.919	0.4103	not significant			
084458 vs. 084396	4.443	0.0113	not significant	4.676	0.0095	not significant	0.874	0.4314	not significant	1.709	0.1626	not significant			

Some pairwise t-test comparison p-values for tester strain TA98(+S9) were significant at $\alpha = 0.05$.

Significant differences between the mean 'Nicotine in CSC' specific activity slope of the KR 2R4F control sample and the mean 'Extracted Nicotine' specific activity slope of the various smokeless tobacco test samples are summarized below:

TA98 (+S9):

- KR 2R4F (084396) specific activity is significantly different from that of each of the 7 smokeless tobacco test samples

**Number of Mean 'Nicotine' Slope Estimates (Including Control Brand KR 2R4F)
Significantly Greater than Zero (0), the Corresponding Number of Paired
Comparisons and Comparison Method**

Strain and S9 Activation	# Significant Slopes (Including KR 2R4F)	Number of Comparisons	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	2	1	140.4	Pairwise T-test (unequal variance)
TA98 (-S9)	2	1	8.5	ANOVA (equal variance)
TA100 (+S9)	3	2	3.4	ANOVA (equal variance)
TA100 (-S9)	2	1	18.6	Pairwise T-test (unequal variance)
TA102 (+S9)	0	0		
TA102 (-S9)	0	0		
TA1535 (+S9)	0	0		
TA1535 (-S9)	0	0		
TA1537 (+S9)	1	0		
TA1537 (-S9)	0	0		

One-Way ANOVA and ANOVA-Based Comparisons of Mean 'Nicotine' Slope Estimates Between KR 2R4F and Smokeless Tobacco Samples that are Significantly Greater than Zero (0)

TA98 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	1008.14	1	1008.14	40.1	0.003
Within Samples	100.58	4	25.14		

TA98 (+S9)			
Pairwise T-test Comparison	t-statistic	p-value	significance at $\alpha = 0.05$
084456 vs. 084396	6.33	0.0032	significant

TA98 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.760	1	0.760	13.6	0.021
Within Samples	0.223	4	0.056		

TA98 (-S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084455 vs. 084396	13.62	0.0210	significant

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	110.74	2	55.37	35.2	0.000
Within Samples	9.44	6	1.57		

TA100 (+S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084454 vs. 084396	35.82	0.0010	significant
084456 vs. 084396	65.38	0.0002	significant

TA100 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	13.78	1	13.78	17.0	0.015
Within Samples	3.24	4	0.81		

TA100 (-S9)			
Pairwise T-test Comparison	t-statistic	p-value	significance at $\alpha = 0.05$
084395 vs. 084396	4.12	0.0146	significant

Each of TA98 (+S9), TA98 (-S9), TA100 (+S9) and TA100 (-S9) strains have the mean 'nicotine in CSC' specific activity slope of the KR 2R4F and at least one smokeless tobacco test sample mean 'extracted nicotine' specific activity slope estimate being greater than zero (0) .

TA98 (+S9):

A significant difference between mean 'Nicotine' specific activity slope estimates was detected in TA98 (+S9) between **KR 2R4F** and **084456 (Copenhagen Long Cut)**

TA98 (-S9):

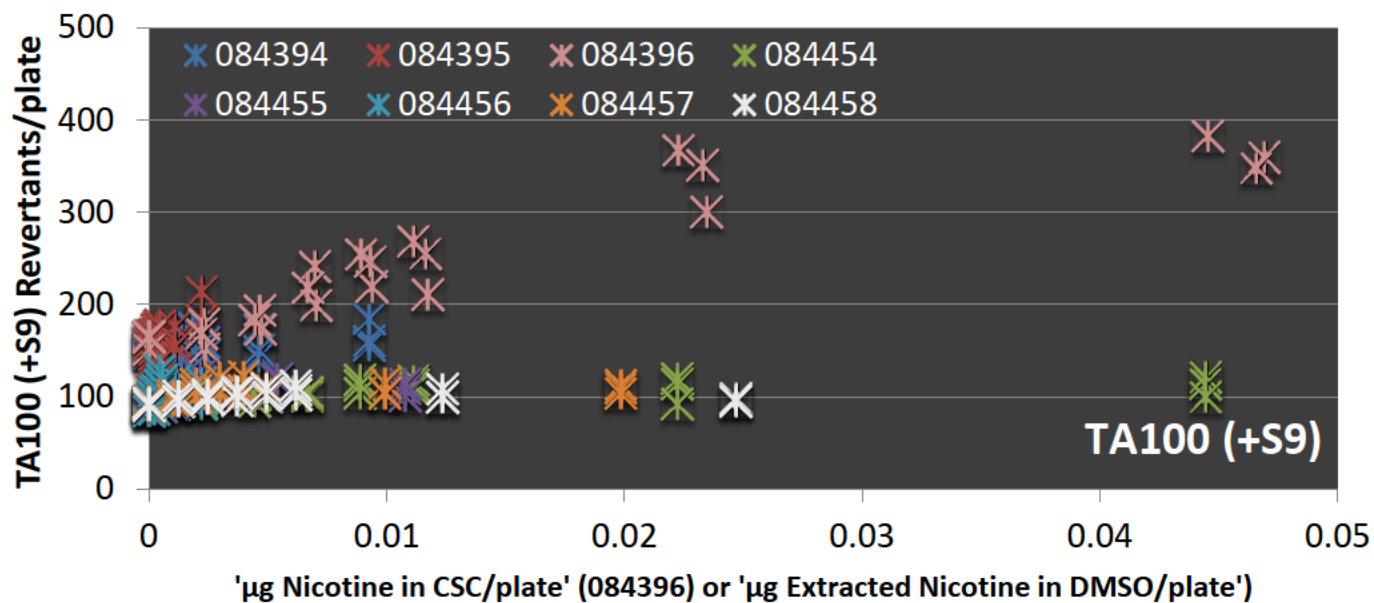
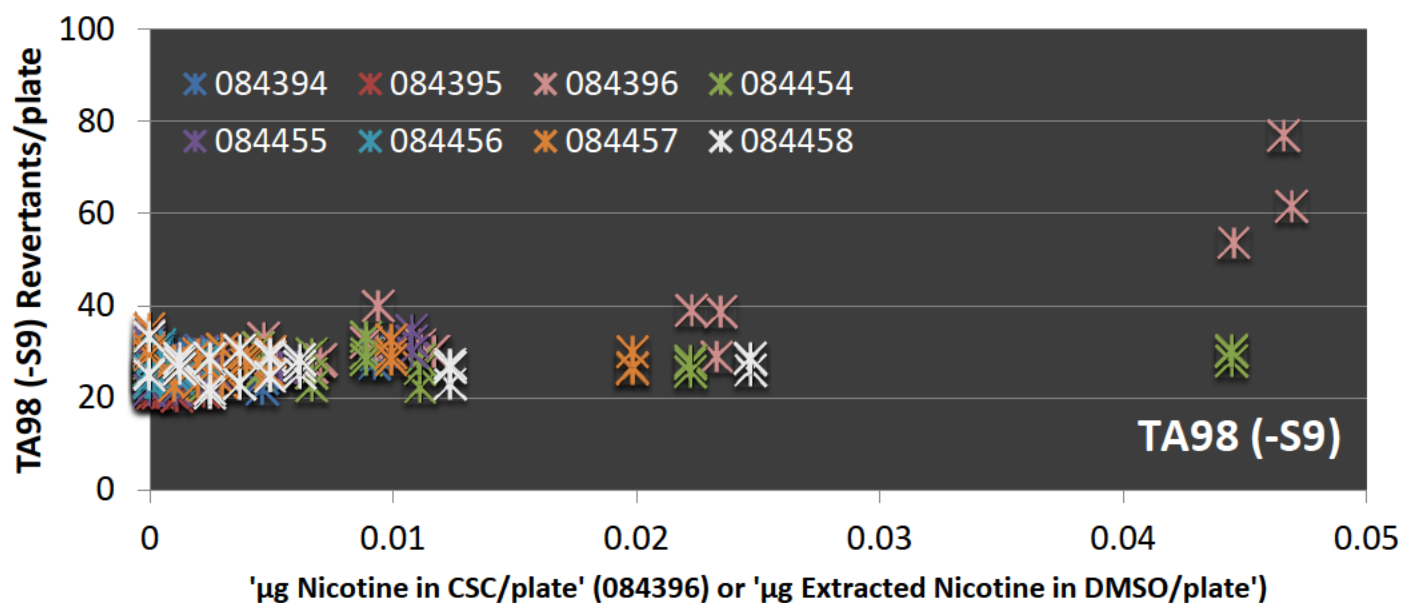
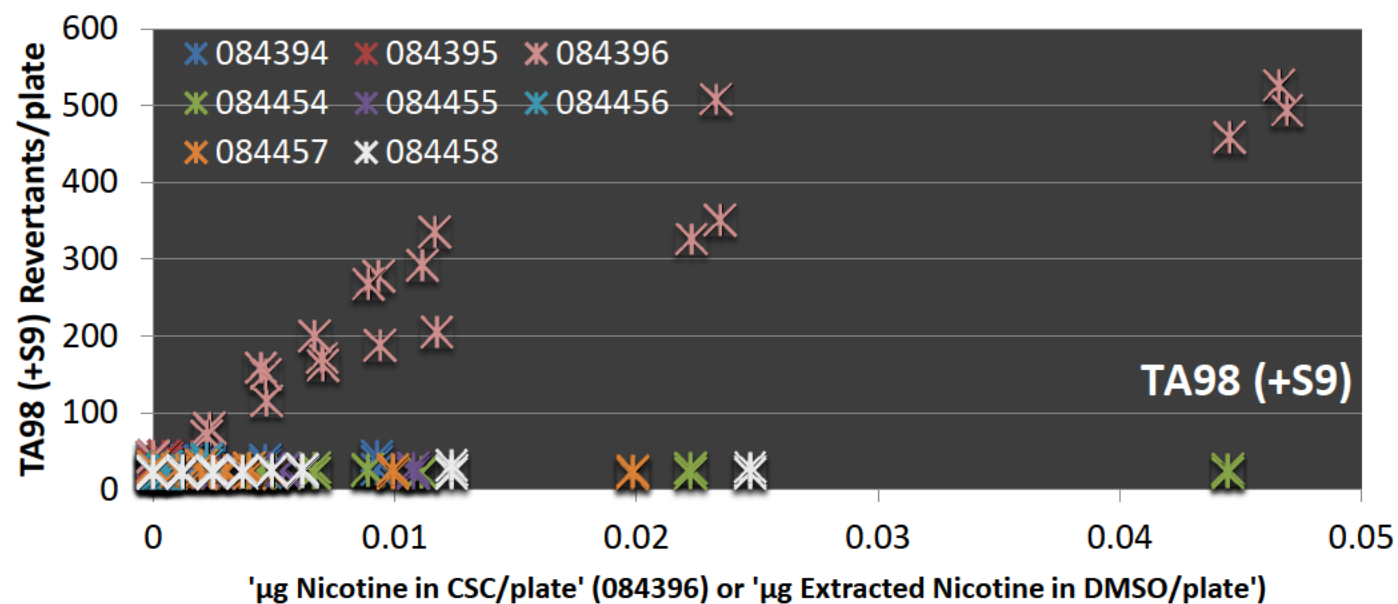
A significant difference between mean 'Nicotine' specific activity slope estimates was detected in TA98 (-S9) between **KR 2R4F** and **084455 (Mellow Sticks)**

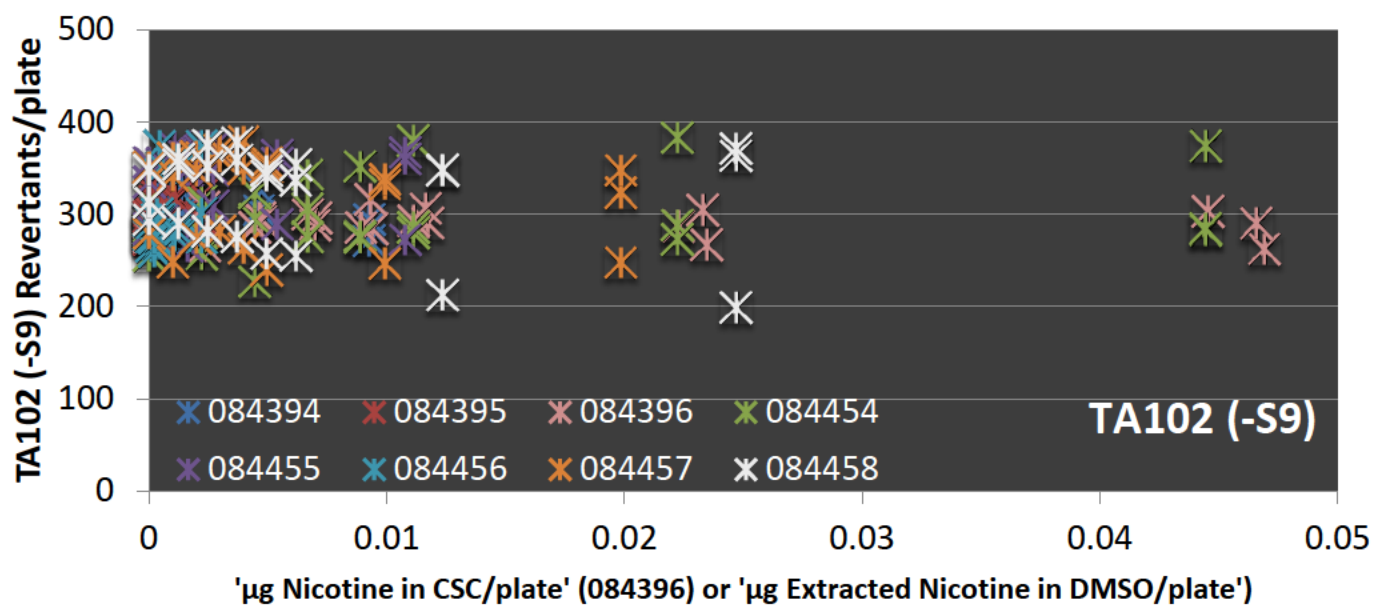
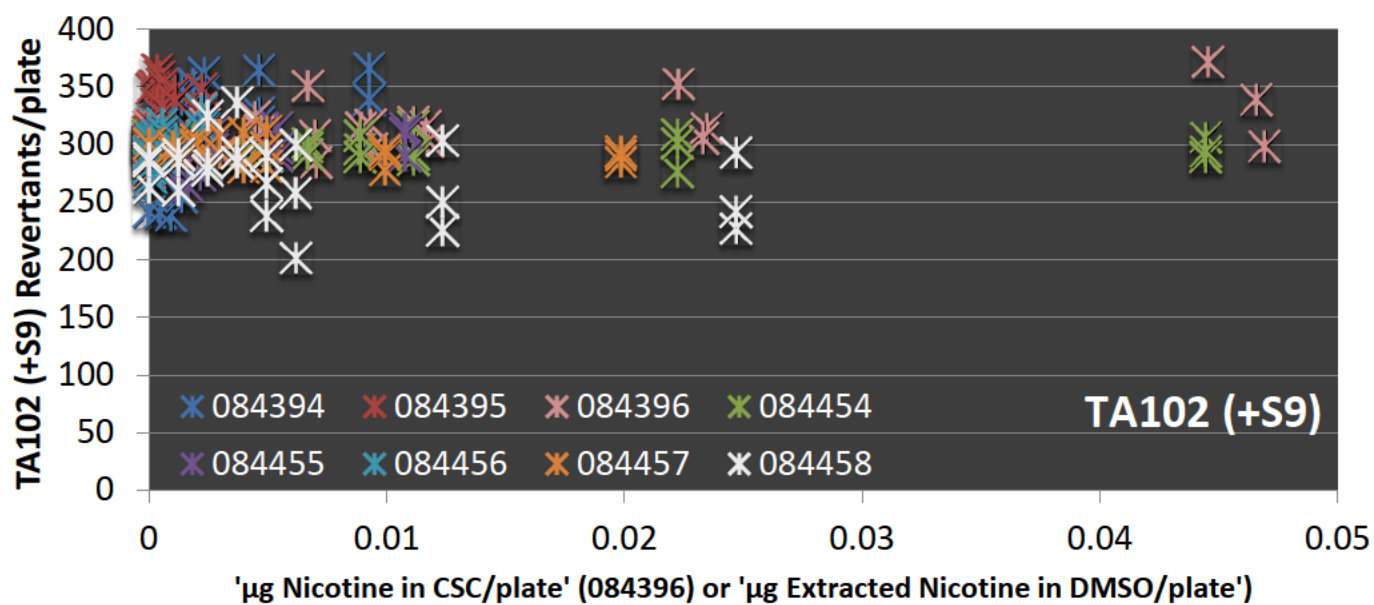
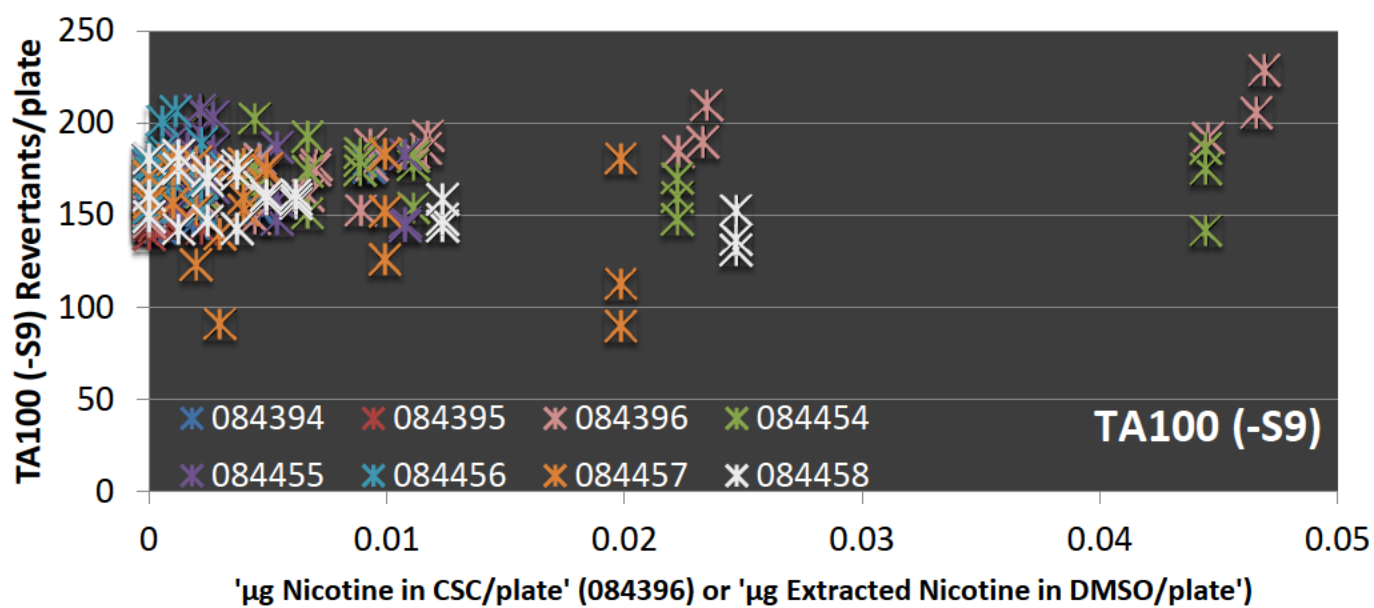
TA100 (+S9)

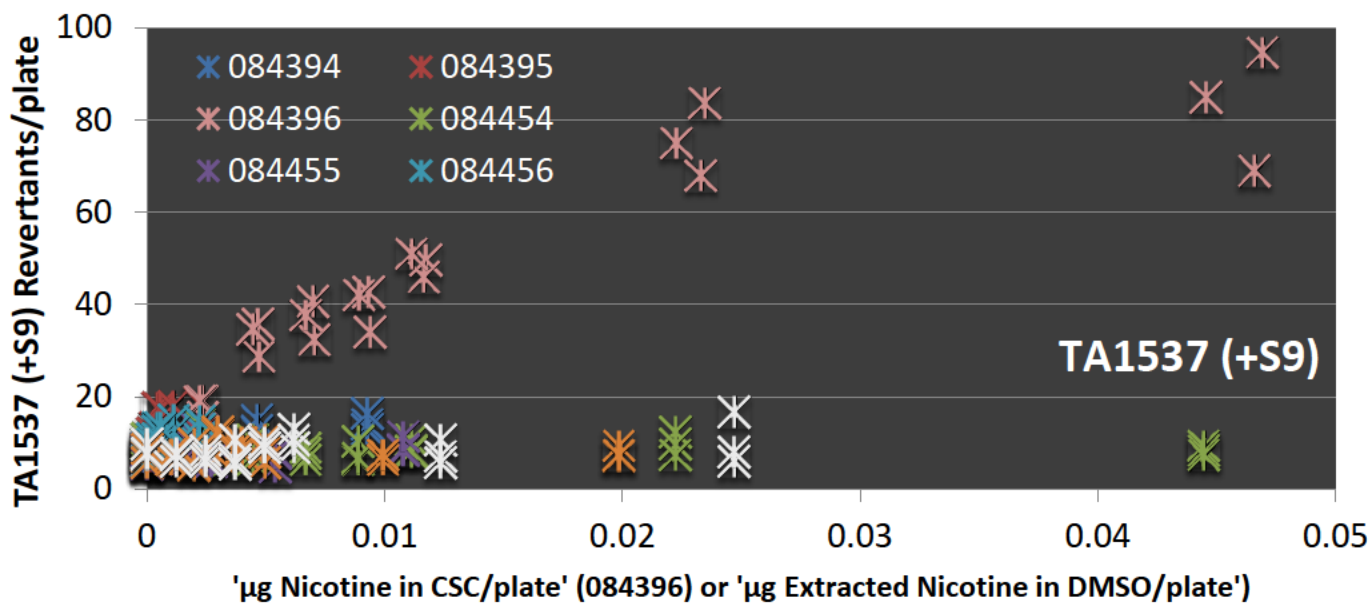
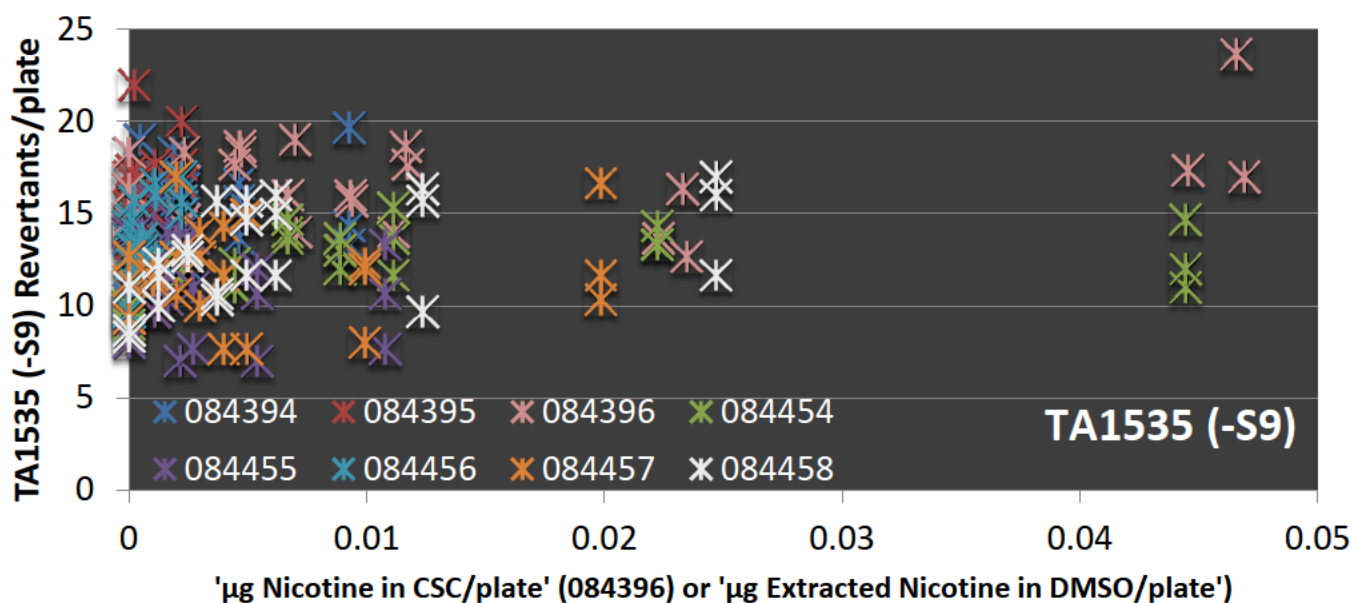
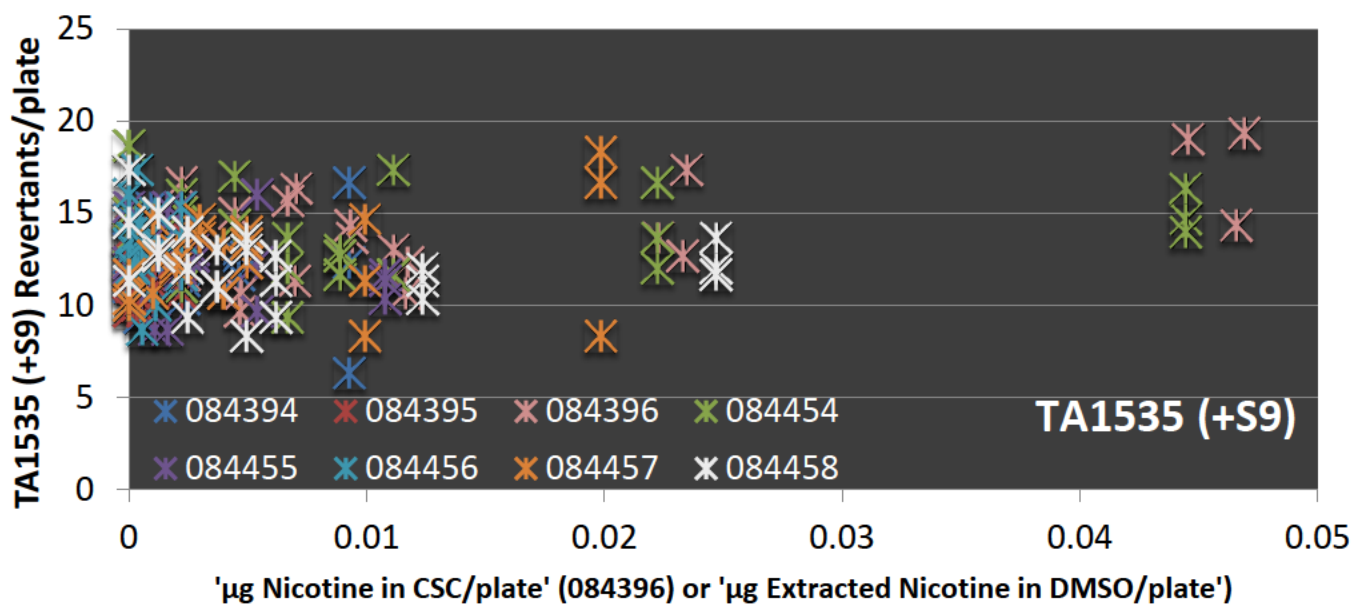
A significant difference between mean 'Nicotine' specific activity slope estimates was detected in TA100 (+S9) between **KR 2R4F** and each of **{084454 (Fresh Strips), 084456 (Copenhagen Long Cut)}**

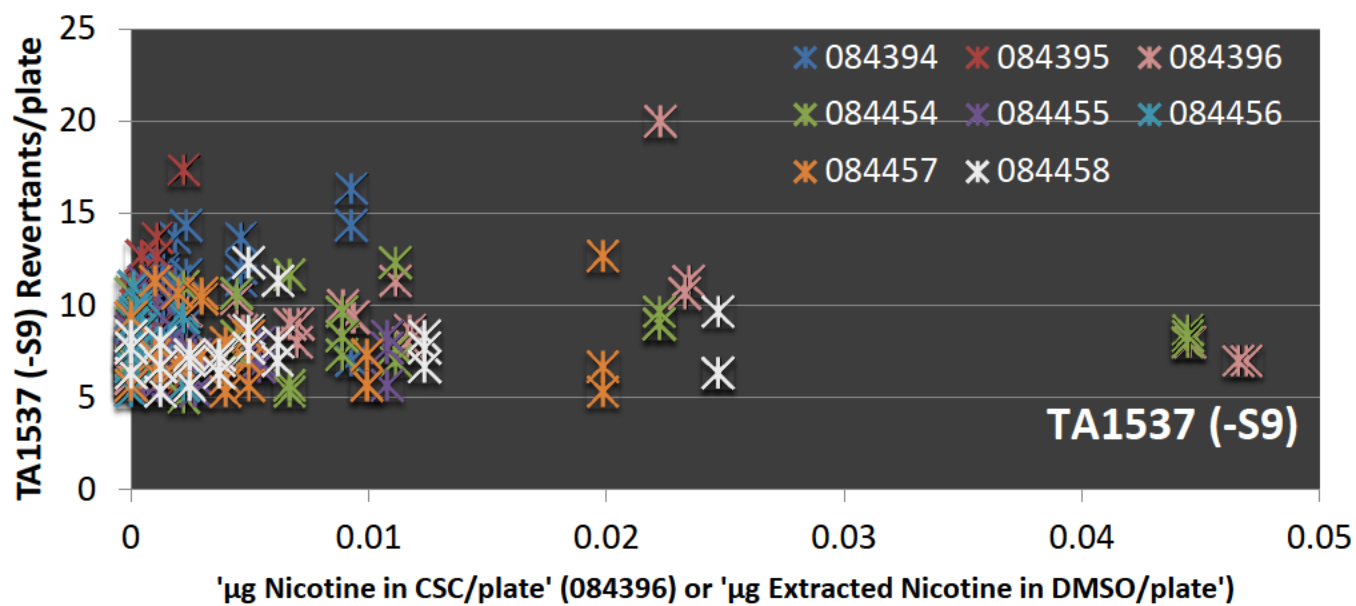
TA100 (-S9)

A significant difference between mean 'Nicotine' specific activity slope estimates was detected in TA100 (-S9) between **KR 2R4F** and **084395 (2S3)**









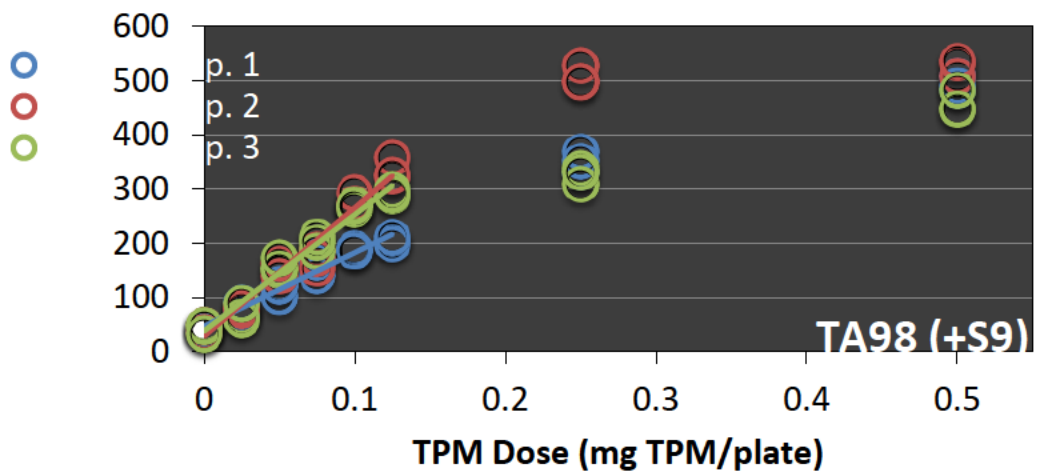
**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/mg TPM)**

Strain and S9 Activation	Sample ID	Sample Description	Number of Revertant Colonies/mg TPM										
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate TPM Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard			t-test p-value (H_0 : mean= 0)	
			(mg TPM/plate)	slope	(mg TPM/plate)	slope	(mg TPM/plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA98 (+S9)	084396	KR 2R4F	0 - 0.125	1359	0 - 0.125	2371	0 - 0.125	2149	1959	307	638 - 3281	0.024	significant
TA98 (-S9)	084396	KR 2R4F	0 - 0.500	62.2	0 - 0.500	98.3	0 - 0.500	50.5	70.3	14.4	8.51 - 132	0.039	significant
TA100 (+S9)	084396	KR 2R4F	0 - 0.250	616	0 - 0.250	748	0 - 0.250	866	743	72	432 - 1054	0.009	significant
TA100 (-S9)	084396	KR 2R4F	0 - 0.125	334	0 - 0.125	276	0 - 0.250	147	252	55	15.6 - 489	0.044	significant
TA102 (+S9)	084396	KR 2R4F	0 - 0.500	-18.6	0 - 0.500	77.3	0 - 0.500	118	59.1	40.6	0* - 234	0.283	not significant
TA102 (-S9)	084396	KR 2R4F	0 - 0.500	-54.9	0 - 0.125	195	0 - 0.500	36.4	59.0	73.1	0* - 374	0.505	not significant
TA1535 (+S9)	084396	KR 2R4F	0 - 0.500	14.0	0 - 0.500	5.75	0 - 0.500	8.25	9.32	2.43	0* - 19.8	0.062	not significant
TA1535 (-S9)	084396	KR 2R4F	0 - 0.500	1.29	0 - 0.500	9.08	0 - 0.500	1.97	4.12	2.49	0* - 14.8	0.240	not significant
TA1537 (+S9)	084396	KR 2R4F	0 - 0.250	299	0 - 0.125	315	0 - 0.125	339	318	12	267 - 369	0.001	significant
TA1537 (-S9)	084396	KR 2R4F	0 - 0.250	14.7	0 - 0.250	17.3	0 - 0.125	39.2	23.8	7.8	0* - 57.2	0.092	not significant

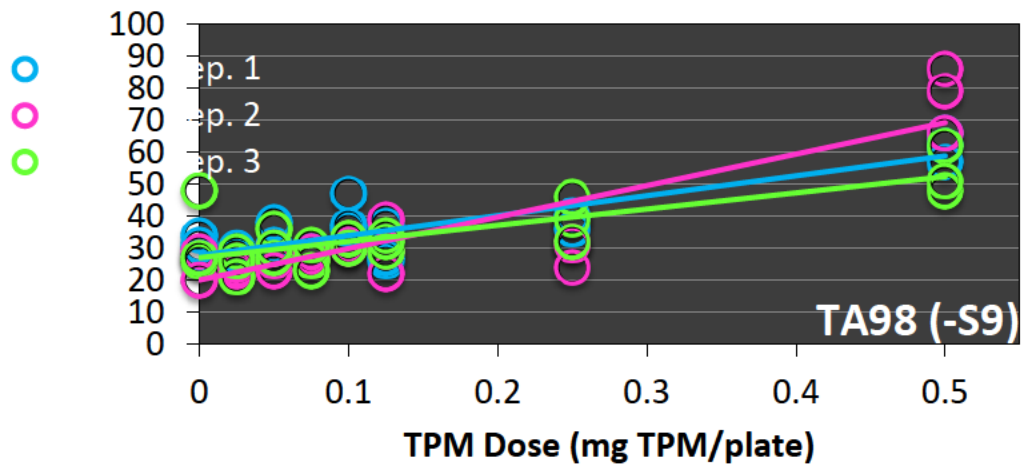
t-test analysis indicates mean specific activity TPM slope is greater than zero at $\alpha = 0.05$ for strains TA98 (+S9), TA98 (-S9), TA100 (+S9), TA100 (-S9) and TA1537 (+S9).

0*: Lower bound of the 95% confidence interval has been truncated at 0.

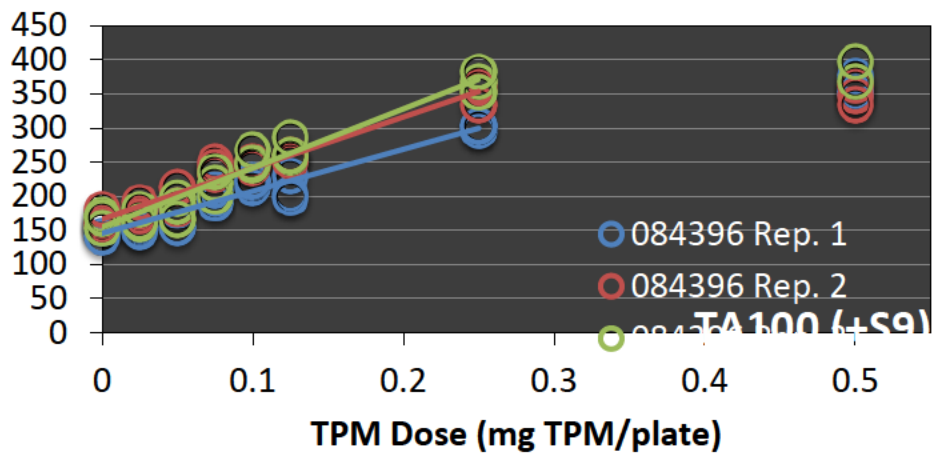
TA98 (+S9) Revertants/plate



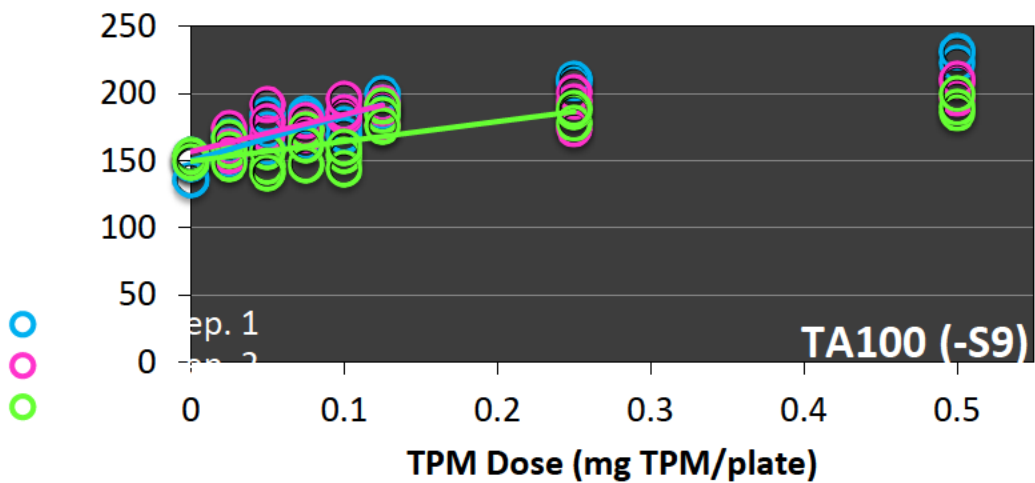
TA98 (-S9) Revertants/plate



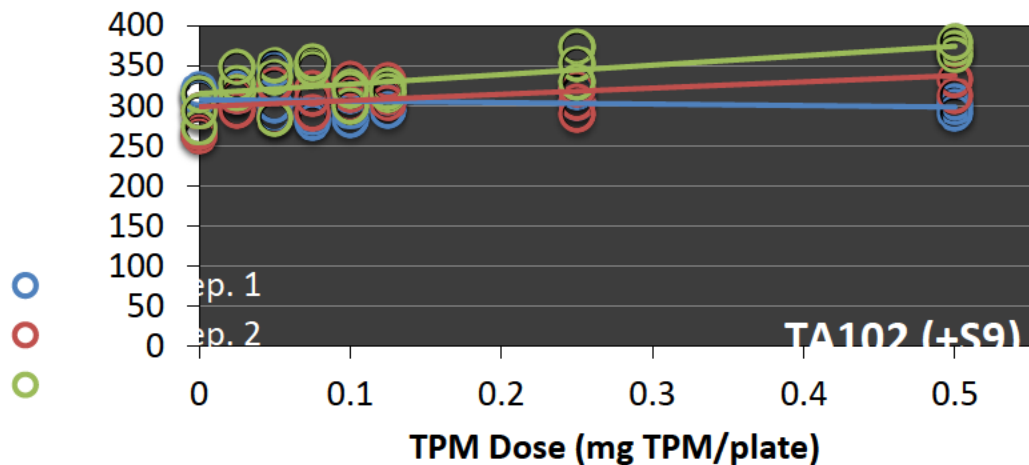
TA100 (+S9) Revertants/plate



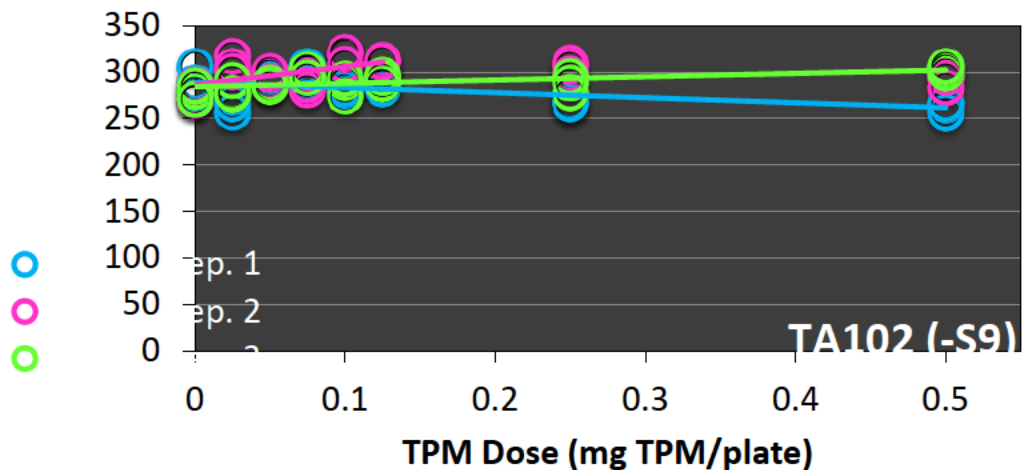
TA100 (-S9) Revertants/plate

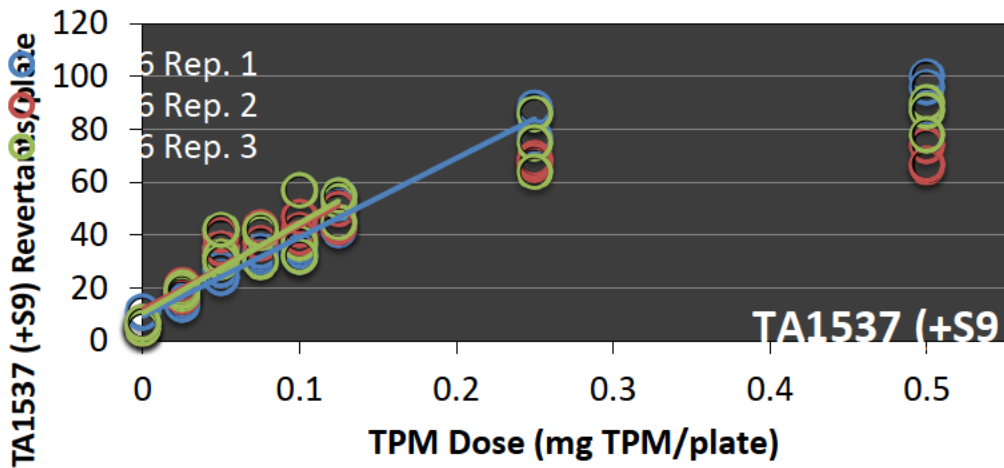
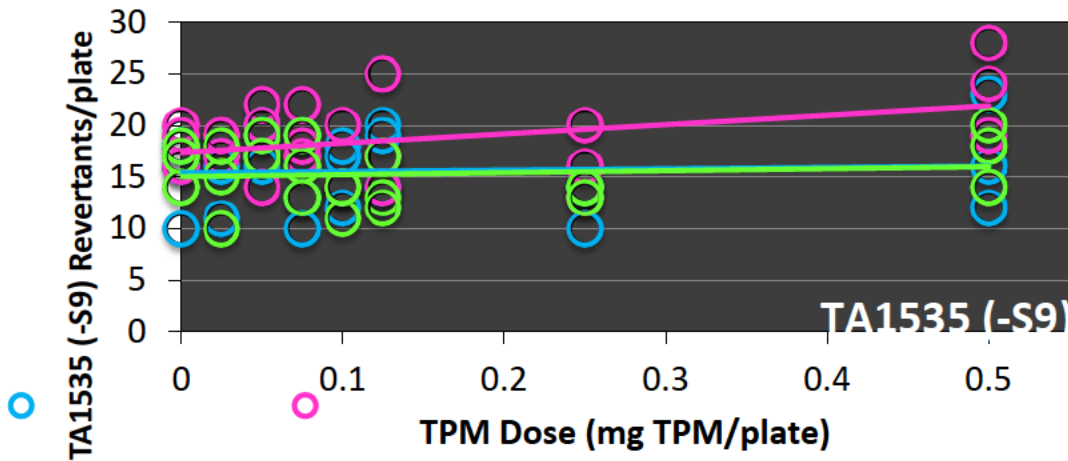
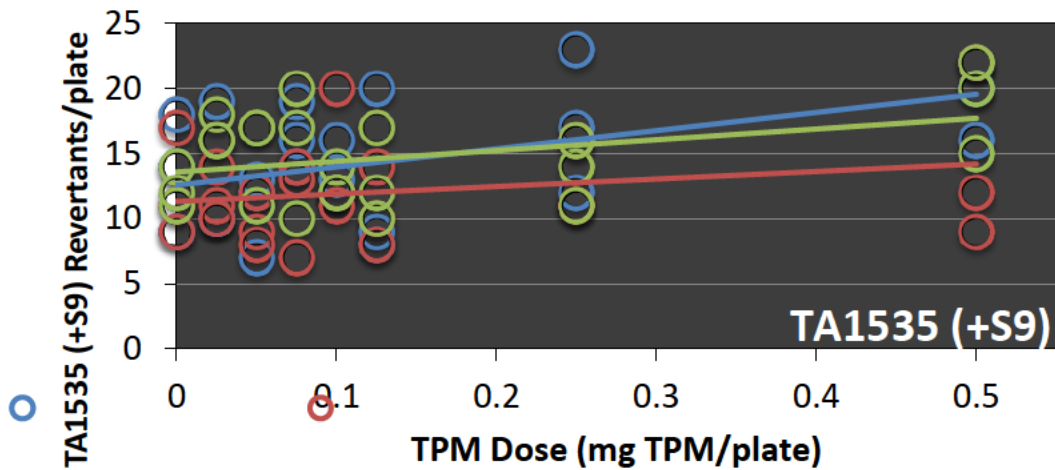


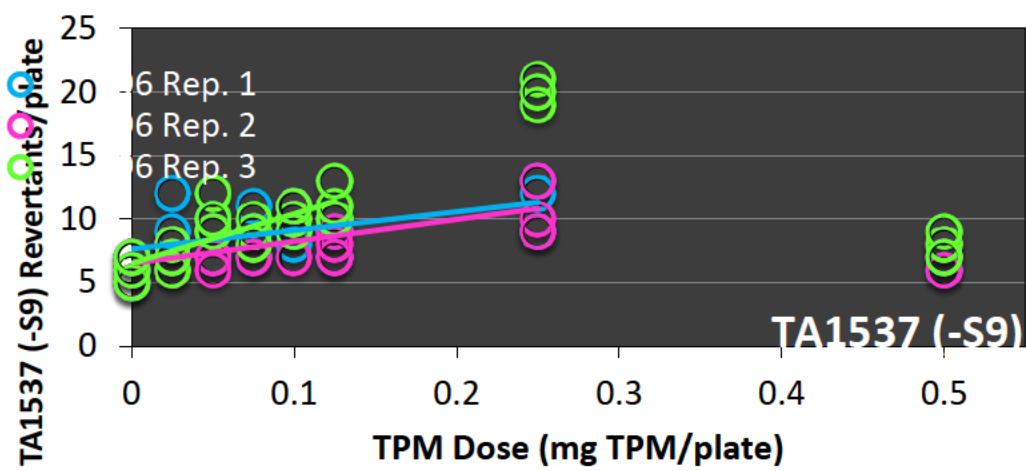
TA102 (+S9) Revertants/plate



TA102 (-S9) Revertants/plate







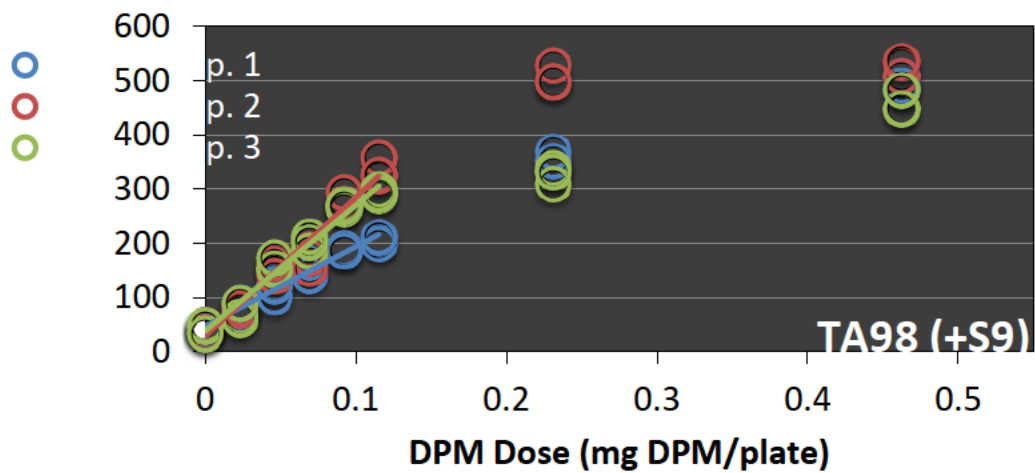
**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/mg Dry Particulate Matter (DPM))**

Strain and S9 Activation	Sample ID	Sample Description	Number of Revertant Colonies/mg DPM										
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate Slope Estimates				
			Dose Range (mg DPM/plate)		Dose Range (mg DPM/plate)		Dose Range (mg DPM/plate)		Standard		t-test p-value (H_0 : mean= 0)		
				slope		slope		slope	Mean	Error	95% C.I.	p-value	significance
TA98 (+S9)	084396	KR 2R4F	0 - 0.116	1469	0 - 0.116	2563	0 - 0.116	2323	2118	332	690 - 3547	0.024	significant
TA98 (-S9)	084396	KR 2R4F	0 - 0.463	67.2	0 - 0.463	106	0 - 0.463	54.6	76.0	15.5	9.2 - 143	0.039	significant
TA100 (+S9)	084396	KR 2R4F	0 - 0.231	665	0 - 0.231	809	0 - 0.231	936	803	78	467 - 1139	0.009	significant
TA100 (-S9)	084396	KR 2R4F	0 - 0.116	361	0 - 0.116	298	0 - 0.231	159	273	59	16.8 - 529	0.044	significant
TA102 (+S9)	084396	KR 2R4F	0 - 0.463	-20.1	0 - 0.463	83.5	0 - 0.463	128	63.8	43.9	0* - 253	0.283	not significant
TA102 (-S9)	084396	KR 2R4F	0 - 0.463	-59.3	0 - 0.116	211	0 - 0.463	39.3	63.8	79.1	0* - 404	0.505	not significant
TA1535 (+S9)	084396	KR 2R4F	0 - 0.463	15.1	0 - 0.463	6.21	0 - 0.463	8.92	10.07	2.62	0* - 21.4	0.062	not significant
TA1535 (-S9)	084396	KR 2R4F	0 - 0.463	1.4	0 - 0.463	9.82	0 - 0.463	2.13	4.45	2.69	0* - 16	0.240	not significant
TA1537 (+S9)	084396	KR 2R4F	0 - 0.231	323	0 - 0.116	341	0 - 0.116	367	344	13	289 - 398	0.001	significant
TA1537 (-S9)	084396	KR 2R4F	0 - 0.231	15.9	0 - 0.231	18.7	0 - 0.116	42.4	25.7	8.4	0* - 61.8	0.092	not significant

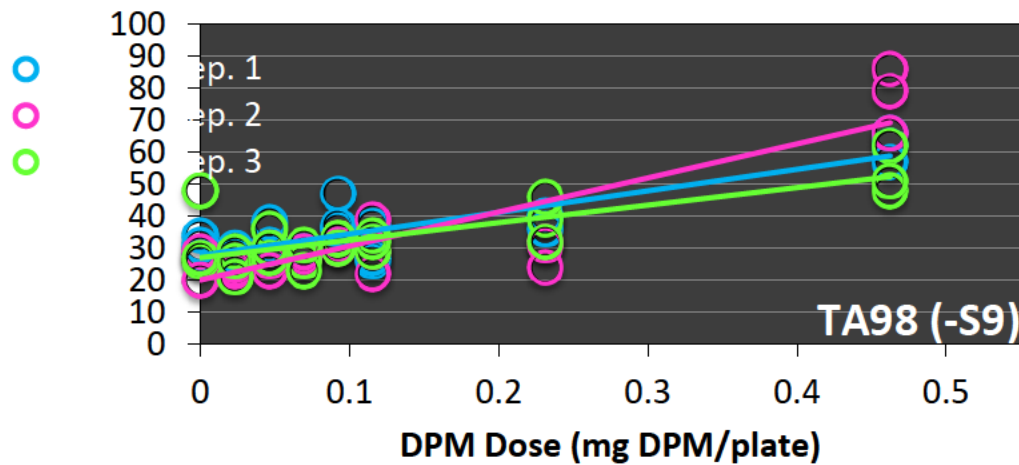
t-test analysis indicates mean specific activity DPM slope is greater than zero at $\alpha = 0.05$ for strains TA98 (+S9), TA98 (-S9), TA100 (+S9), TA100 (-S9) and TA1537 (+S9).

0*: Lower bound of the 95% confidence interval has been truncated at 0.

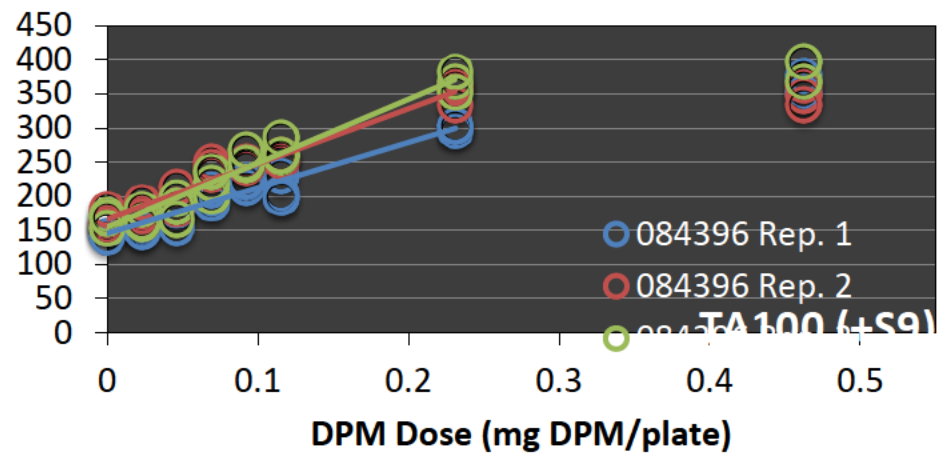
TA98 (+S9) Revertants/plate



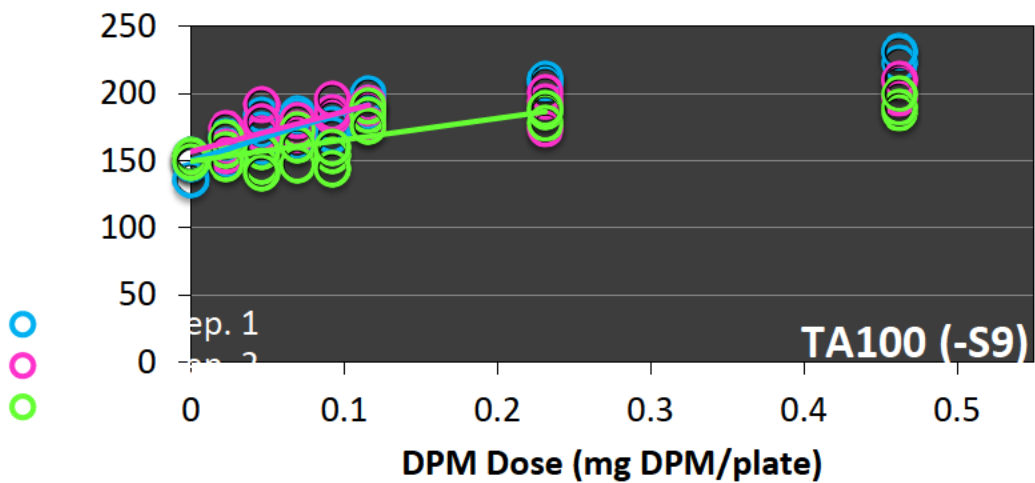
TA98 (-S9) Revertants/plate



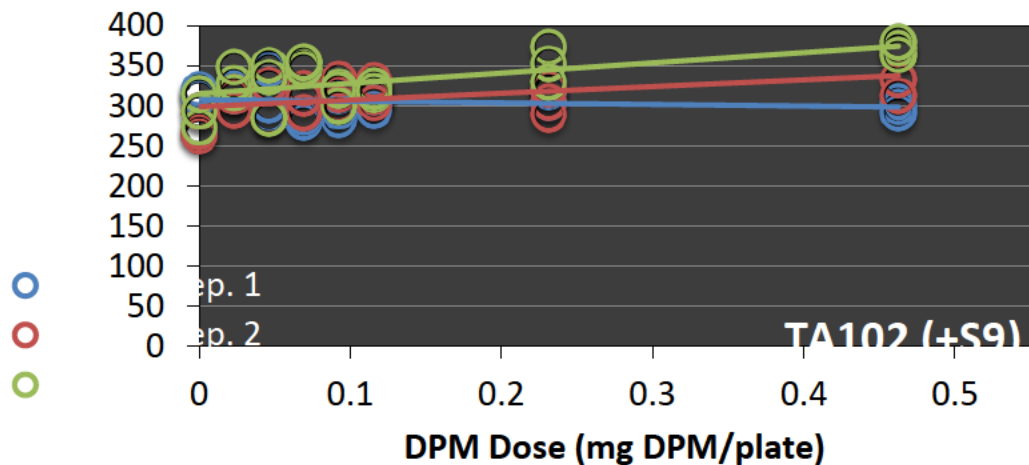
TA100 (+S9) Revertants/plate



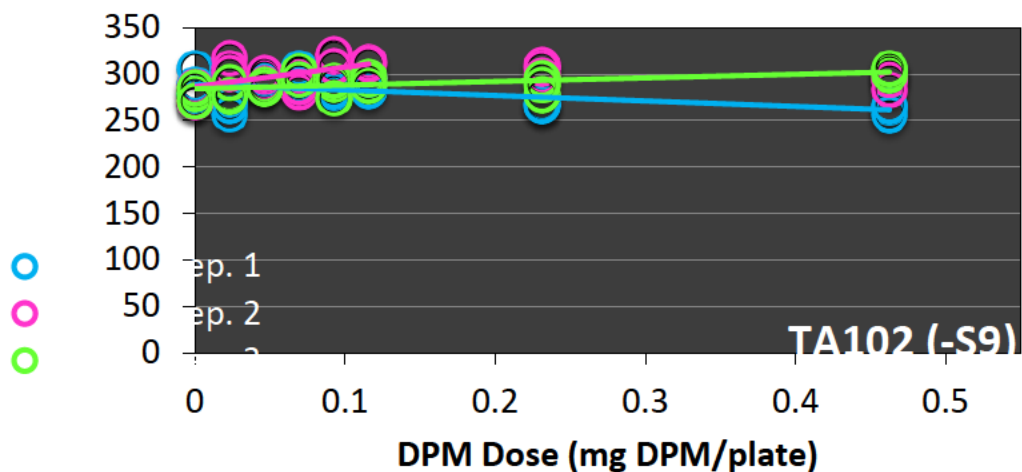
TA100 (-S9) Revertants/plate

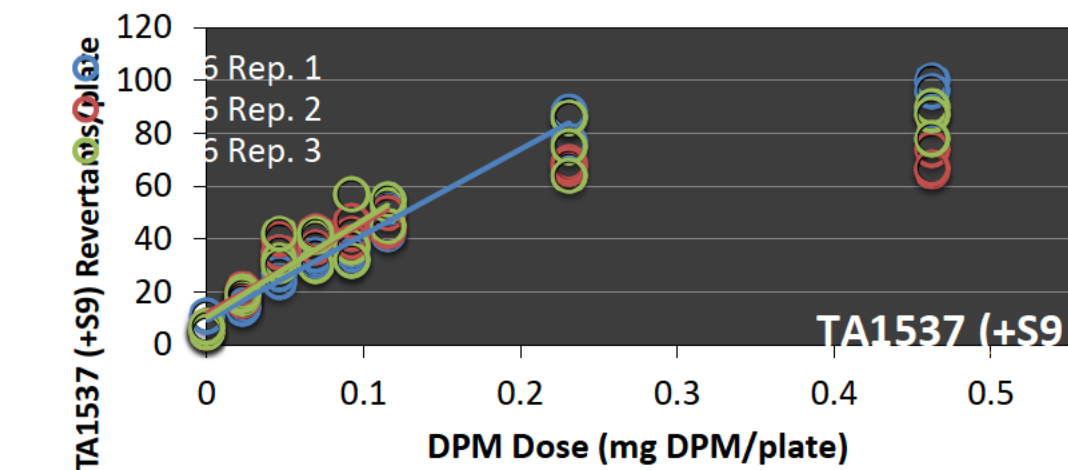
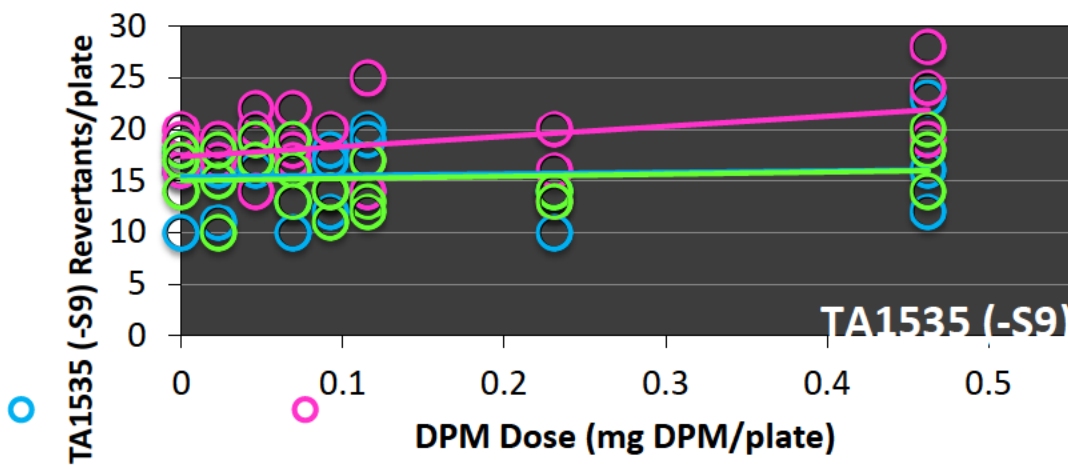
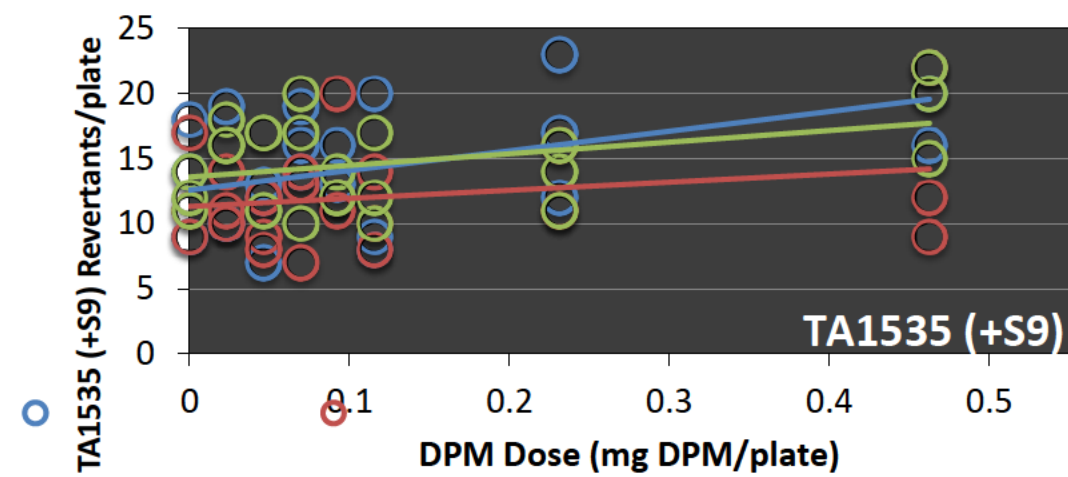


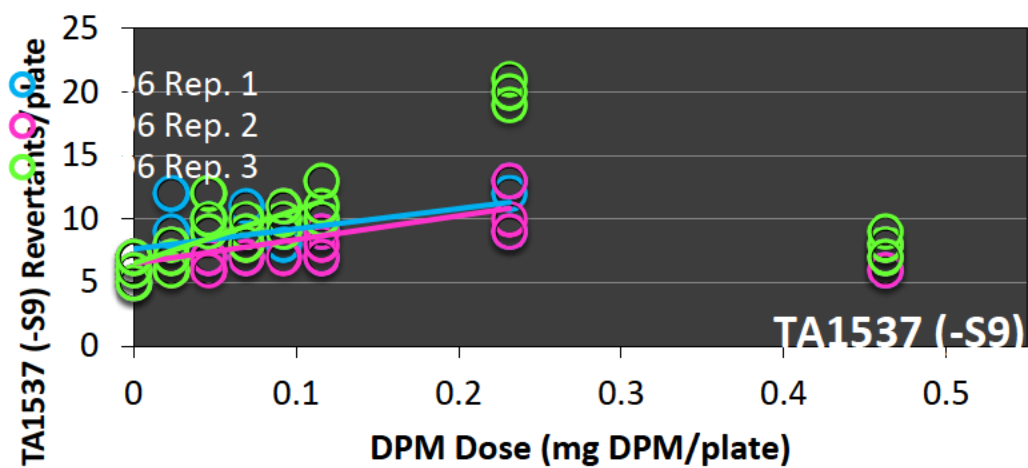
TA102 (+S9) Revertants/plate



TA102 (-S9) Revertants/plate







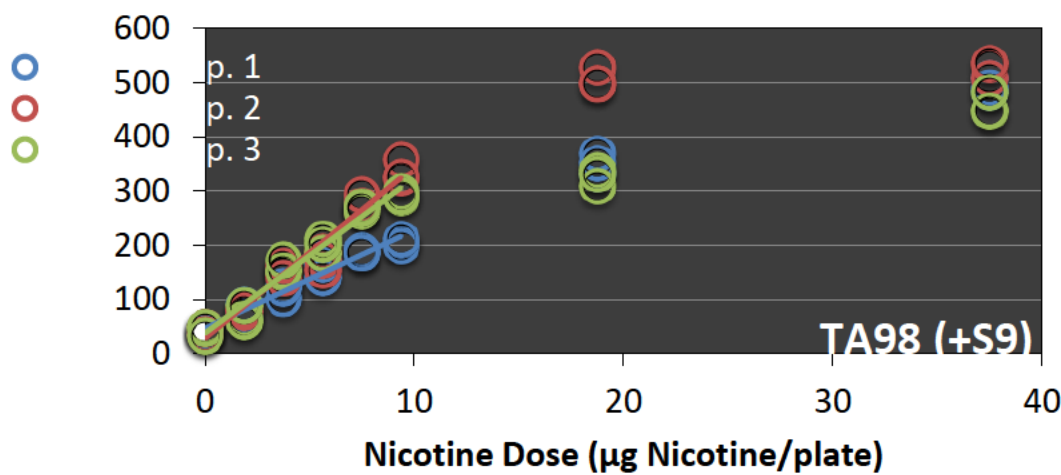
**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/ μ g Nicotine (Nic.))**

			Number of Revertant Colonies/μg Nicotine										
Strain and	Sample	Sample	Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard			t-test p-value (H ₀ : mean= 0)	
S9 Activation	ID	Description	(μg Nic./plate)	slope	(μg Nic./plate)	slope	(μg Nic./plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA98 (+S9)	084396	KR 2R4F	0 - 9.38	18.1	0 - 9.38	31.61	0 - 9.38	28.65	26.1	4.1	8.51 - 43.7	0.024	significant
TA98 (-S9)	084396	KR 2R4F	0 - 37.5	0.829	0 - 37.5	1.31	0 - 37.5	0.674	0.938	0.192	0.113 - 1.76	0.039	significant
TA100 (+S9)	084396	KR 2R4F	0 - 18.8	8.21	0 - 18.8	9.973	0 - 18.8	11.54	9.91	0.96	5.76 - 14.1	0.009	significant
TA100 (-S9)	084396	KR 2R4F	0 - 9.38	4.45	0 - 9.38	3.677	0 - 18.8	1.966	3.36	0.73	0.208 - 6.52	0.044	significant
TA102 (+S9)	084396	KR 2R4F	0 - 37.5	-0.248	0 - 37.5	1.03	0 - 37.5	1.58	0.787	0.541	0* - 3.12	0.283	not significant
TA102 (-S9)	084396	KR 2R4F	0 - 37.5	-0.731	0 - 9.38	2.606	0 - 37.5	0.485	0.786	0.975	0* - 4.98	0.505	not significant
TA1535 (+S9)	084396	KR 2R4F	0 - 37.5	0.186	0 - 37.5	0.077	0 - 37.5	0.110	0.124	0.032	0* - 0.263	0.062	not significant
TA1535 (-S9)	084396	KR 2R4F	0 - 37.5	0.017	0 - 37.5	0.121	0 - 37.5	0.026	0.055	0.033	0* - 0.198	0.240	not significant
TA1537 (+S9)	084396	KR 2R4F	0 - 18.8	3.98	0 - 9.38	4.206	0 - 9.38	4.526	4.24	0.16	3.56 - 4.91	0.001	significant
TA1537 (-S9)	084396	KR 2R4F	0 - 18.8	0.196	0 - 18.8	0.231	0 - 9.38	0.523	0.317	0.104	0* - 0.763	0.092	not significant

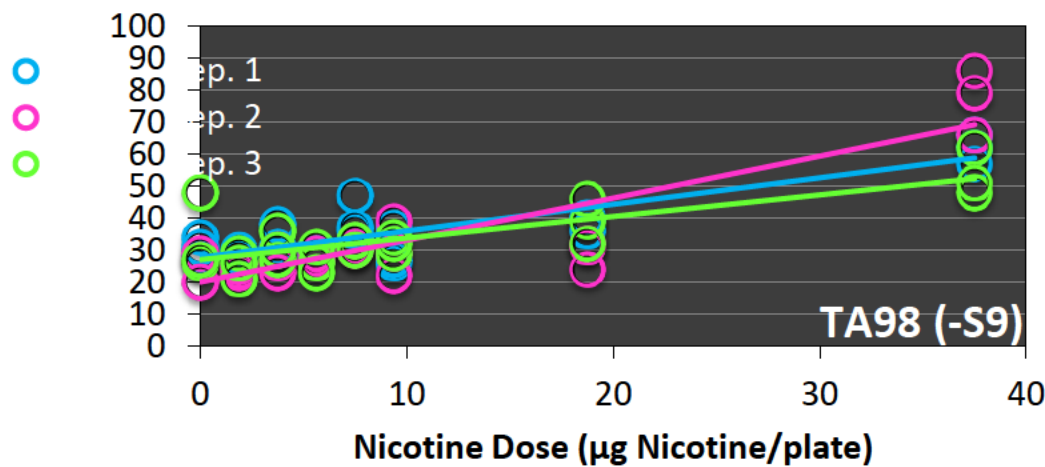
t-test analysis indicates mean specific activity Nicotine slope is greater than zero at $\alpha = 0.05$ for strains TA98 (+S9), TA98 (-S9), TA100 (+S9), TA100 (-S9) and TA1537 (+S9).

0*: Lower bound of the 95% confidence interval has been truncated at 0.

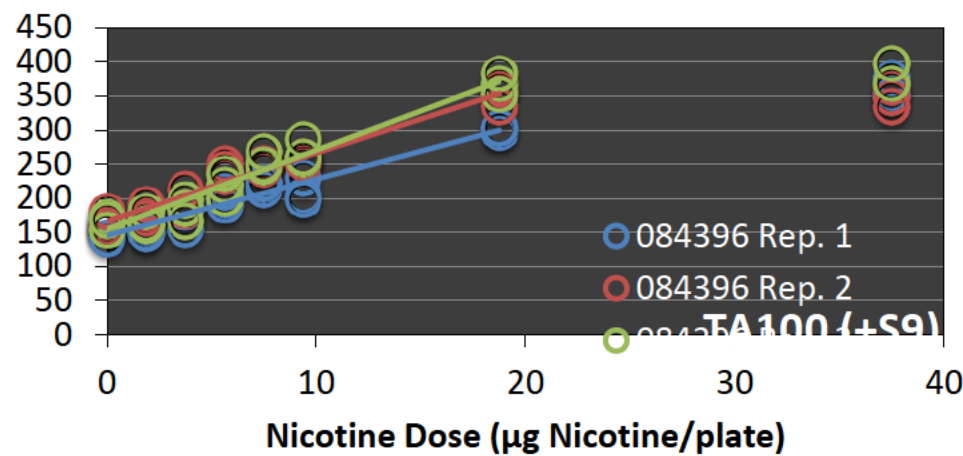
TA98 (+S9) Revertants/plate



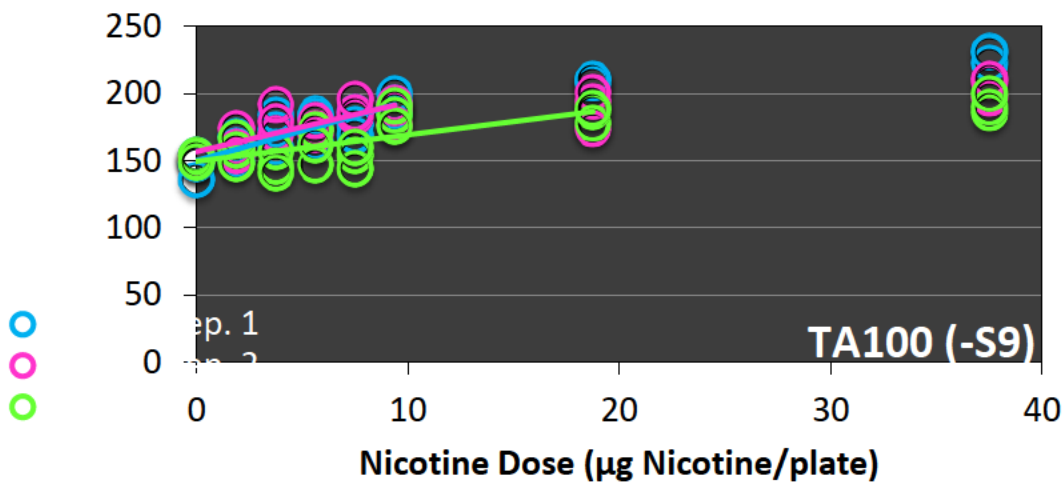
TA98 (-S9) Revertants/plate



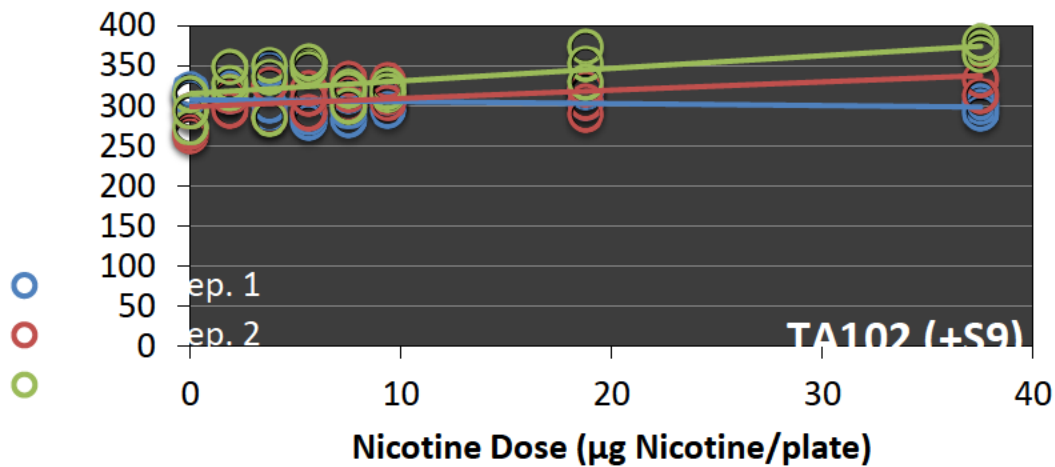
TA100 (+S9) Revertants/plate



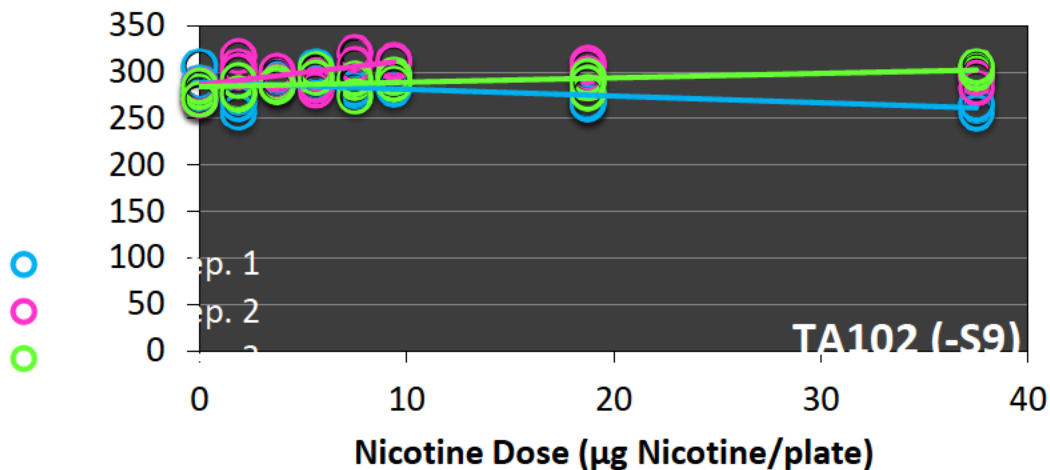
TA100 (-S9) Revertants/plate

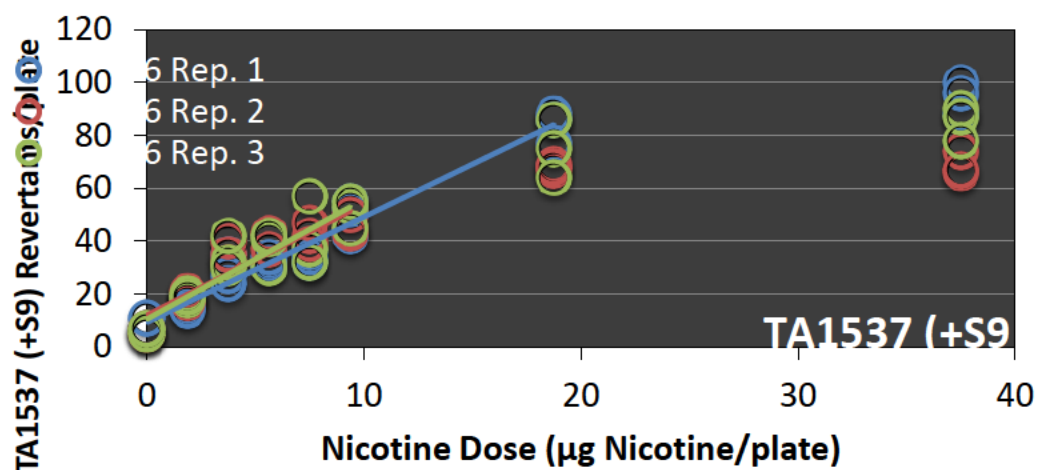
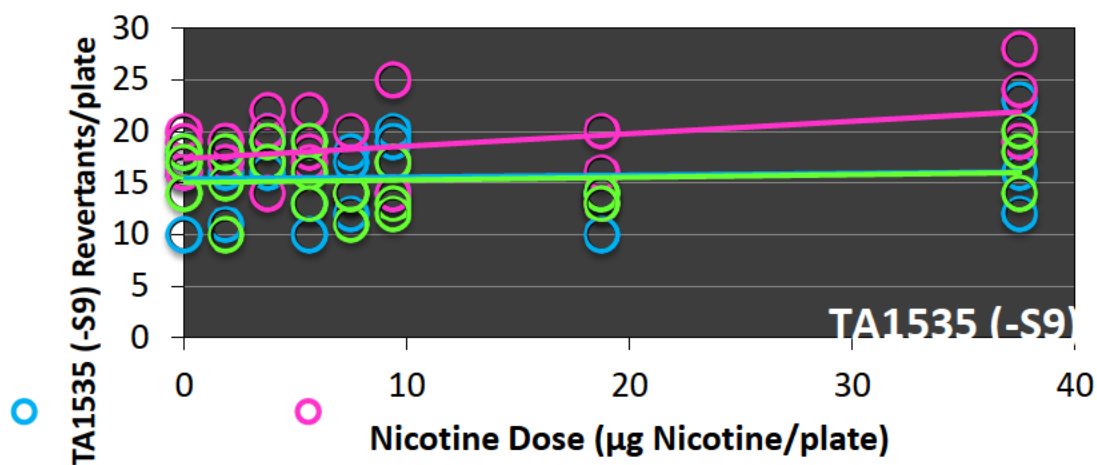
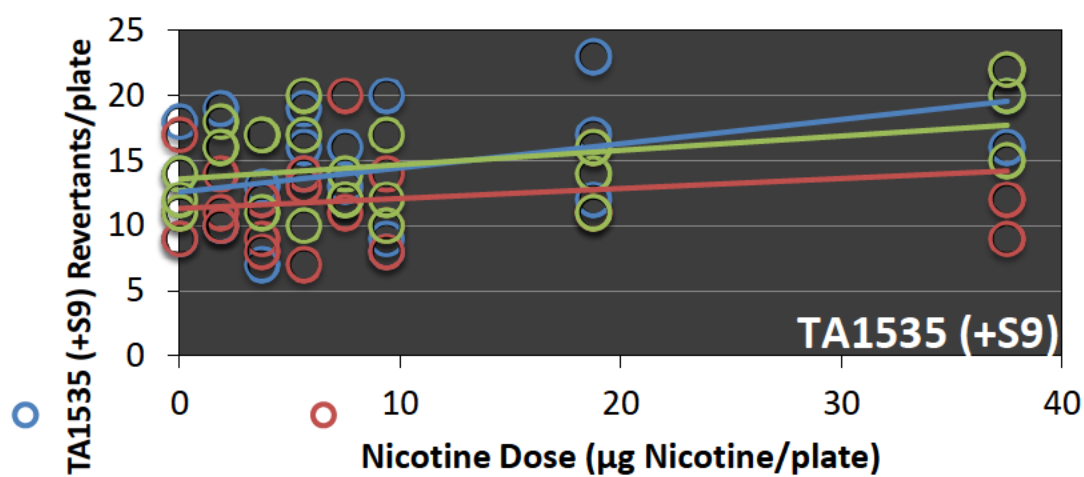


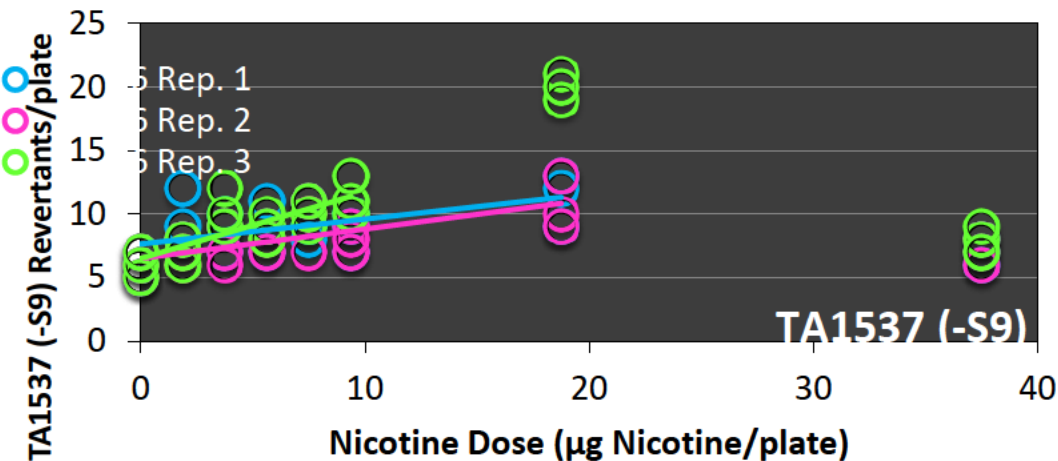
TA102 (+S9) Revertants/plate



TA102 (-S9) Revertants/plate







**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/ μ g 'Extracted Nicotine in DMSO' (Nic))**

Strain and S9 Activation	Sample ID	Sample Description	Number of Revertant Colonies/ μ g 'Extracted Nicotine in DMSO'										
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'Nic.' Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard		t-test p-value (H_0 : mean = 0)		
			(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA98 (+S9)	084394	Camel SNUS Frost	0 - 63.8	0.063	0 - 71.5	0.127	0 - 67.2	-0.120	0.023	0.074	0* - 0.342	0.782	not significant
TA98 (+S9)	084395	2S3	0 - 78	0.199	0 - 79.7	0.017	0 - 74.4	0.162	0.126	0.056	0* - 0.365	0.152	not significant
TA98 (+S9)	084454	Fresh Strips	0 - 20	-0.106	0 - 21.6	0.124	0 - 11.1	-0.621	0*	0.220	0* - 0.747	0.458	not significant
TA98 (+S9)	084455	Mellow Sticks	0 - 30.7	-0.189	0 - 29.1	0.002	0 - 30.9	0.193	0.002	0.110	0* - 0.477	0.987	not significant
TA98 (+S9)	084456	Copenhagen Long Cut	0 - 64.6	0.235	0 - 66.3	0.226	0 - 67.7	0.144	0.202	0.029	0.076 - 0.327	0.020	significant
TA98 (+S9)	084457	Ariva Wintergreen	0 - 29.5	0.061	0 - 30.8	-0.139	0 - 31.8	-0.177	0*	0.074	0* - 0.233	0.370	not significant
TA98 (+S9)	084458	Fresh Orbs	0 - 13.1	-0.014	0 - 14.4	-0.246	0 - 7.7	1.59	0.444	0.58	0* - 2.928	0.523	not significant
TA98 (-S9)	084394	Camel SNUS Frost	0 - 63.8	-0.024	0 - 71.5	0.085	0 - 33.6	0.000	0.020	0.033	0* - 0.162	0.601	not significant
TA98 (-S9)	084395	2S3	0 - 78	0.035	0 - 79.7	-0.040	0 - 37.2	-0.022	0*	0.023	0* - 0.088	0.731	not significant
TA98 (-S9)	084454	Fresh Strips	0 - 20	0.245	0 - 21.6	-0.021	0 - 22.1	0.230	0.151	0.086	0* - 0.522	0.221	not significant
TA98 (-S9)	084455	Mellow Sticks	0 - 30.7	0.270	0 - 29.1	0.212	0 - 30.9	0.196	0.226	0.023	0.129 - 0.323	0.010	significant
TA98 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	0.014	0 - 66.3	0.017	0 - 67.7	0.044	0.025	0.010	0* - 0.066	0.123	not significant
TA98 (-S9)	084457	Ariva Wintergreen	0 - 29.5	-0.067	0 - 15.4	0.240	0 - 31.8	0.110	0.094	0.089	0* - 0.477	0.401	not significant
TA98 (-S9)	084458	Fresh Orbs	0 - 13.1	-0.012	0 - 14.4	0.165	0 - 15.3	-0.011	0.047	0.059	0* - 0.301	0.505	not significant
TA100 (+S9)	084394	Camel SNUS Frost	0 - 16	0.116	0 - 17.9	1.05	0 - 16.8	1.53	0.898	0.41	0* - 2.681	0.163	not significant
TA100 (+S9)	084395	2S3	0 - 15.6	0.881	0 - 15.9	1.98	0 - 14.9	0.852	1.24	0.37	0* - 2.839	0.080	not significant
TA100 (+S9)	084454	Fresh Strips	0 - 5	5.25	0 - 10.8	2.77	0 - 5.5	3.31	3.78	0.75	0.542 - 7.015	0.037	significant
TA100 (+S9)	084455	Mellow Sticks	0 - 15.3	2.28	0 - 7.3	3.56	0 - 15.4	1.49	2.44	0.60	0* - 5.037	0.056	not significant
TA100 (+S9)	084456	Copenhagen Long Cut	0 - 32.3	1.17	0 - 16.6	2.14	0 - 16.9	1.57	1.63	0.28	0.415 - 2.841	0.029	significant
TA100 (+S9)	084457	Ariva Wintergreen	0 - 5.9	5.73	0 - 30.8	0.498	0 - 7.9	2.07	2.76	1.55	0* - 9.426	0.216	not significant
TA100 (+S9)	084458	Fresh Orbs	0 - 6.6	0.628	0 - 3.6	2.93	0 - 3.8	5.86	3.14	1.51	0* - 9.655	0.174	not significant
TA100 (-S9)	084394	Camel SNUS Frost	0 - 63.8	0.210	0 - 71.5	0.355	0 - 67.2	0.547	0.371	0.10	0* - 0.791	0.063	not significant
TA100 (-S9)	084395	2S3	0 - 39	0.290	0 - 79.7	0.299	0 - 74.4	0.413	0.334	0.039	0.164 - 0.504	0.014	significant
TA100 (-S9)	084454	Fresh Strips	0 - 20	-1.11	0 - 21.6	0.290	0 - 11.1	0.671	0*	0.54	0* - 2.282	0.935	not significant
TA100 (-S9)	084455	Mellow Sticks	0 - 15.3	1.92	0 - 29.1	-0.080	0 - 30.9	-1.26	0.194	0.93	0* - 4.178	0.854	not significant
TA100 (-S9)	084456	Copenhagen Long Cut	0 - 32.3	1.63	0 - 33.2	0.003	0 - 33.8	0.448	0.695	0.49	0* - 2.789	0.290	not significant
TA100 (-S9)	084457	Ariva Wintergreen	0 - 29.5	1.66	0 - 30.8	-2.19	0 - 31.8	-2.34	0*	1.31	0* - 4.68	0.542	not significant
TA100 (-S9)	084458	Fresh Orbs	0 - 13.1	-1.25	0 - 14.4	-3.54	0 - 15.3	-0.813	0*	0.84	0* - 1.767	0.158	not significant
TA102 (+S9)	084394	Camel SNUS Frost	0 - 12.8	3.64	0 - 17.9	4.44	0 - 16.8	3.44	3.84	0.31	2.525 - 5.155	0.006	significant
TA102 (+S9)	084395	2S3	0 - 15.6	3.35	0 - 79.7	0.305	0 - 18.6	1.23	1.63	0.9	0* - 5.508	0.213	not significant
TA102 (+S9)	084454	Fresh Strips	0 - 20	0.309	0 - 21.6	-0.865	0 - 22.1	0.168	0*	0.37	0* - 1.463	0.760	not significant
TA102 (+S9)	084455	Mellow Sticks	0 - 30.7	0.627	0 - 29.1	0.293	0 - 30.9	0.482	0.467	0.097	0.051 - 0.884	0.040	significant
TA102 (+S9)	084456	Copenhagen Long Cut	0 - 64.6	0.691	0 - 66.3	0.168	0 - 67.7	0.343	0.401	0.15	0* - 1.063	0.121	not significant
TA102 (+S9)	084457	Ariva Wintergreen	0 - 29.5	-0.423	0 - 30.8	-0.151	0 - 31.8	-0.296	0*	0.079	0* - 0.049	0.067	not significant
TA102 (+S9)	084458	Fresh Orbs	0 - 13.1	-5.05	0 - 14.4	0.518	0 - 15.3	-3.03	0*	1.63	0* - 4.48	0.261	not significant
TA102 (-S9)	084394	Camel SNUS Frost	0 - 63.8	-0.212	0 - 35.7	0.427	0 - 67.2	-0.117	0.033	0.20	0* - 0.89	0.885	not significant
TA102 (-S9)	084395	2S3	0 - 78	0.127	0 - 79.7	0.376	0 - 74.4	0.923	0.475	0.23	0* - 1.486	0.180	not significant

**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/ μ g 'Extracted Nicotine in DMSO' (Nic))**

Strain and S9 Activation	Sample ID	Sample Description	Number of Revertant Colonies/ μ g 'Extracted Nicotine in DMSO'										
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'Nic.' Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard		t-test p-value (H_0 : mean = 0)		
			(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	(μ g Nic./plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA102 (-S9)	084454	Fresh Strips	0 - 20	-0.223	0 - 21.6	1.50	0 - 5.5	11.9	4.39	3.8	0* - 20.664	0.366	not significant
TA102 (-S9)	084455	Mellow Sticks	0 - 15.3	0.687	0 - 29.1	0.595	0 - 30.9	0.041	0.441	0.20	0* - 1.309	0.161	not significant
TA102 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	-0.002	0 - 66.3	0.408	0 - 33.8	2.59	0.998	0.80	0* - 4.455	0.340	not significant
TA102 (-S9)	084457	Ariva Wintergreen	0 - 29.5	-0.871	0 - 30.8	-1.40	0 - 31.8	-0.152	0*	0.36	0* - 0.748	0.155	not significant
TA102 (-S9)	084458	Fresh Orbs	0 - 13.1	-7.72	0 - 14.4	0.930	0 - 15.3	1.10	0*	2.91	0* - 10.637	0.581	not significant
TA1535 (+S9)	084394	Camel SNUS Frost	0 - 63.8	0.007	0 - 71.5	0.041	0 - 67.2	-0.086	0*	0.038	0* - 0.15	0.770	not significant
TA1535 (+S9)	084395	2S3	0 - 78	0.026	0 - 79.7	0.010	0 - 74.4	-0.004	0.011	0.009	0* - 0.049	0.335	not significant
TA1535 (+S9)	084454	Fresh Strips	0 - 20	0.101	0 - 21.6	0.086	0 - 22.1	-0.091	0.032	0.062	0* - 0.297	0.656	not significant
TA1535 (+S9)	084455	Mellow Sticks	0 - 30.7	-0.012	0 - 29.1	-0.152	0 - 15.4	0.271	0.036	0.124	0* - 0.57	0.801	not significant
TA1535 (+S9)	084456	Copenhagen Long Cut	0 - 64.6	0.015	0 - 66.3	0.018	0 - 67.7	-0.019	0.005	0.012	0* - 0.056	0.738	not significant
TA1535 (+S9)	084457	Ariva Wintergreen	0 - 29.5	0.230	0 - 30.8	0.143	0 - 31.8	-0.164	0.069	0.119	0* - 0.583	0.619	not significant
TA1535 (+S9)	084458	Fresh Orbs	0 - 13.1	0.103	0 - 14.4	0.012	0 - 15.3	-0.262	0*	0.110	0* - 0.424	0.699	not significant
TA1535 (-S9)	084394	Camel SNUS Frost	0 - 63.8	0.006	0 - 71.5	0.074	0 - 67.2	-0.046	0.011	0.035	0* - 0.162	0.776	not significant
TA1535 (-S9)	084395	2S3	0 - 78	-0.019	0 - 79.7	0.020	0 - 74.4	0.070	0.024	0.026	0* - 0.134	0.455	not significant
TA1535 (-S9)	084454	Fresh Strips	0 - 10	0.186	0 - 10.8	0.422	0 - 11.1	0.275	0.295	0.069	0* - 0.59	0.050	not significant
TA1535 (-S9)	084455	Mellow Sticks	0 - 30.7	-0.144	0 - 29.1	0.013	0 - 30.9	-0.011	0*	0.049	0* - 0.162	0.432	not significant
TA1535 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	0.034	0 - 66.3	0.077	0 - 33.8	0.146	0.086	0.033	0* - 0.226	0.120	not significant
TA1535 (-S9)	084457	Ariva Wintergreen	0 - 7.4	0.769	0 - 30.8	0.141	0 - 31.8	-0.054	0.285	0.25	0* - 1.355	0.370	not significant
TA1535 (-S9)	084458	Fresh Orbs	0 - 3.3	1.74	0 - 7.2	0.842	0 - 15.3	0.067	0.884	0.48	0* - 2.965	0.209	not significant
TA1537 (+S9)	084394	Camel SNUS Frost	0 - 31.9	0.254	0 - 71.5	0.098	0 - 67.2	0.109	0.154	0.050	0* - 0.37	0.093	not significant
TA1537 (+S9)	084395	2S3	0 - 19.5	0.557	0 - 79.7	0.074	0 - 74.4	0.073	0.235	0.16	0* - 0.928	0.282	not significant
TA1537 (+S9)	084454	Fresh Strips	0 - 20	0.052	0 - 21.6	-0.020	0 - 22.1	-0.077	0*	0.037	0* - 0.146	0.727	not significant
TA1537 (+S9)	084455	Mellow Sticks	0 - 30.7	-0.066	0 - 29.1	0.045	0 - 30.9	0.101	0.027	0.049	0* - 0.239	0.641	not significant
TA1537 (+S9)	084456	Copenhagen Long Cut	0 - 32.3	0.208	0 - 33.2	0.155	0 - 67.7	0.084	0.149	0.036	0* - 0.304	0.054	not significant
TA1537 (+S9)	084457	Ariva Wintergreen	0 - 29.5	-0.068	0 - 30.8	0.105	0 - 31.8	-0.039	0*	0.054	0* - 0.23	0.992	not significant
TA1537 (+S9)	084458	Fresh Orbs	0 - 13.1	0.583	0 - 14.4	-0.073	0 - 15.3	0.022	0.177	0.205	0* - 1.058	0.478	not significant
TA1537 (-S9)	084394	Camel SNUS Frost	0 - 16	0.361	0 - 71.5	0.068	0 - 33.6	0.182	0.204	0.085	0* - 0.571	0.140	not significant
TA1537 (-S9)	084395	2S3	0 - 78	0.133	0 - 39.9	0.132	0 - 37.2	0.045	0.103	0.029	0* - 0.228	0.070	not significant
TA1537 (-S9)	084454	Fresh Strips	0 - 20	-0.024	0 - 21.6	0.069	0 - 22.1	0.028	0.024	0.027	0* - 0.14	0.458	not significant
TA1537 (-S9)	084455	Mellow Sticks	0 - 30.7	0.013	0 - 29.1	-0.053	0 - 30.9	-0.044	0*	0.020	0* - 0.06	0.304	not significant
TA1537 (-S9)	084456	Copenhagen Long Cut	0 - 64.6	0.011	0 - 66.3	-0.031	0 - 67.7	0.032	0.004	0.018	0* - 0.083	0.854	not significant
TA1537 (-S9)	084457	Ariva Wintergreen	0 - 29.5	0.006	0 - 30.8	-0.085	0 - 31.8	0.063	0*	0.043	0* - 0.181	0.914	not significant
TA1537 (-S9)	084458	Fresh Orbs	0 - 6.6	0.452	0 - 14.4	0.112	0 - 15.3	-0.093	0.157	0.159	0* - 0.84	0.426	not significant

0*: Mean or lower bound of the 95% confidence interval has been truncated at 0.

**One-Way ANOVA of Mean 'Extracted Nicotine'
Slope Estimates Among Test Samples**

TA98 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.792327199	6	0.132054533	0.753	0.617
Within Samples	2.453979328	14	0.175284238		
Total (Corr.)	3.246306527	20			

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	19.99759742	6	3.332932903	1.294	0.322
Within Samples	36.05876745	14	2.575626247		
Total (Corr.)	56.05636487	20			

TA102 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	67.74594643	6	11.29099107	7.063	0.001
Within Samples	22.37982339	14	1.598558814		
Total (Corr.)	90.12576982	20			

TA1535 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.025947952	6	0.004324659	0.214	0.966
Within Samples	0.283019515	14	0.02021568		
Total (Corr.)	0.308967467	20			

TA1537 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.173991565	6	0.028998594	0.863	0.544
Within Samples	0.470180994	14	0.033584357		
Total (Corr.)	0.64417256	20			

**One-Way ANOVA of Mean 'Extracted Nicotine'
Slope Estimates Among Test Samples**

TA98 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.126526575	6	0.021087762	2.344	0.089
Within Samples	0.125944491	14	0.008996035		
Total (Corr.)	0.252471066	20			

TA100 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	14.80174676	6	2.466957793	1.504	0.247
Within Samples	22.96043495	14	1.640031068		
Total (Corr.)	37.76218171	20			

TA102 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	69.15694637	6	11.52615773	1.134	0.393
Within Samples	142.2476686	14	10.16054776		
Total (Corr.)	211.404615	20			

TA1535 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	1.865520022	6	0.310920004	2.372	0.086
Within Samples	1.834813937	14	0.131058138		
Total (Corr.)	3.700333959	20			

TA1537 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.144493408	6	0.024082235	1.534	0.238
Within Samples	0.219854302	14	0.015703879		
Total (Corr.)	0.36434771	20			

One-way ANOVA analysis indicates significant differences (at $\alpha = 0.05$) among mean 'Extracted Nicotine' specific activity slope estimates for test samples with TA102 (+S9).

**Evaluation of Ratio (Max ÷ Min) of Standard Deviations of
'Nicotine in Smokeless Tobacco' Slope Estimates and
Corresponding Method of Comparison**

Strain and S9 Activation	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	19.8	Pairwise T-test (unequal variance)
TA98 (-S9)	9.3	ANOVA (equal variance)
TA100 (+S9)	5.5	ANOVA (equal variance)
TA100 (-S9)	33.2	Pairwise T-test (unequal variance)
TA102 (+S9)	20.7	Pairwise T-test (unequal variance)
TA102 (-S9)	19.0	Pairwise T-test (unequal variance)
TA1535 (+S9)	14.2	ANOVA (equal variance)
TA1535 (-S9)	18.8	Pairwise T-test (unequal variance)
TA1537 (+S9)	5.7	ANOVA (equal variance)
TA1537 (-S9)	8.6	ANOVA (equal variance)

**Evaluation of Ratio (Max ÷ Min) of Standard Deviations of
'Nicotine in Smokeless Tobacco' Slope Estimates and
Corresponding Method of Comparison**

**ANOVA-Based Comparison Tests of Mean 'Extracted Nicotine' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

ANOVA-Based Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	0.0900	0.7686	not significant	0.07	0.7991	not significant	4.5884	0.0503	not significant	0.0416	0.8413	not significant	0.2934	0.5966	not significant
084394 vs. 084454	0.4302	0.5225	not significant	4.8325	0.0452	not significant	14.784	0.0018	significant	0.1477	0.7065	not significant	1.2707	0.2786	not significant
084394 vs. 084455	0.0039	0.9510	not significant	1.3929	0.2576	not significant	10.673	0.0056	not significant	0.1741	0.6828	not significant	0.7191	0.4107	not significant
084394 vs. 084456	0.27	0.6100	not significant	0.31	0.5865	not significant	11.100	0.0049	not significant	0.0221	0.8839	not significant	0.0010	0.9758	not significant
084394 vs. 084457	0.1004	0.7560	not significant	2.0257	0.1766	not significant	16.005	0.0013	significant	0.5010	0.4907	not significant	1.0633	0.3199	not significant
084394 vs. 084458	1.5108	0.2393	not significant	2.9261	0.1092	not significant	37.961	0.0000	significant	0.0980	0.7588	not significant	0.0245	0.8778	not significant
084395 vs. 084454	0.91	0.3554	not significant	3.76	0.0729	not significant	2.9002	0.1107	not significant	0.0325	0.8594	not significant	2.7853	0.1173	not significant
084395 vs. 084455	0.1314	0.7224	not significant	0.85	0.3727	not significant	1.2655	0.2795	not significant	0.0455	0.8341	not significant	1.9312	0.1863	not significant
084395 vs. 084456	0.0492	0.8277	not significant	0.0884	0.7706	not significant	1.4151	0.2540	not significant	0.0031	0.9567	not significant	0.3278	0.5760	not significant
084395 vs. 084457	0.38	0.5472	not significant	1.35	0.2639	not significant	3.4542	0.0842	not significant	0.2539	0.6222	not significant	2.4739	0.1381	not significant
084395 vs. 084458	0.8634	0.3685	not significant	2.11	0.1688	not significant	16.154	0.0013	significant	0.2673	0.6132	not significant	0.1483	0.7059	not significant
084454 vs. 084455	0.3521	0.5624	not significant	1.0365	0.3259	not significant	0.3341	0.5724	not significant	0.0011	0.9742	not significant	0.0780	0.7841	not significant
084454 vs. 084456	1.39	0.2586	not significant	2.69	0.1229	not significant	0.2636	0.6157	not significant	0.0555	0.8171	not significant	1.2020	0.2914	not significant
084454 vs. 084457	0.1149	0.7396	not significant	0.6006	0.4512	not significant	0.0242	0.8786	not significant	0.1047	0.7511	not significant	0.0092	0.9248	not significant
084454 vs. 084458	3.5533	0.0804	not significant	0.2378	0.6333	not significant	5.3646	0.0362	not significant	0.4863	0.4970	not significant	1.6481	0.2201	not significant
084455 vs. 084456	0.34	0.5684	not significant	0.39	0.5430	not significant	0.0042	0.9494	not significant	0.0722	0.7921	not significant	0.6676	0.4276	not significant
084455 vs. 084457	0.0647	0.8029	not significant	0.0591	0.8115	not significant	0.5382	0.4753	not significant	0.0844	0.7757	not significant	0.0336	0.8573	not significant
084455 vs. 084458	1.6683	0.2174	not significant	0.2813	0.6041	not significant	8.3764	0.0118	not significant	0.5334	0.4772	not significant	1.0091	0.3322	not significant
084456 vs. 084457	0.70	0.4158	not significant	0.75	0.4008	not significant	0.4475	0.5144	not significant	0.3126	0.5849	not significant	1.0005	0.3342	not significant
084456 vs. 084458	0.50	0.4909	not significant	1.33	0.2679	not significant	8.0065	0.0134	not significant	0.2132	0.6514	not significant	0.0351	0.8540	not significant
084457 vs. 084458	2.3902	0.1444	not significant	0.0825	0.7781	not significant	4.6682	0.0485	not significant	1.0422	0.3246	not significant	1.4107	0.2547	not significant

**ANOVA-Based Comparison Tests of Mean 'Extracted Nicotine' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

ANOVA-Based Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	0.1421	0.7118	not significant	0.0012	0.9726	not significant	0.0289	0.8673	not significant	0.0017	0.9674	not significant	0.9621	0.3433	not significant
084394 vs. 084454	2.8627	0.1128	not significant	0.1616	0.6937	not significant	2.8009	0.1164	not significant	0.9178	0.3543	not significant	3.070	0.1016	not significant
084394 vs. 084455	7.0529	0.0188	not significant	0.0285	0.8683	not significant	0.0246	0.8776	not significant	0.0396	0.8451	not significant	5.129	0.0399	not significant
084394 vs. 084456	0.0033	0.9550	not significant	0.0962	0.7610	not significant	0.1376	0.7163	not significant	0.0630	0.8054	not significant	3.815	0.0711	not significant
084394 vs. 084457	0.9109	0.3561	not significant	1.6042	0.2260	not significant	0.1044	0.7514	not significant	0.8582	0.3699	not significant	4.170	0.0604	not significant
084394 vs. 084458	0.1223	0.7318	not significant	4.5788	0.0505	not significant	0.5506	0.4703	not significant	8.7072	0.0105	not significant	0.207	0.6558	not significant
084395 vs. 084454	4.2806	0.0575	not significant	0.1348	0.7190	not significant	2.2604	0.1549	not significant	0.8398	0.3750	not significant	0.59	0.4534	not significant
084395 vs. 084455	9.1976	0.0090	not significant	0.0180	0.8953	not significant	0.0002	0.9896	not significant	0.0579	0.8133	not significant	1.65	0.2200	not significant
084395 vs. 084456	0.1888	0.6705	not significant	0.1191	0.7352	not significant	0.0403	0.8438	not significant	0.0439	0.8371	not significant	0.95	0.3474	not significant
084395 vs. 084457	1.7727	0.2043	not significant	1.5170	0.2384	not significant	0.2432	0.6295	not significant	0.7829	0.3912	not significant	1.13	0.3065	not significant
084395 vs. 084458	0.5282	0.4794	not significant	4.4306	0.0538	not significant	0.8321	0.3771	not significant	8.4633	0.0114	not significant	0.28	0.6075	not significant
084454 vs. 084455	0.9289	0.3515	not significant	0.0543	0.8190	not significant	2.3007	0.1516	not significant	1.3389	0.2666	not significant	0.2629	0.6161	not significant
084454 vs. 084456	2.6715	0.1244	not significant	0.5072	0.4880	not significant	1.6971	0.2137	not significant	0.4998	0.4912	not significant	0.0404	0.8435	not significant
084454 vs. 084457	0.5440	0.4730	not significant	0.7474	0.4019	not significant	3.9866	0.0657	not significant	0.0010	0.9752	not significant	0.0842	0.7760	not significant
084454 vs. 084458	1.8016	0.2009	not significant	3.0198	0.1042	not significant	5.8353	0.0300	not significant	3.9712	0.0662	not significant	1.6814	0.2157	not significant
084455 vs. 084456	6.7509	0.0210	not significant	0.2295	0.6393	not significant	0.0458	0.8336	not significant	0.2026	0.6595	not significant	0.0971	0.7599	not significant
084455 vs. 084457	2.8945	0.1110	not significant	1.2048	0.2909	not significant	0.2303	0.6387	not significant	1.2667	0.2793	not significant	0.0496	0.8270	not significant
084455 vs. 084458	5.3177	0.0369	not significant	3.8844	0.0688	not significant	0.8079	0.3839	not significant	9.9217	0.0071	not significant	3.2740	0.0919	not significant
084456 vs. 084457	0.8045	0.3849	not significant	2.4860	0.1372	not significant	0.4815	0.4991	not significant	0.4561	0.5104	not significant	0.0079	0.9303	not significant
084456 vs. 084458	0.0854	0.7744	not significant	6.0023	0.0280	not significant	1.2386	0.2845	not significant	7.2886	0.0173	not significant	2.2433	0.1564	not significant
084457 vs. 084458	0.3656	0.5551	not significant	0.7626	0.3973	not significant	0.1756	0.6816	not significant	4.0981	0.0624	not significant	2.5179	0.1349	not significant

Some ANOVA-based comparison p-values for tester strains TA102 (+S9) and TA1537 (-S9) were significant at $\alpha = 0.05$.

Significant differences in mean 'Extracted Nicotine' specific activity slope were detected in TA102 (+S9) between Camel SNUS Frost (084394) and each of {Fresh Strips (084454), Ariva Wintergreen (084457), Fresh Orbs (084458)} and between 2S3 Research Moist Snuff (084395) and Fresh Orbs (084458).

**Pairwise T-Test Comparisons of Mean 'Extracted Nicotine' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

Pairwise T-test Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	1.107904	0.3300	not significant				2.322649	0.0809	not significant						
084394 vs. 084454	0.96473	0.3893	not significant				8.270391	0.0012	significant						
084394 vs. 084455	0.160766	0.8801	not significant				10.5229	0.0005	significant						
084394 vs. 084456	2.242299	0.0884	not significant				10.054	0.0006	significant						
084394 vs. 084457	1.035582	0.3589	not significant				13.08978	0.0002	significant						
084394 vs. 084458	0.721793	0.5104	not significant				3.842052	0.0184	not significant						
084395 vs. 084454	1.438034	0.2238	not significant				1.80363	0.1456	not significant						
084395 vs. 084455	1.002409	0.3729	not significant				1.280537	0.2696	not significant						
084395 vs. 084456	1.207692	0.2937	not significant				1.342492	0.2506	not significant						
084395 vs. 084457	2.279653	0.0848	not significant				2.119697	0.1014	not significant						
084395 vs. 084458	0.547582	0.6131	not significant				2.230461	0.0896	not significant						
084454 vs. 084455	0.823143	0.4567	not significant				1.559599	0.1939	not significant						
084454 vs. 084456	1.811397	0.1443	not significant				1.32213	0.2567	not significant						
084454 vs. 084457	0.498693	0.6442	not significant				0.424339	0.6931	not significant						
084454 vs. 084458	1.042686	0.3560	not significant				1.432955	0.2252	not significant						
084455 vs. 084456	1.748984	0.1552	not significant				0.366923	0.7323	not significant						
084455 vs. 084457	0.654449	0.5485	not significant				6.064888	0.0037	not significant						
084455 vs. 084458	0.751095	0.4944	not significant				1.833083	0.1407	not significant						
084456 vs. 084457	3.607046	0.0226	not significant				3.994206	0.0162	not significant						
084456 vs. 084458	0.418283	0.6972	not significant				1.78734	0.1484	not significant						
084457 vs. 084458	0.907888	0.4153	not significant				1.369265	0.2428	not significant						

**Pairwise T-Test Comparisons of Mean 'Extracted Nicotine' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

Pairwise T-test Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084395				0.346383	0.7465	not significant	1.437174	0.2240	not significant	0.283278	0.7910	not significant			
084394 vs. 084454				0.763552	0.4877	not significant	1.149923	0.3143	not significant	3.669446	0.0214	not significant			
084394 vs. 084455				0.189722	0.8588	not significant	1.439236	0.2235	not significant	0.982292	0.3816	not significant			
084394 vs. 084456				0.653188	0.5493	not significant	1.16606	0.3084	not significant	1.549086	0.1963	not significant			
084394 vs. 084457				1.008708	0.3702	not significant	2.035651	0.1115	not significant	1.091021	0.3366	not significant			
084394 vs. 084458				2.631482	0.0581	not significant	0.661351	0.5445	not significant	1.79847	0.1465	not significant			
084395 vs. 084454				0.706615	0.5188	not significant	1.032464	0.3602	not significant	3.688684	0.0210	not significant			
084395 vs. 084455				0.151208	0.8871	not significant	0.11205	0.9162	not significant	1.293404	0.2655	not significant			
084395 vs. 084456				0.738798	0.5010	not significant	0.624118	0.5664	not significant	1.487539	0.2111	not significant			
084395 vs. 084457				0.983182	0.3812	not significant	2.97552	0.0409	not significant	1.046693	0.3543	not significant			
084395 vs. 084458				2.602967	0.0599	not significant	0.81225	0.4622	not significant	1.775228	0.1505	not significant			
084454 vs. 084455				0.227202	0.8314	not significant	1.042147	0.3562	not significant	4.060383	0.0153	not significant			
084454 vs. 084456				1.0224	0.3644	not significant	0.876775	0.4301	not significant	2.743654	0.0517	not significant			
084454 vs. 084457				0.637951	0.5582	not significant	1.367552	0.2433	not significant	0.03622	0.9728	not significant			
084454 vs. 084458				1.810734	0.1444	not significant	1.316788	0.2583	not significant	1.205618	0.2944	not significant			
084455 vs. 084456				0.478868	0.6570	not significant	0.672578	0.5381	not significant	2.27029	0.0857	not significant			
084455 vs. 084457				0.715698	0.5137	not significant	3.015153	0.0394	not significant	1.313646	0.2592	not significant			
084455 vs. 084458				1.644287	0.1755	not significant	0.80106	0.4680	not significant	1.915173	0.1280	not significant			
084456 vs. 084457				1.180273	0.3033	not significant	2.049669	0.1097	not significant	0.796347	0.4704	not significant			
084456 vs. 084458				2.627824	0.0583	not significant	0.958438	0.3921	not significant	1.646001	0.1751	not significant			
084457 vs. 084458				0.586035	0.5893	not significant	0.371449	0.7291	not significant	1.100309	0.3330	not significant			

Pairwise t-test comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean 'Extracted Nicotine' specific activity slope were as follows for strain TA102 (+S9):

TA102 (+S9): Camel SNUS Frost (084394) was significantly different from each of {Fresh Strips (084454), Mellow Sticks (084455), Copenhagen Long Cut (084456), Ariva Wintergreen (084457)}

**Number of Mean 'Extracted Nicotine' Slope Estimates
Significantly Greater than Zero (0), the Corresponding Number
of Paired Comparisons and Comparison Method**

Strain and S9 Activation	# of Significant Mean Slopes	Number of Comparisons	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	1	0		
TA98 (-S9)	1	0		
TA100 (+S9)	2	1	2.7	ANOVA (equal variance)
TA100 (-S9)	1	0		
TA102 (+S9)	2	1	3.2	ANOVA (equal variance)
TA102 (-S9)	0	0		
TA1535 (+S9)	0	0		
TA1535 (-S9)	0	0		
TA1537 (+S9)	0	0		
TA1537 (-S9)	0	0		

**One-Way ANOVA and ANOVA-Based Comparisons Among
Test Samples of Mean 'Extracted Nicotine' Slope Estimates
that are Significantly Greater than Zero (0)**

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	6.941	1	6.941	7.170	0.055
Within Samples	3.872	4	0.968		
Total (Corr.)	10.813	5			

TA100 (+S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084454 vs. 084456	7.17	0.0554	not significant

TA102 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	17.062	1	17.06	110.73	0.000
Within Samples	0.616	4	0.154		
Total (Corr.)	17.678	5			

TA102 (+S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084455	110.73	0.0005	significant

Both TA100 (+S9) and TA102 (+S9) strains have more than one test sample for which the mean 'extracted nicotine' specific activity slope estimate is greater than zero (0) .

TA100 (+S9):

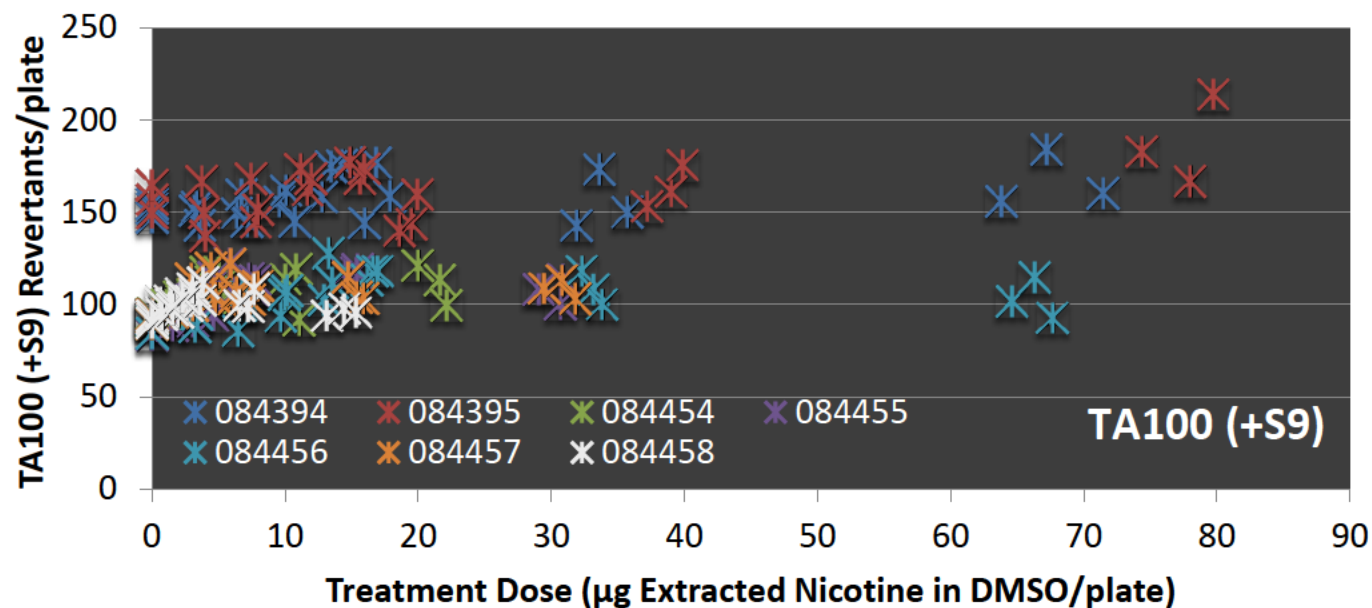
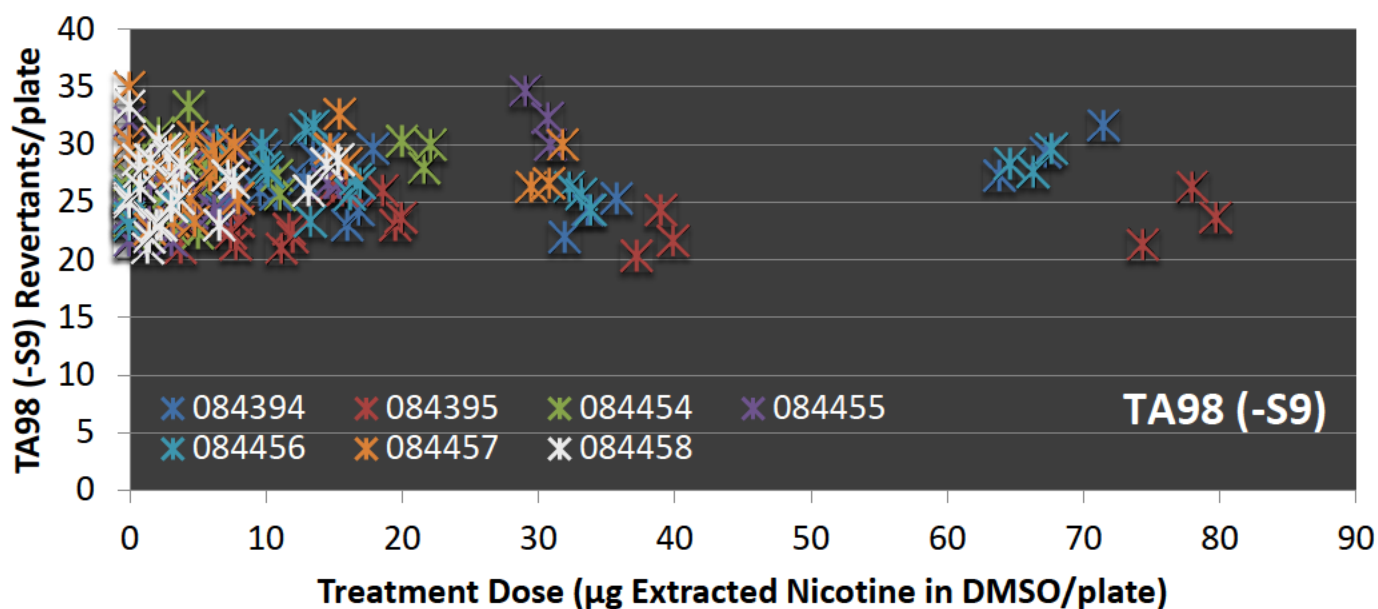
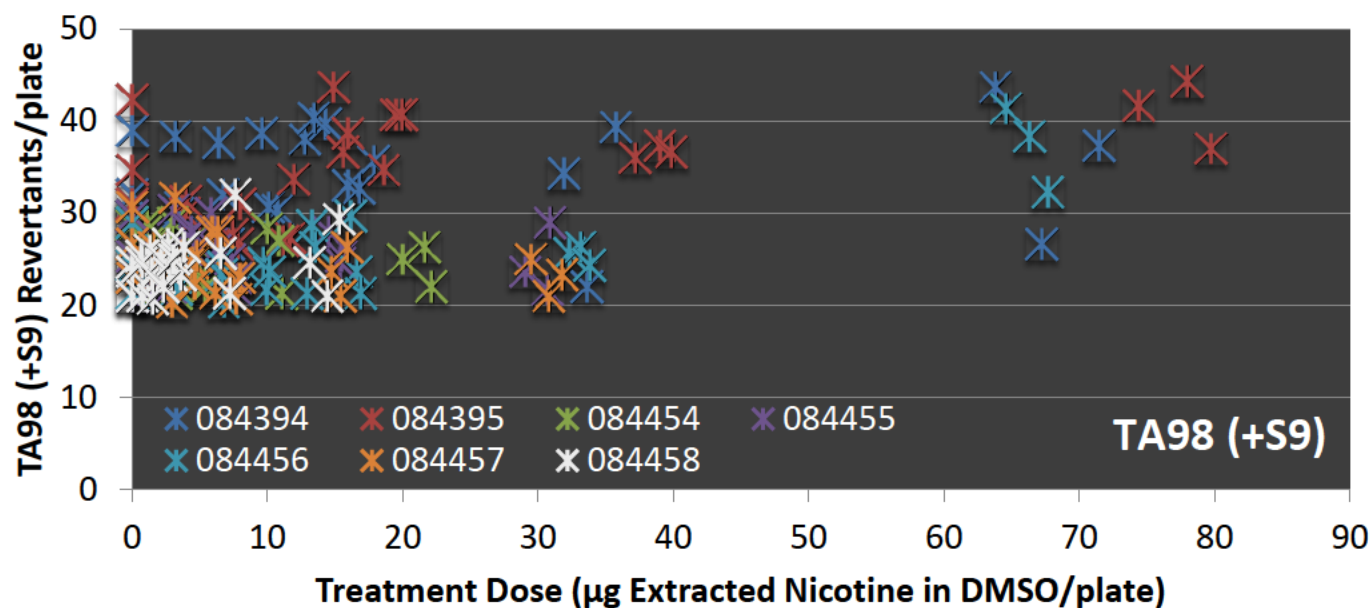
No significant differences among mean 'Extracted Nicotine' specific activity slope estimates were detected in TA100 (+S9) between test samples 084454 (Fresh Strips) and 084456 (Copenhagen Long Cut).

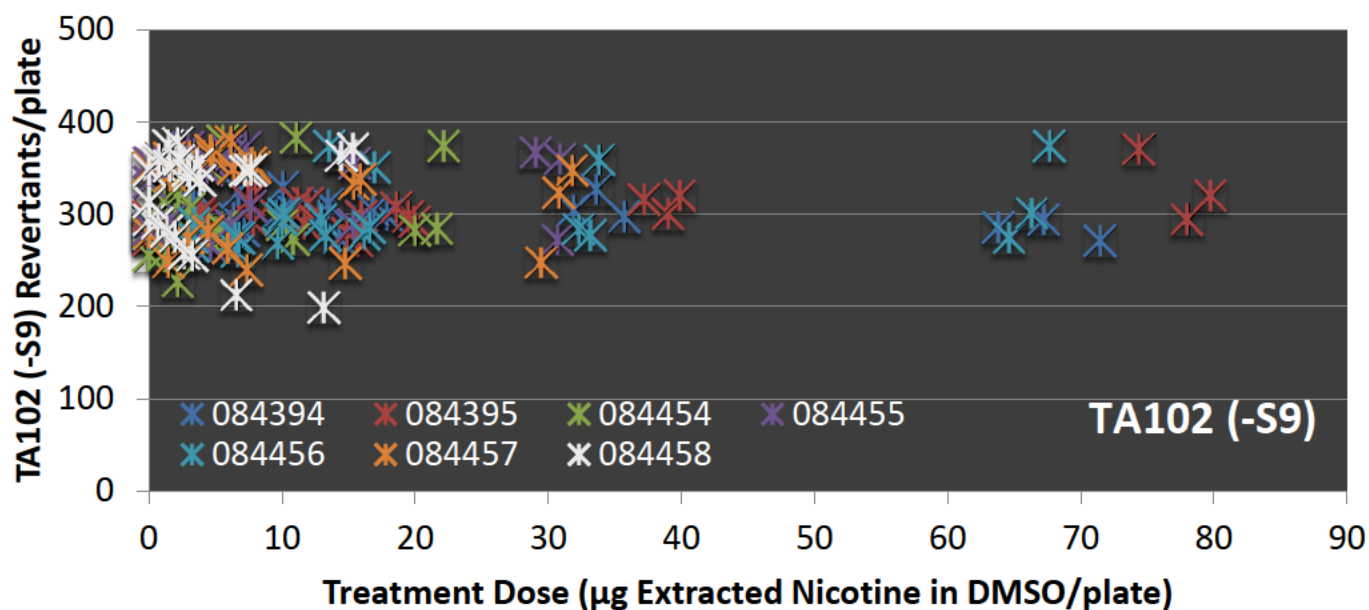
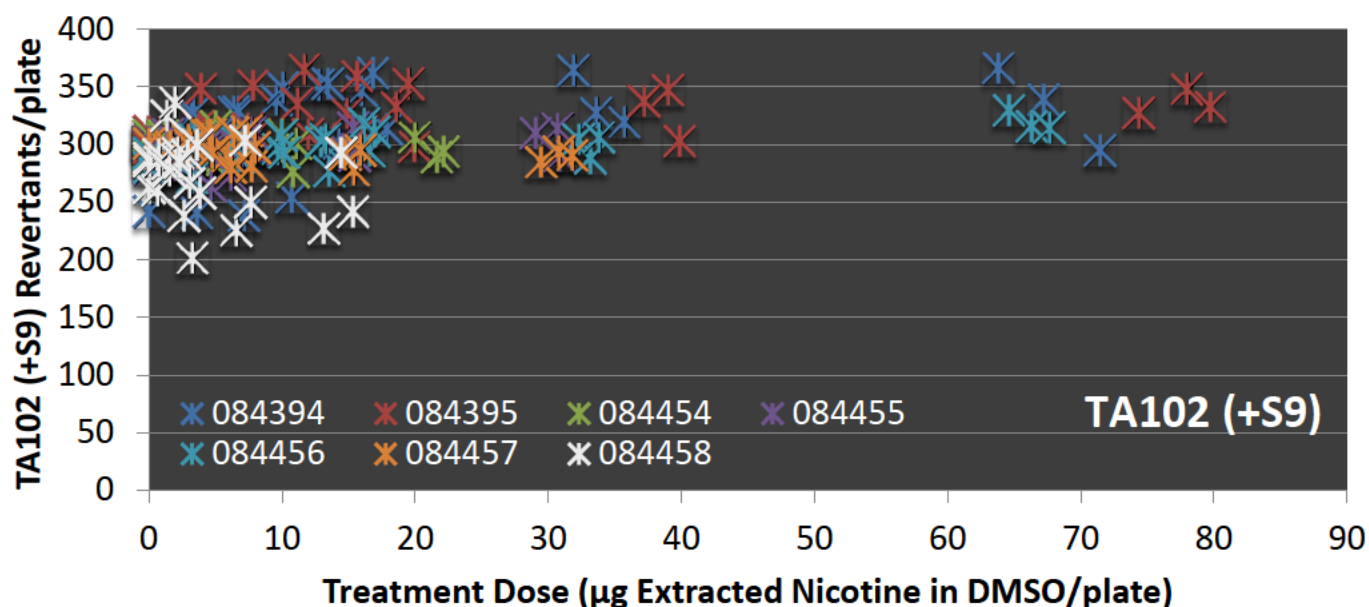
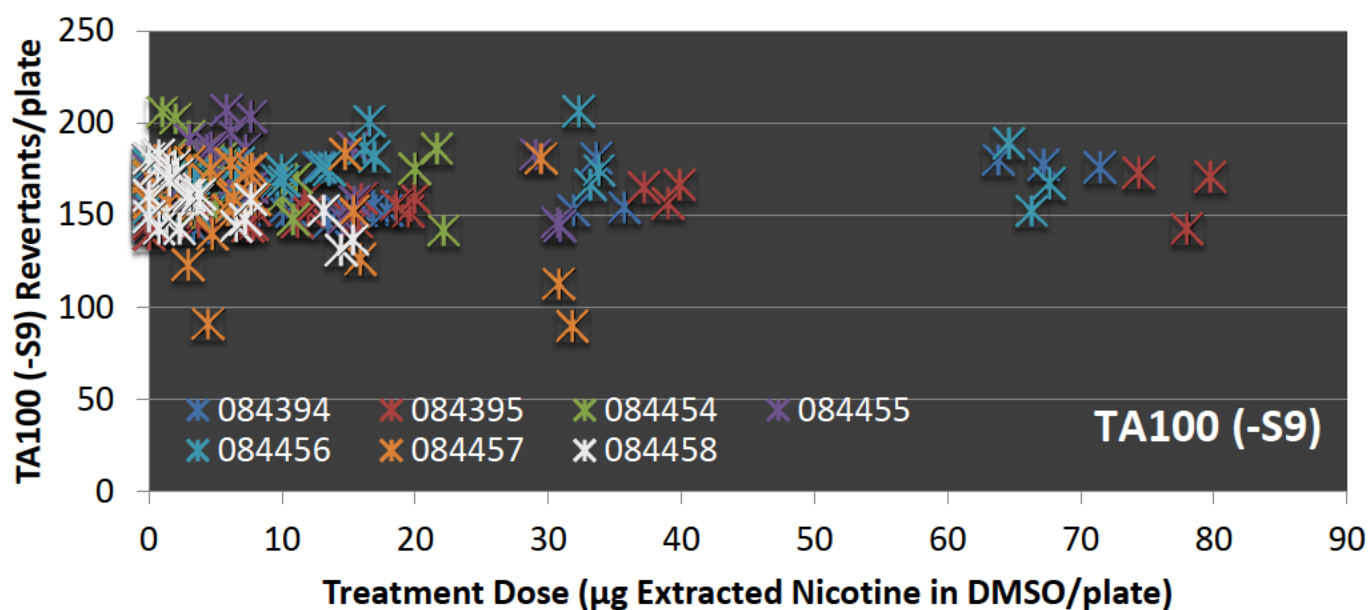
TA102 (+S9):

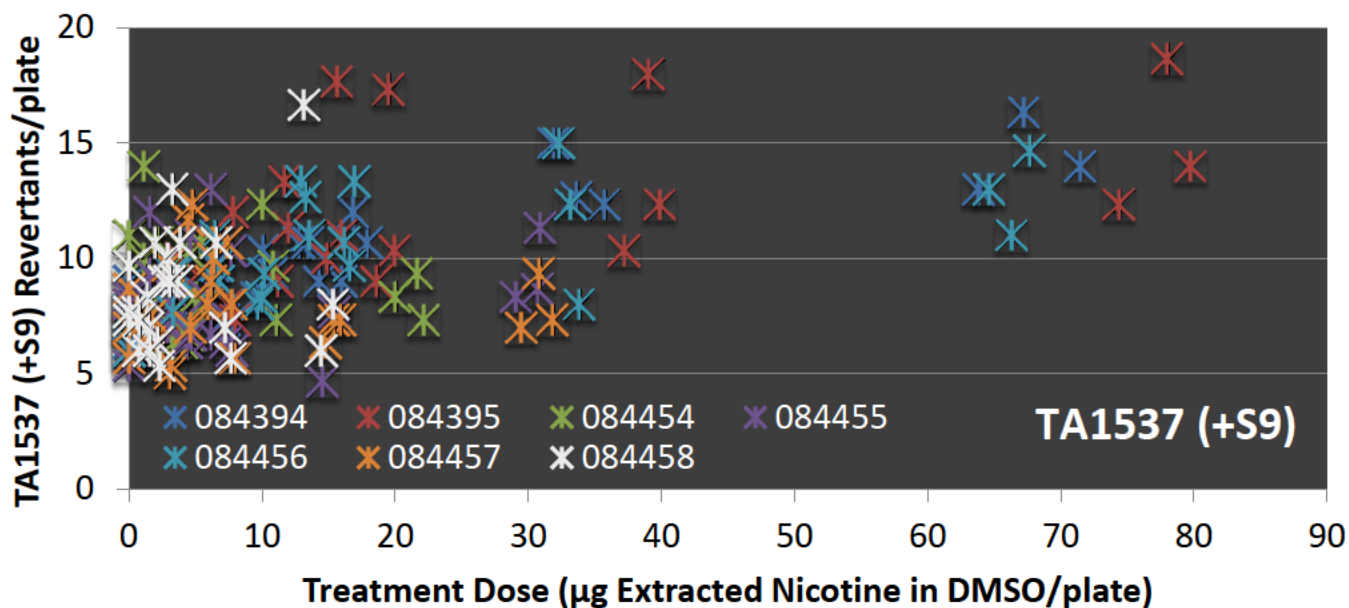
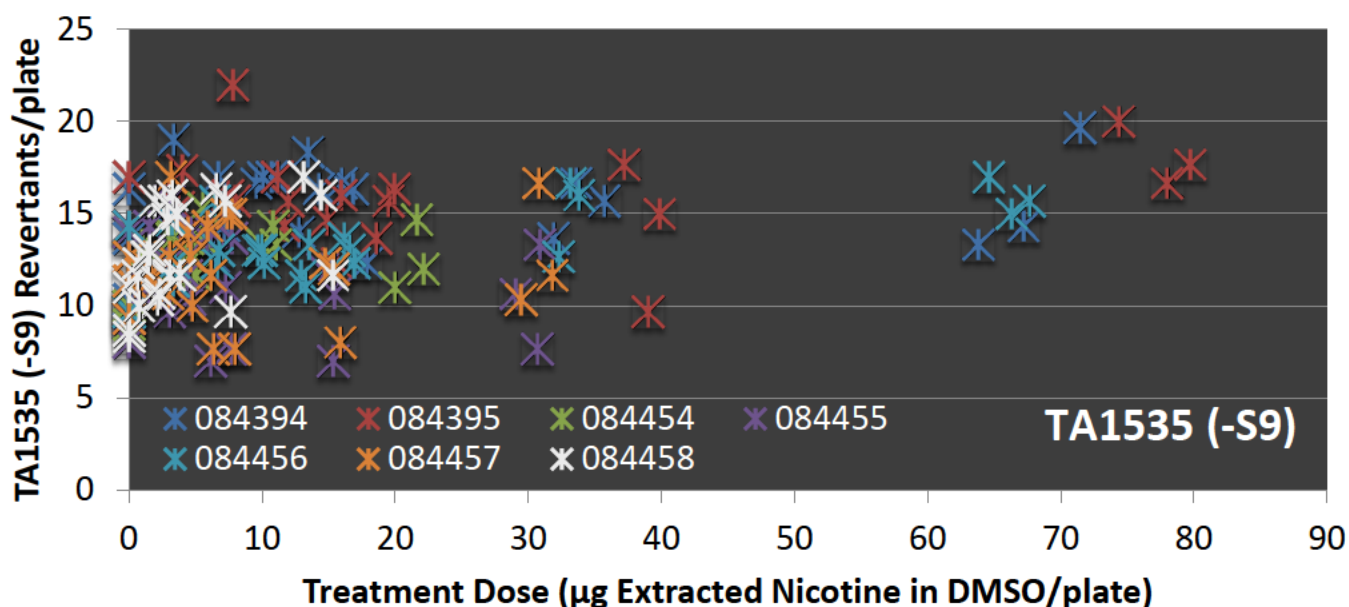
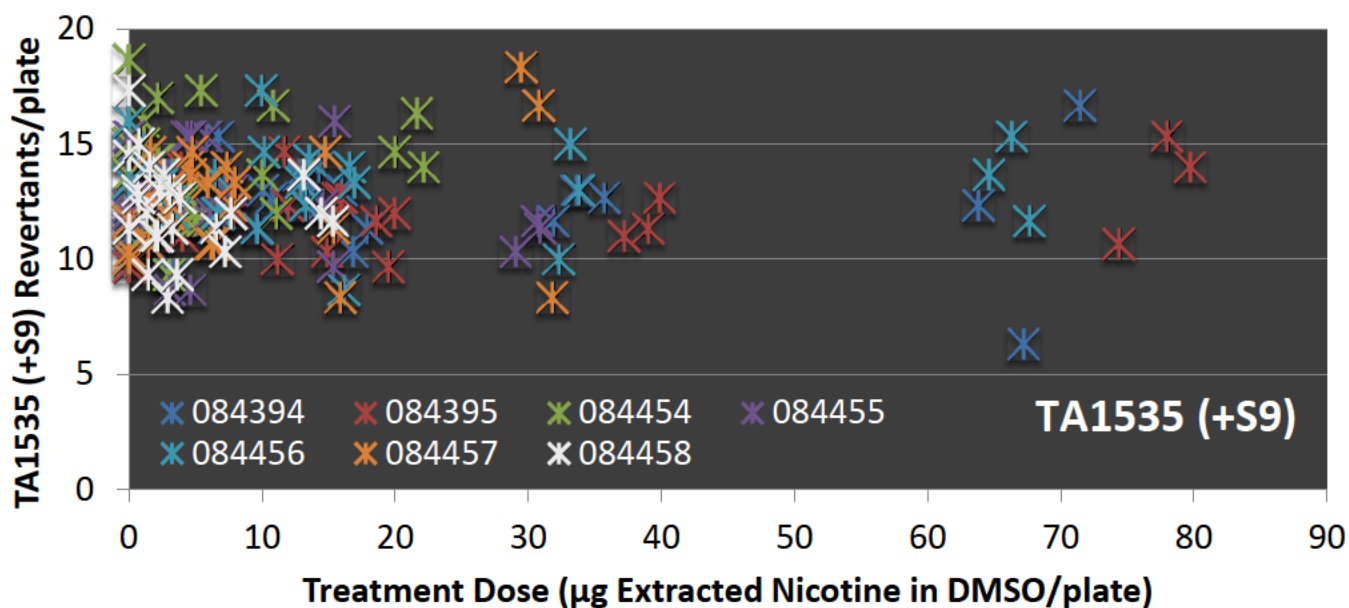
Significant differences among mean 'Extracted Nicotine' specific activity slope estimates were detected in TA102 (+S9) between test samples 084394 (Camel SNUS Frost) and 084455 (Mellow Sticks).

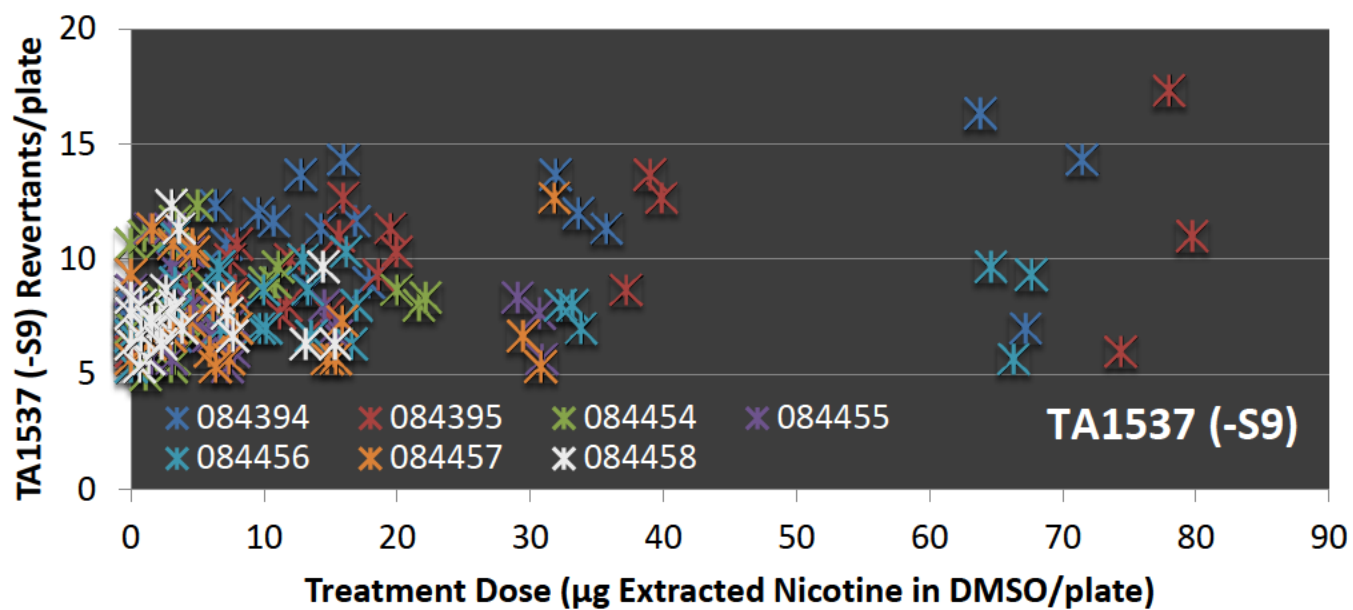
**Number of Mean 'Extracted Nicotine' Slope Estimates
Significantly Greater than Zero (0), the Corresponding Number
of Paired Comparisons and Comparison Method**

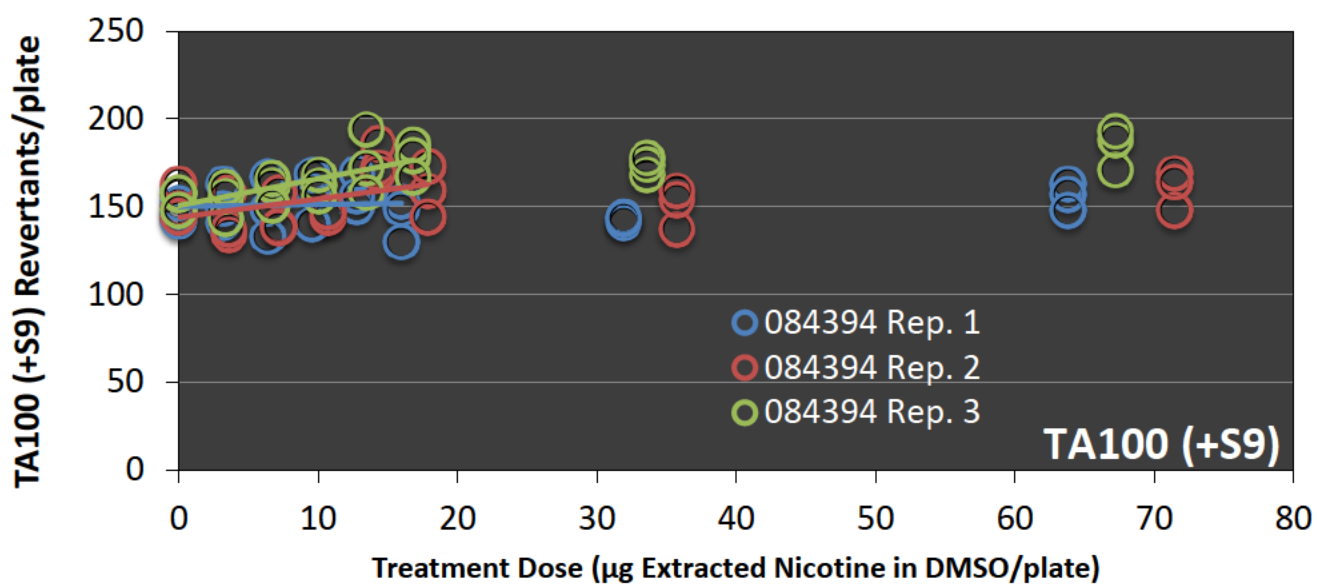
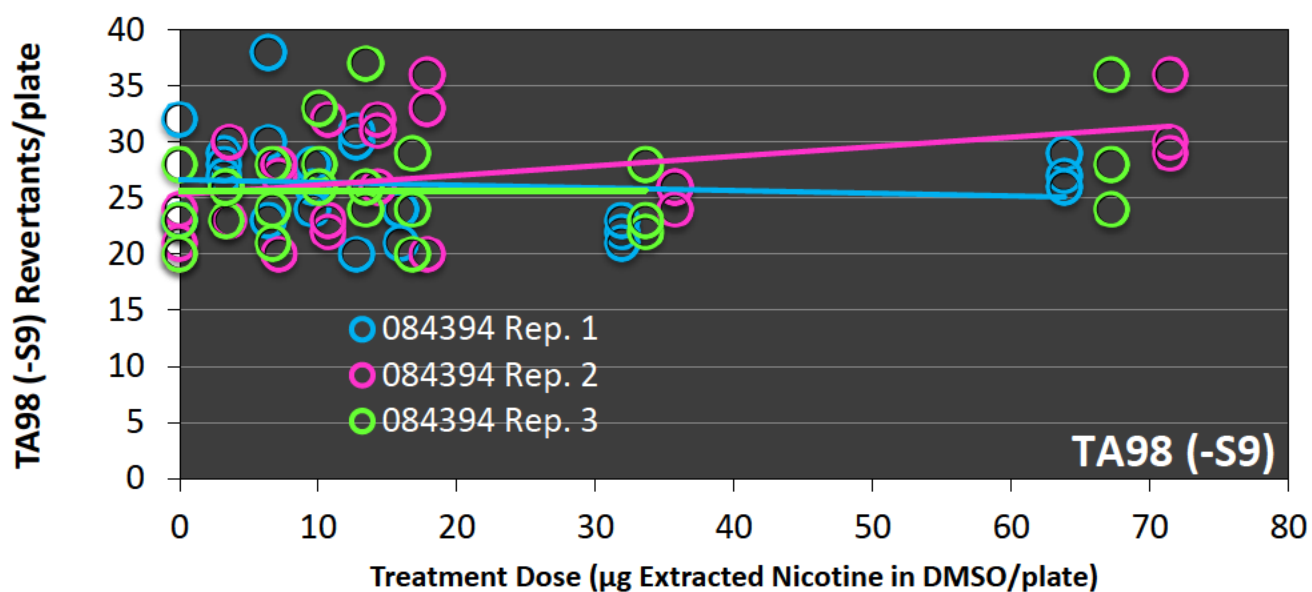
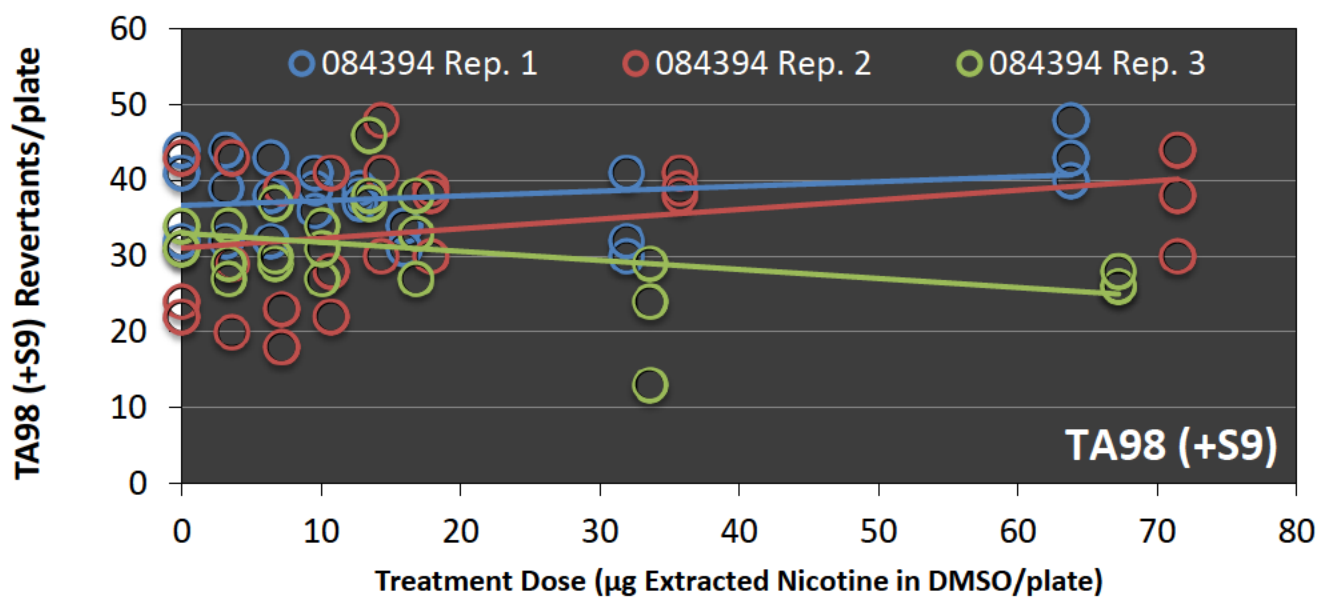
**One-Way ANOVA and ANOVA-Based Comparisons Among
Test Samples of Mean 'Extracted Nicotine' Slope Estimates
that are Significantly Greater than Zero (0)**

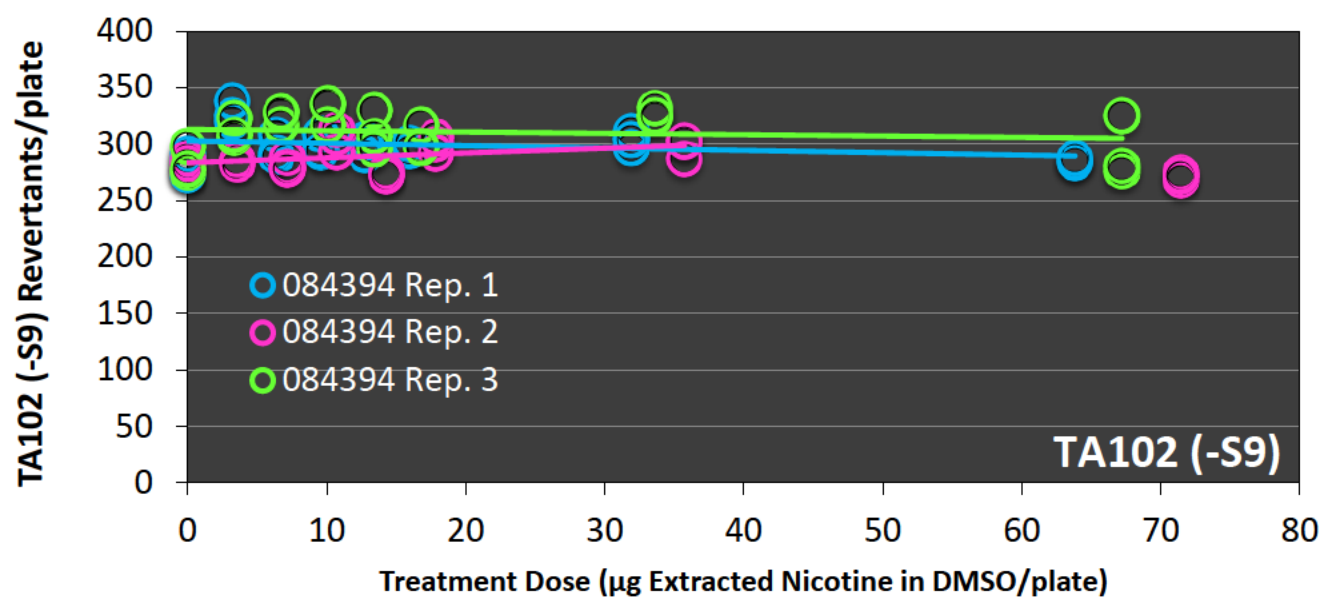
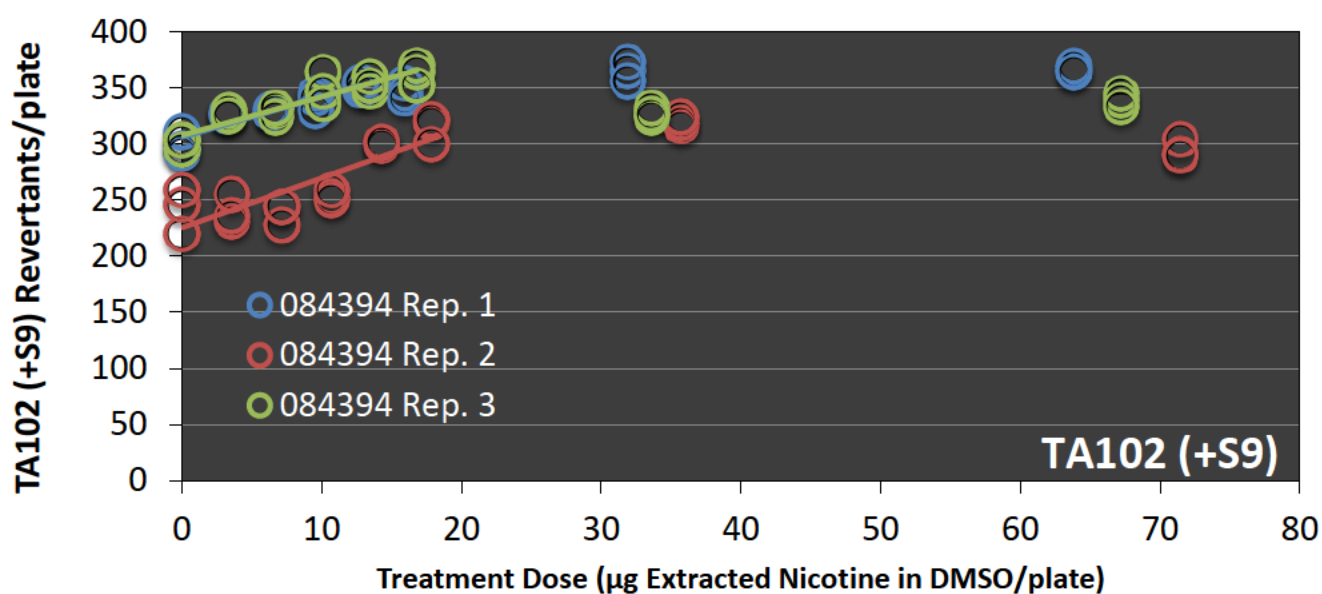
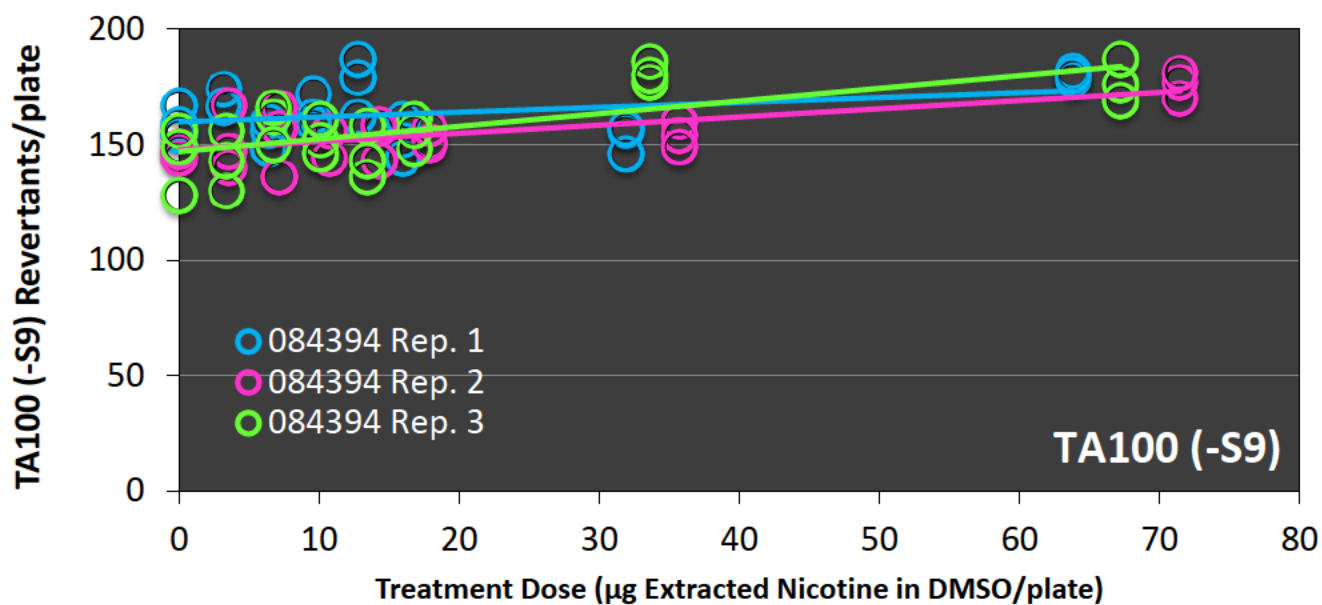


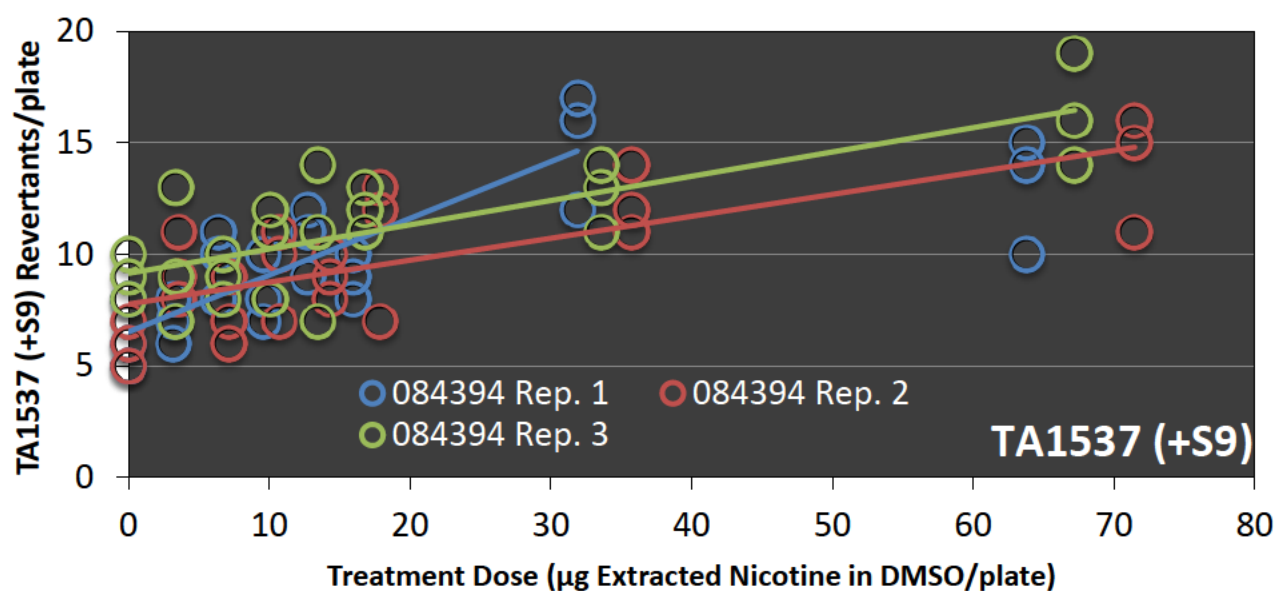
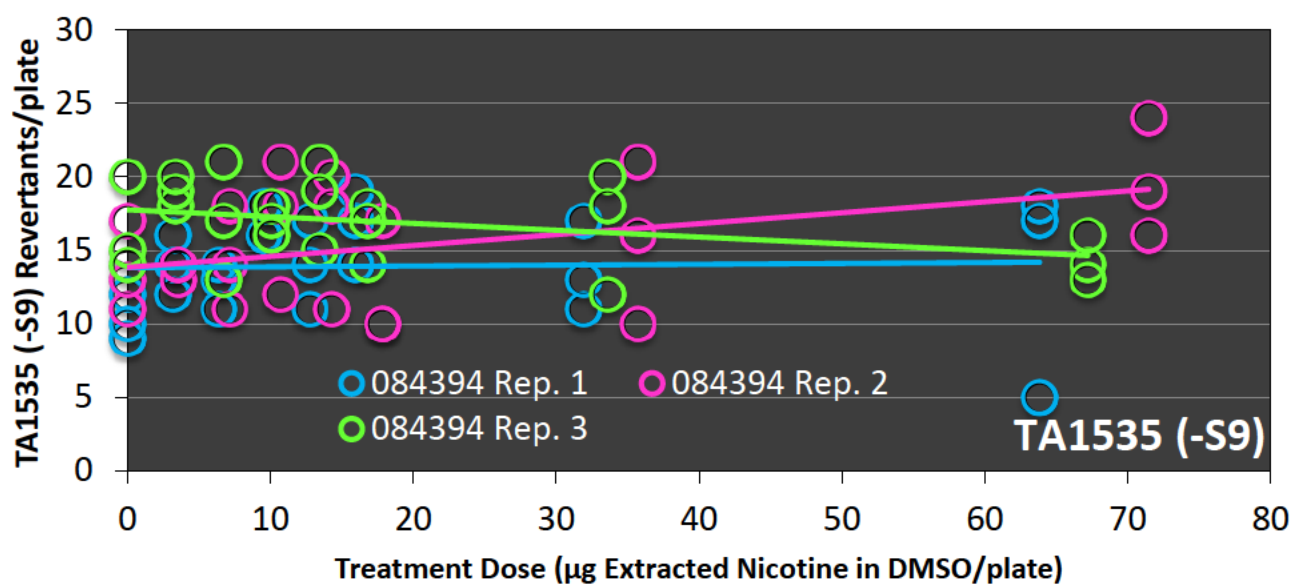
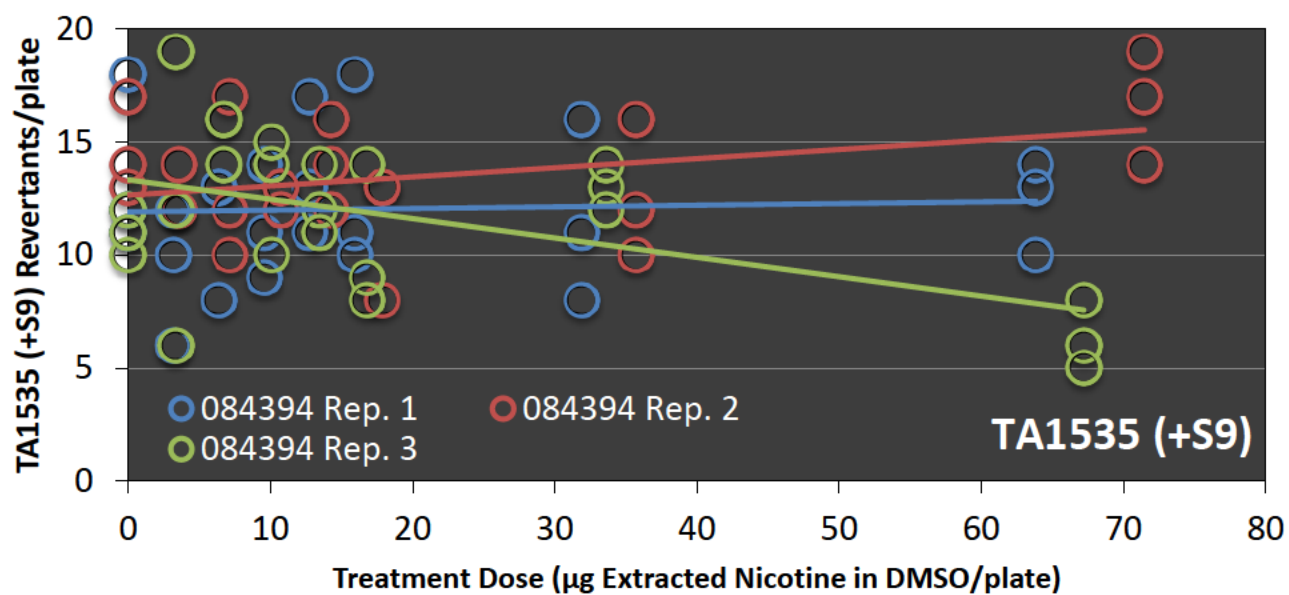


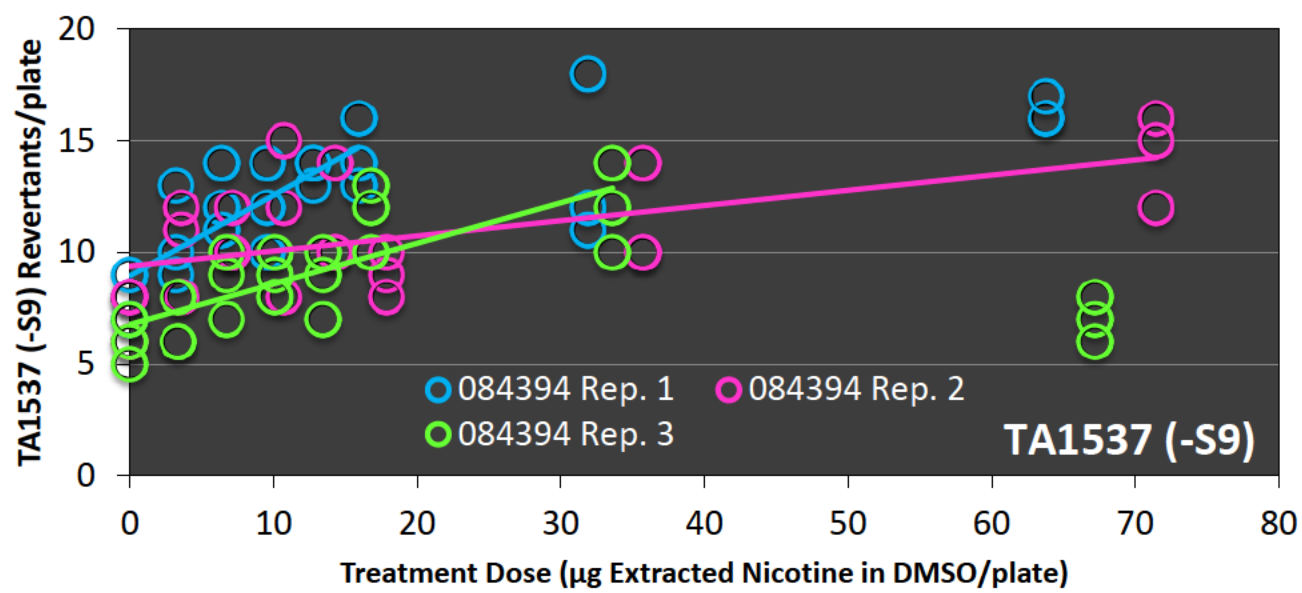


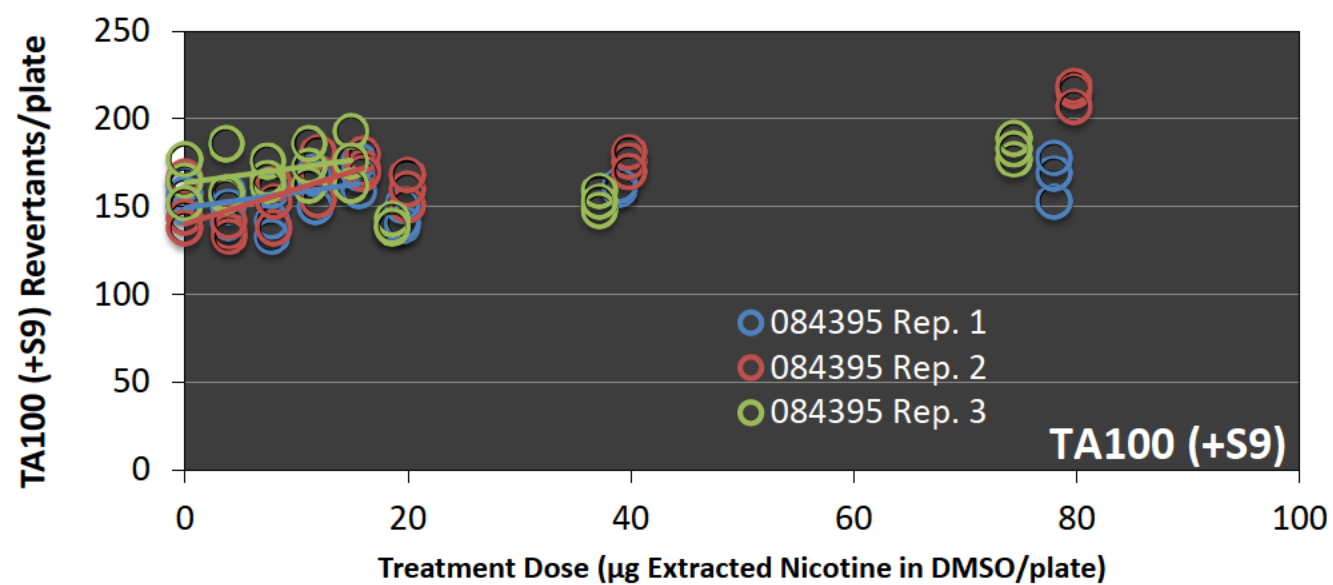
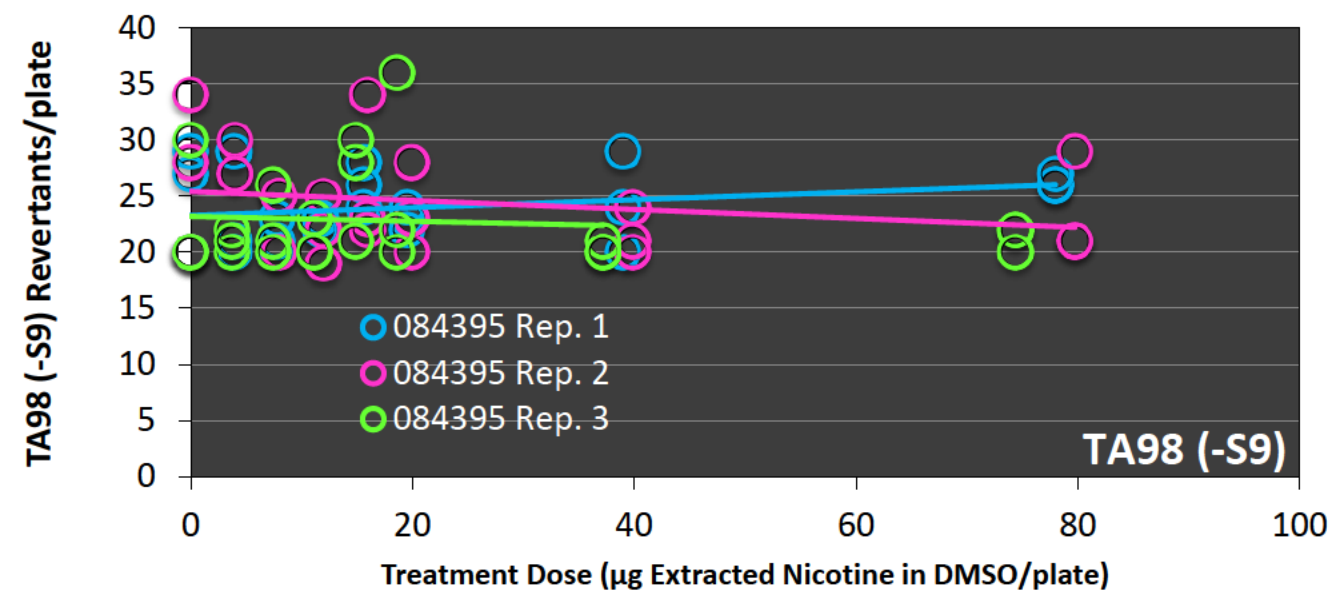
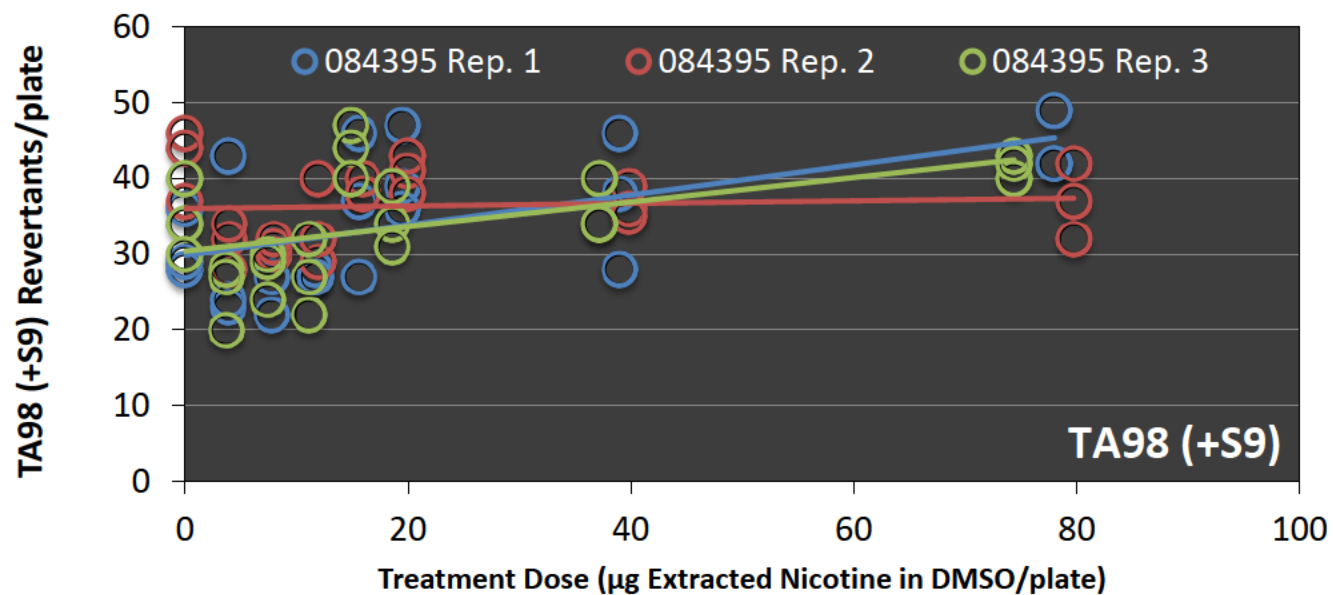


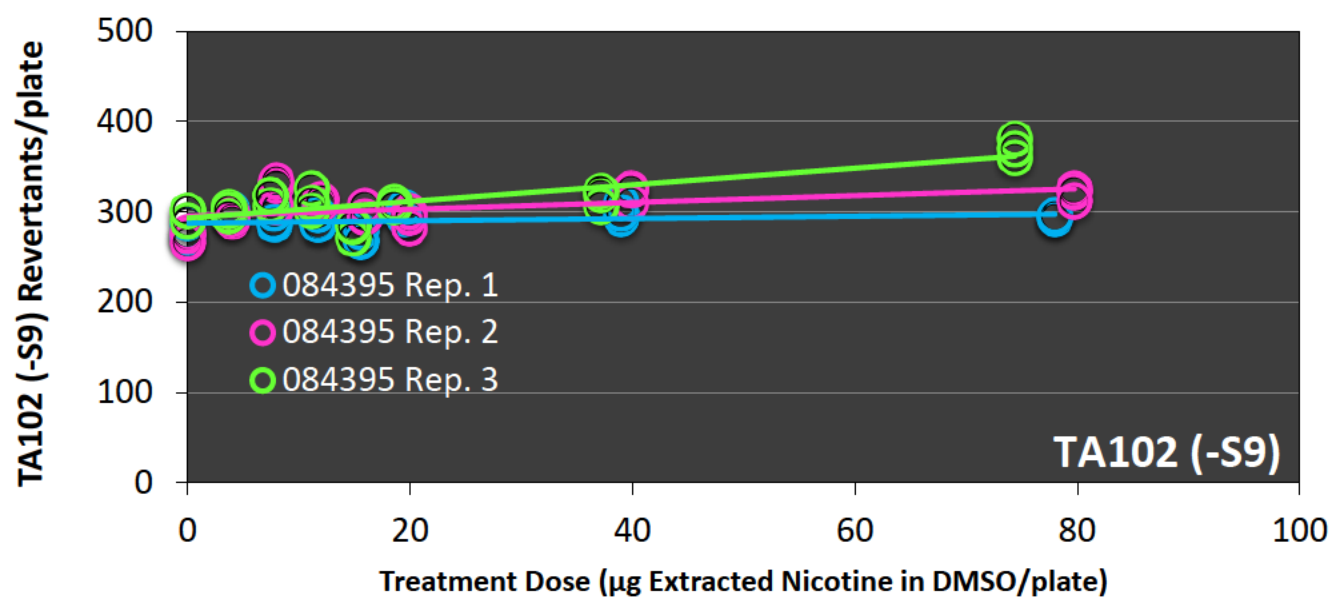
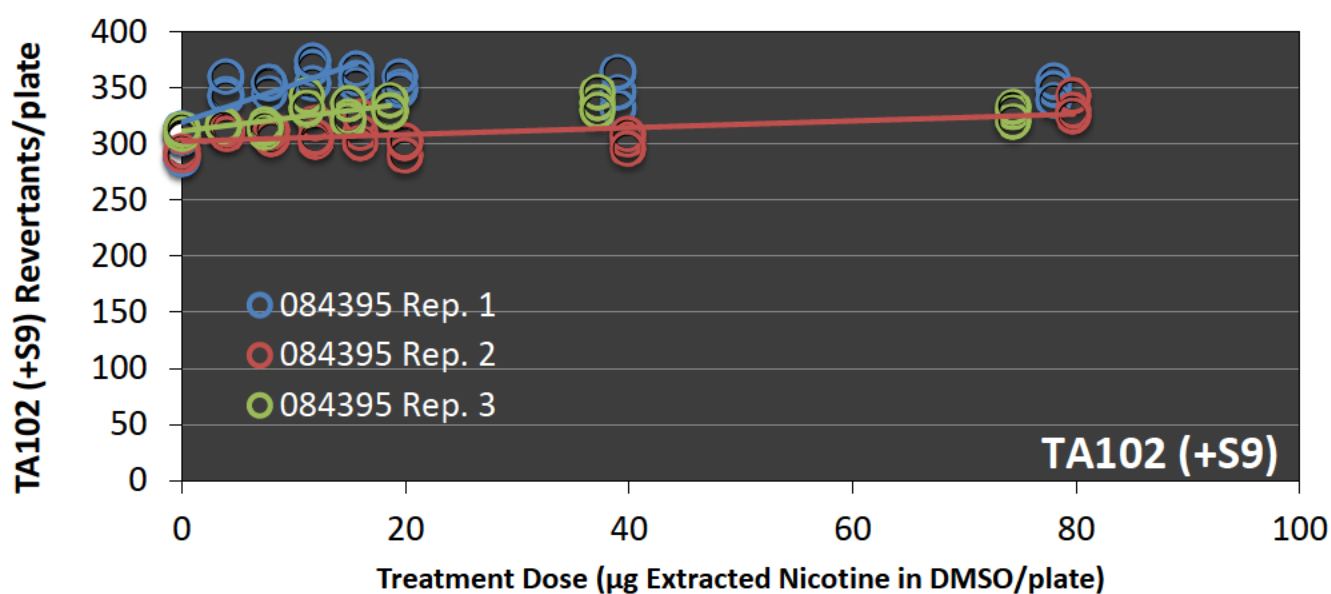
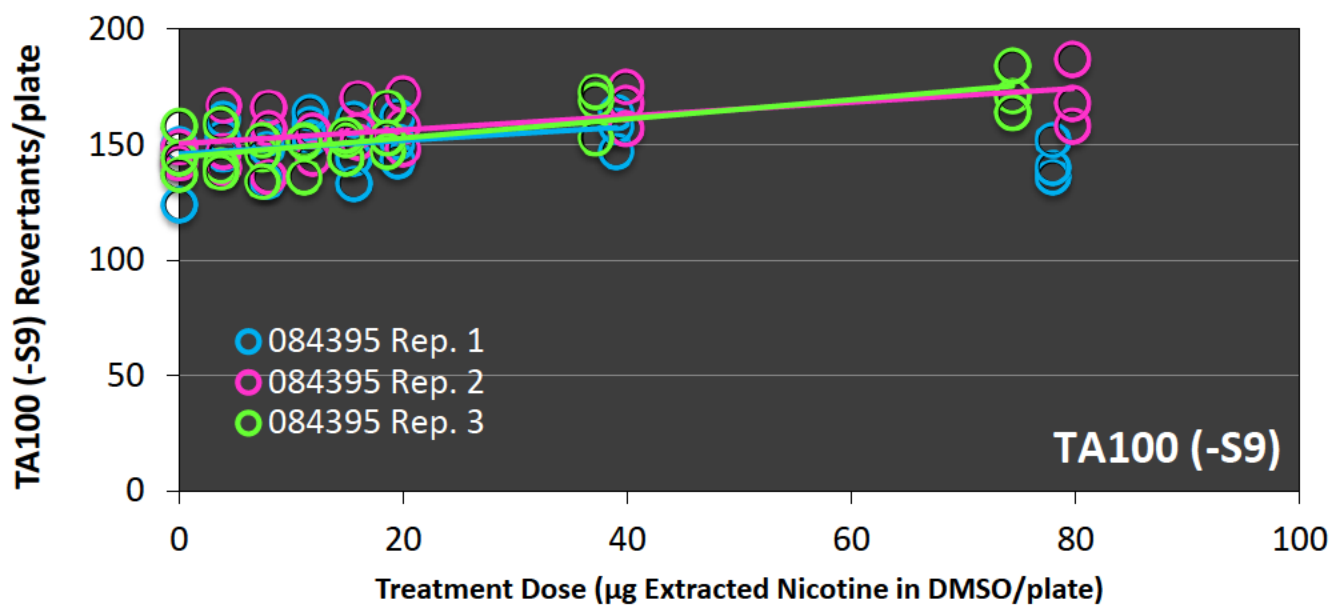


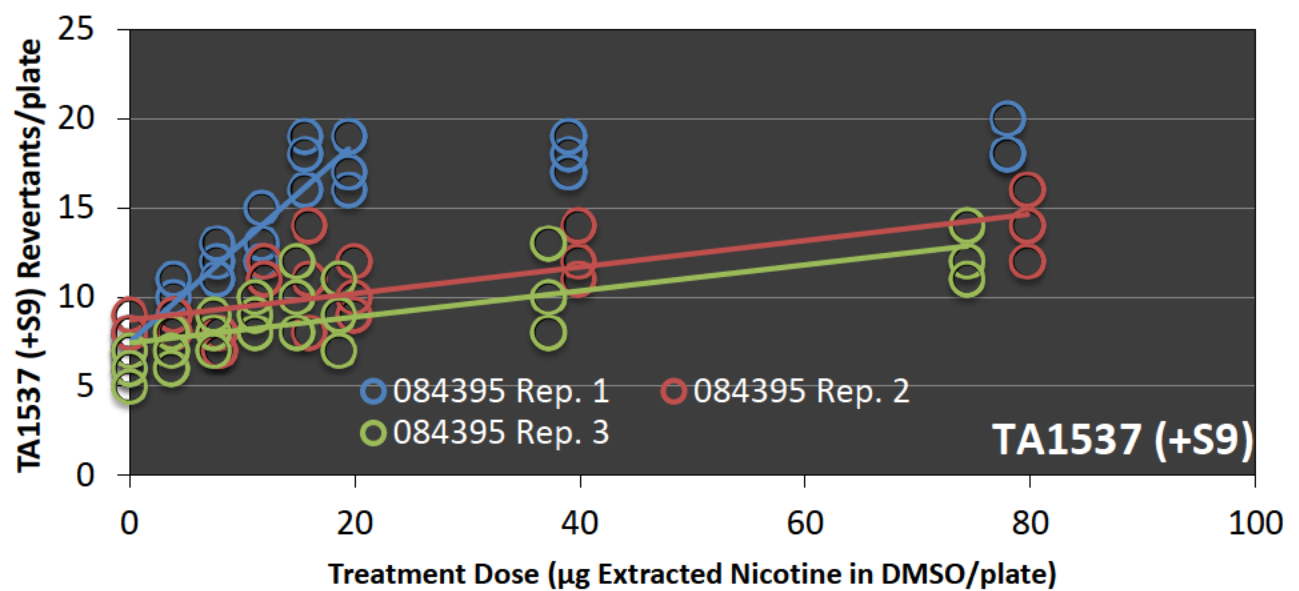
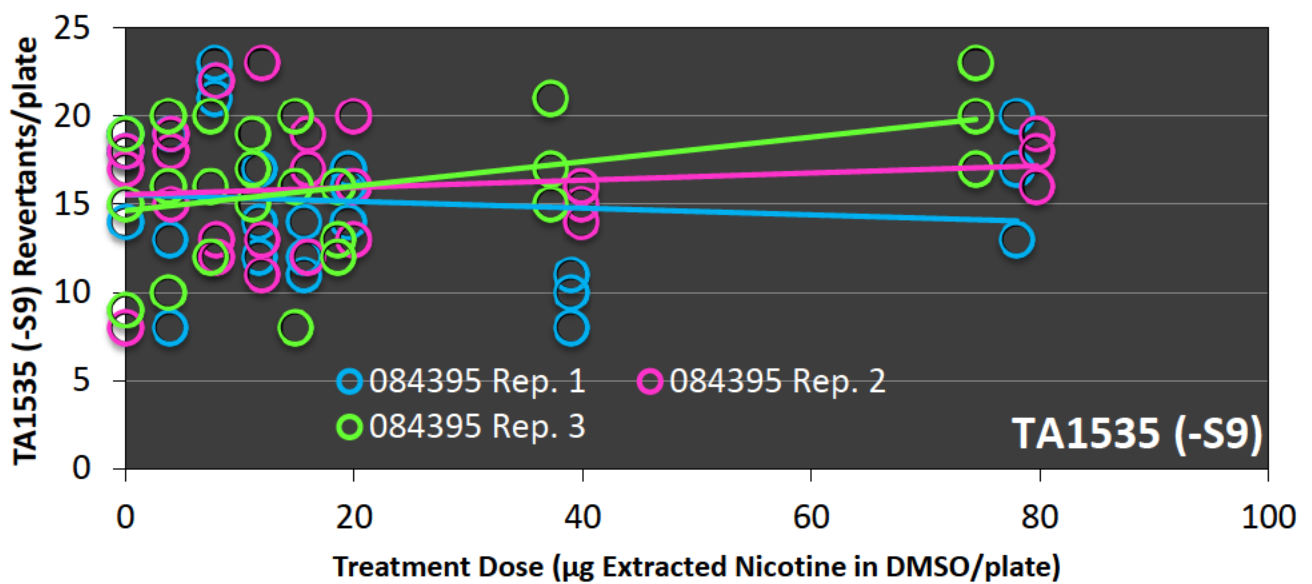
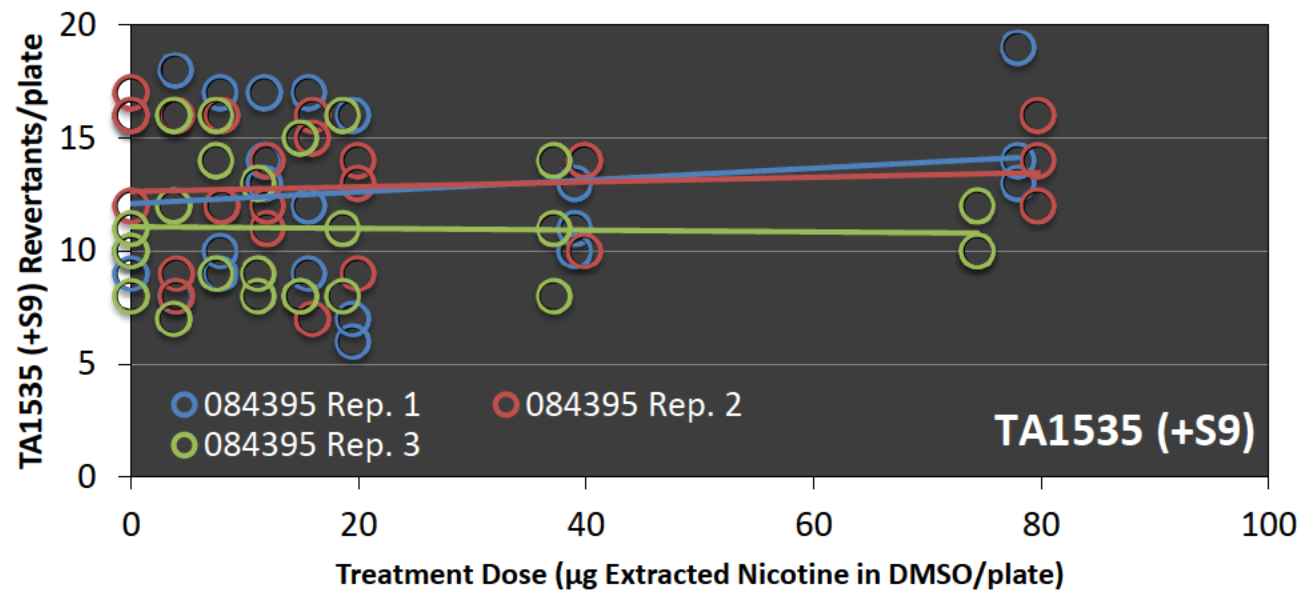


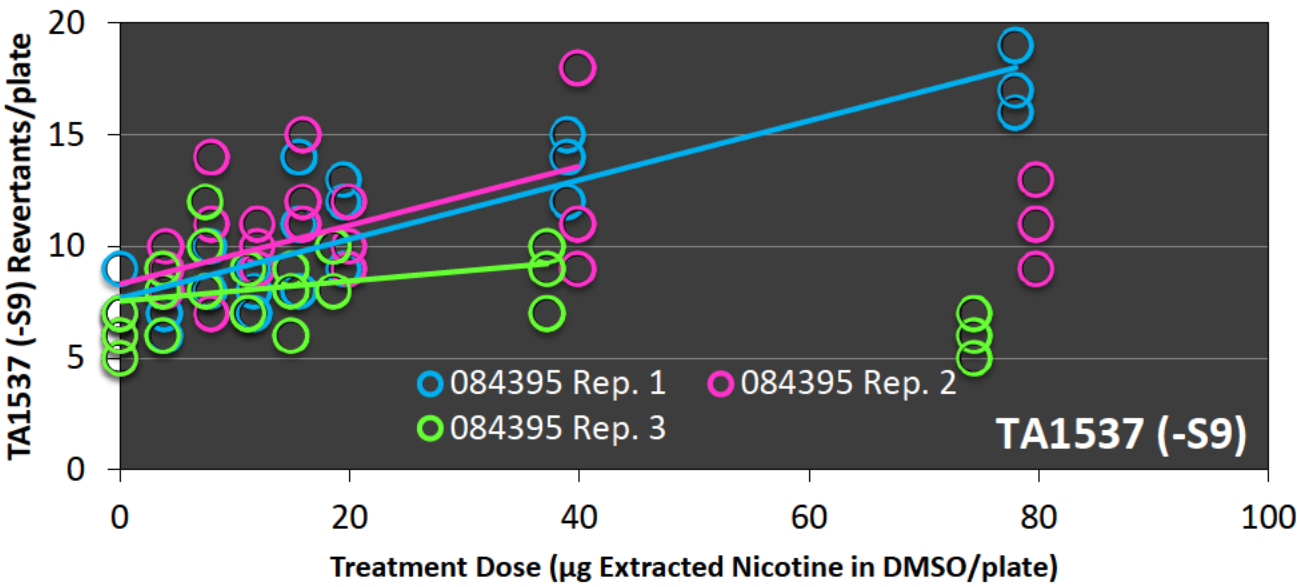


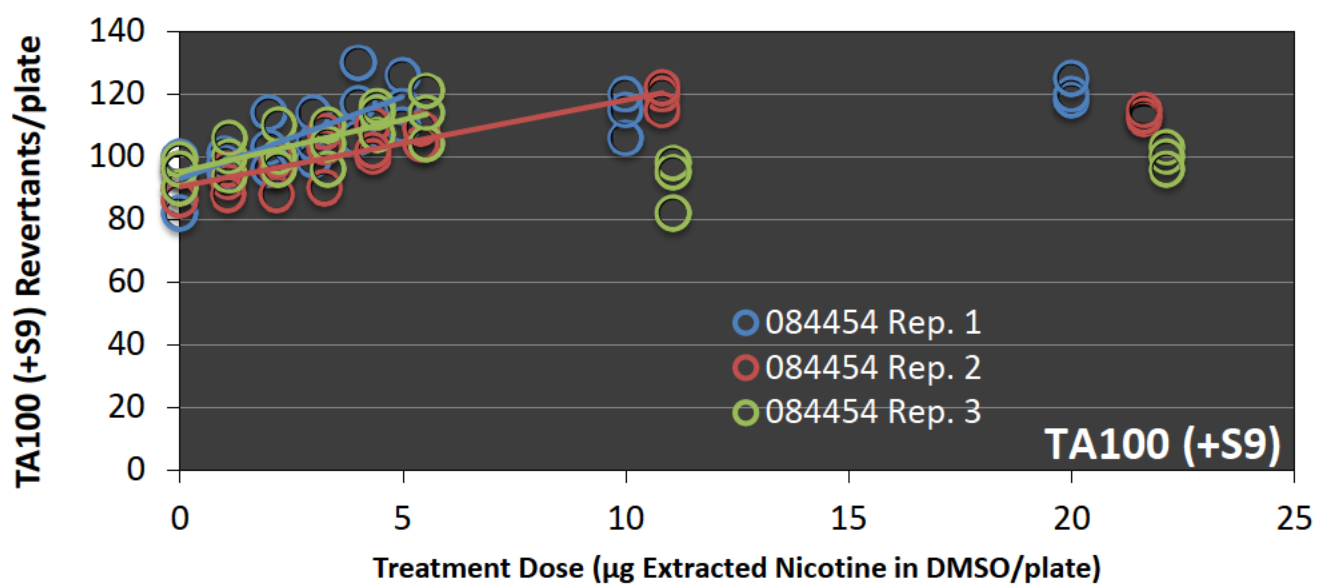
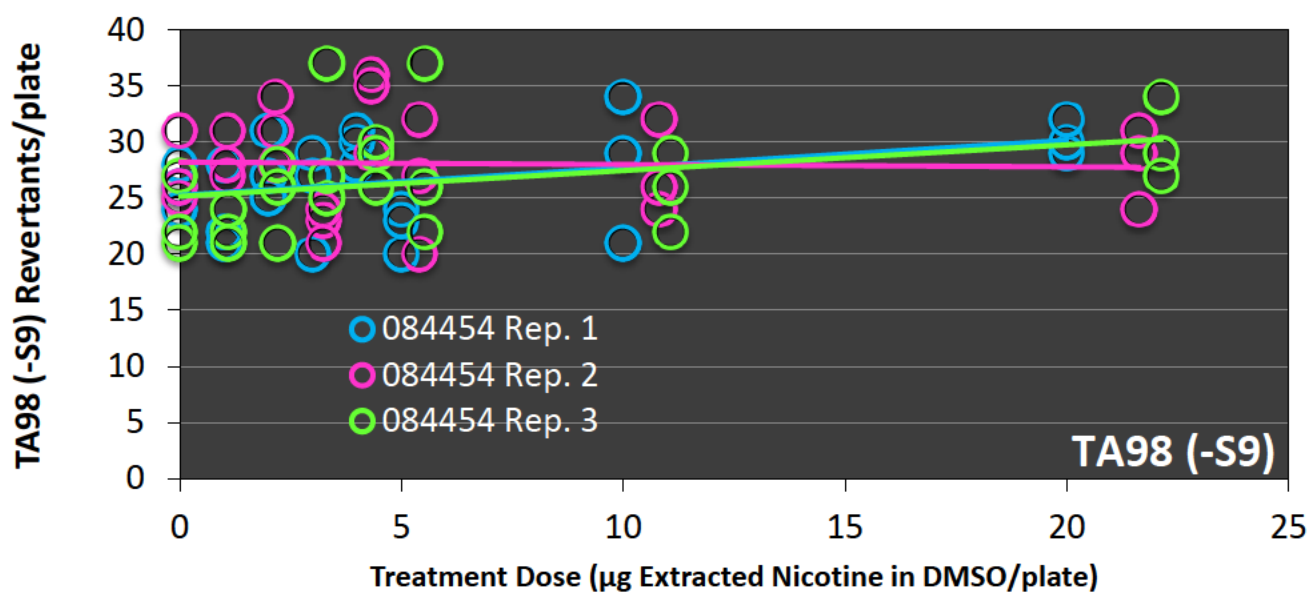
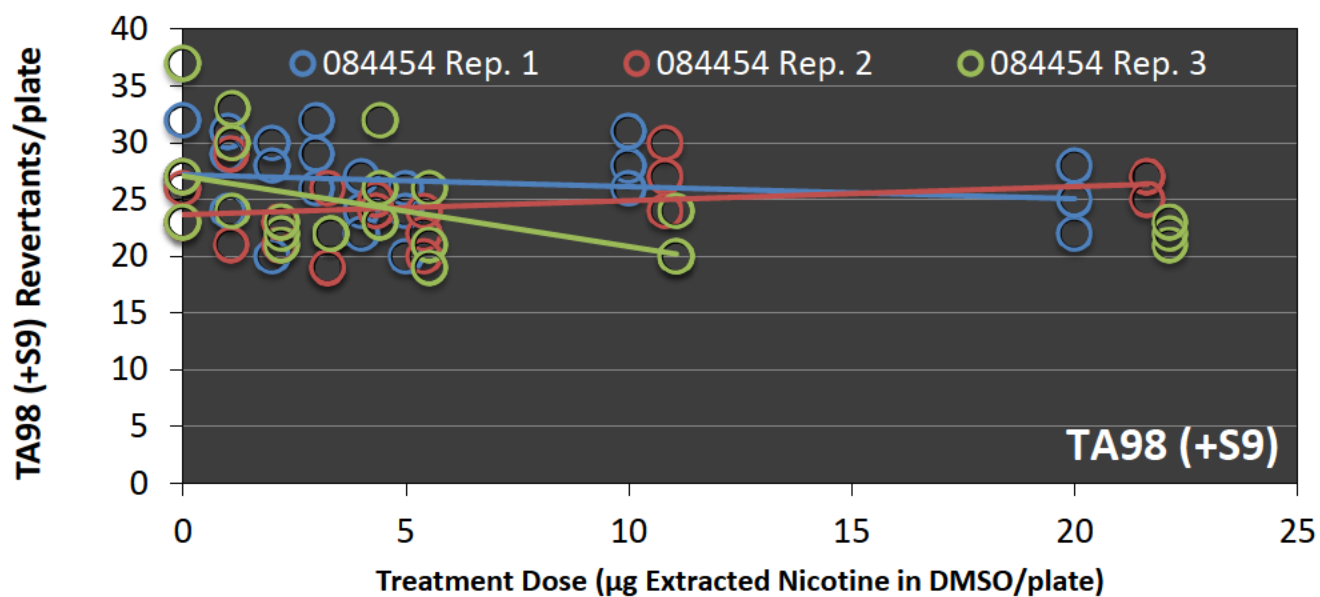


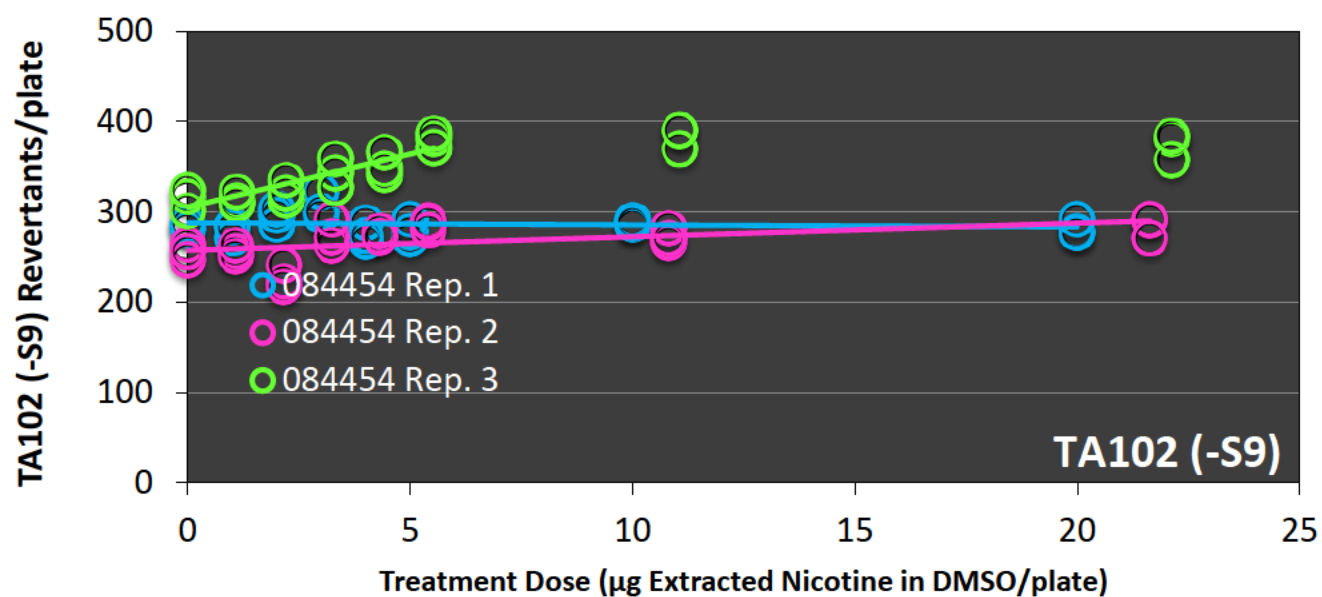
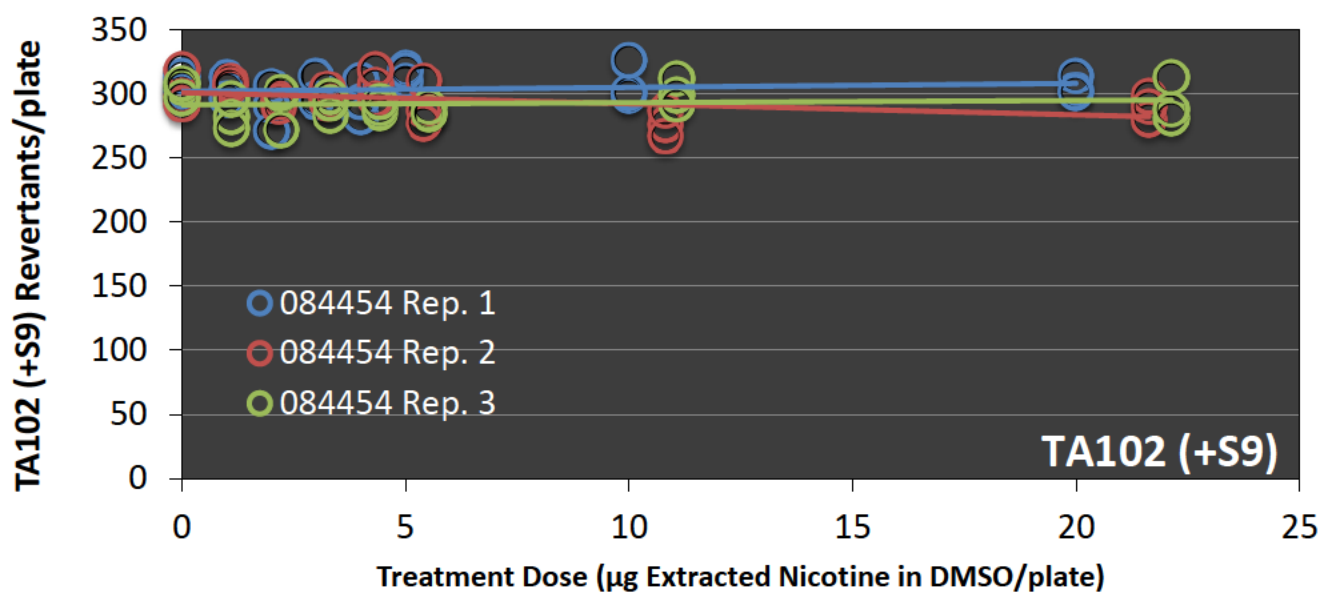
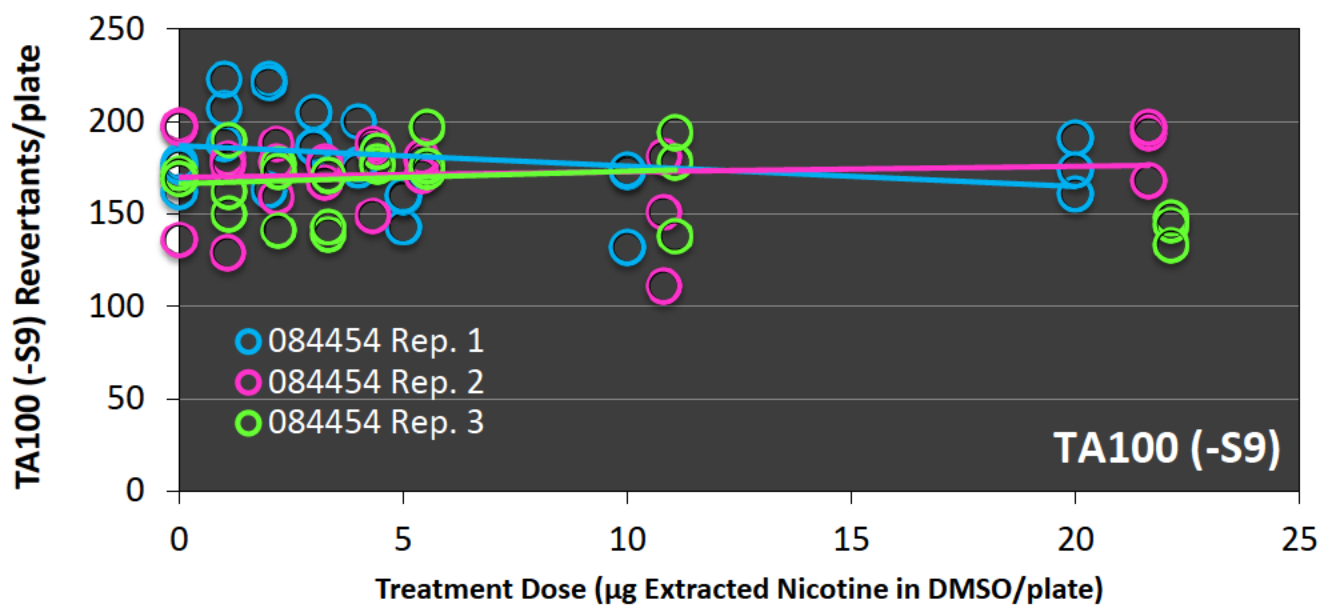


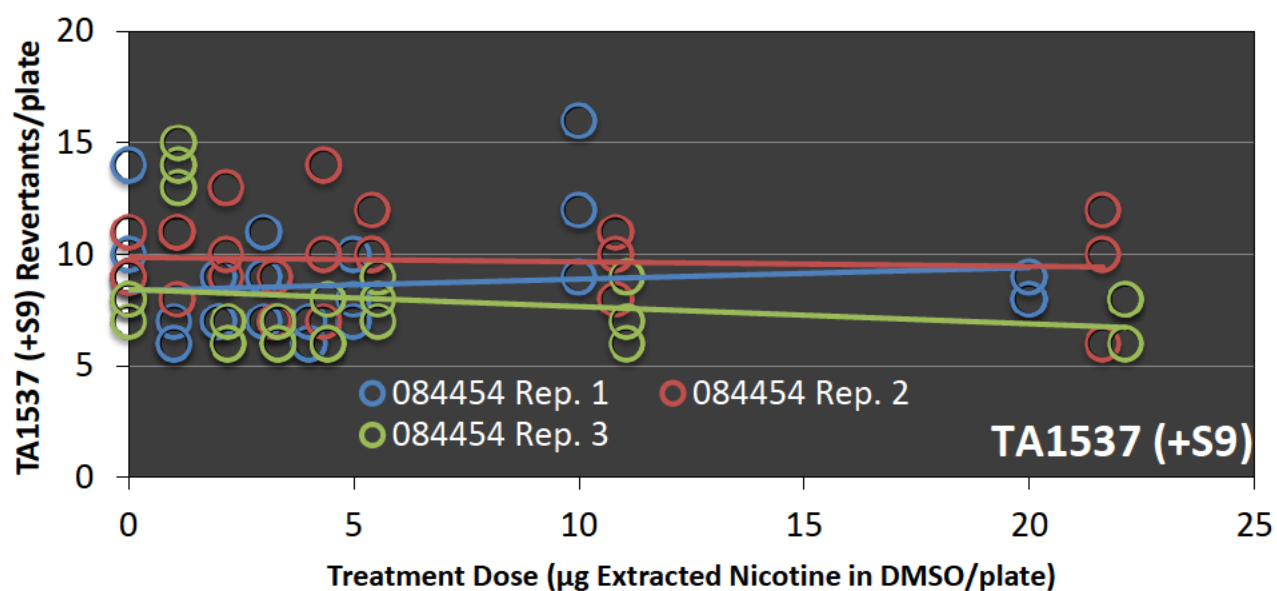
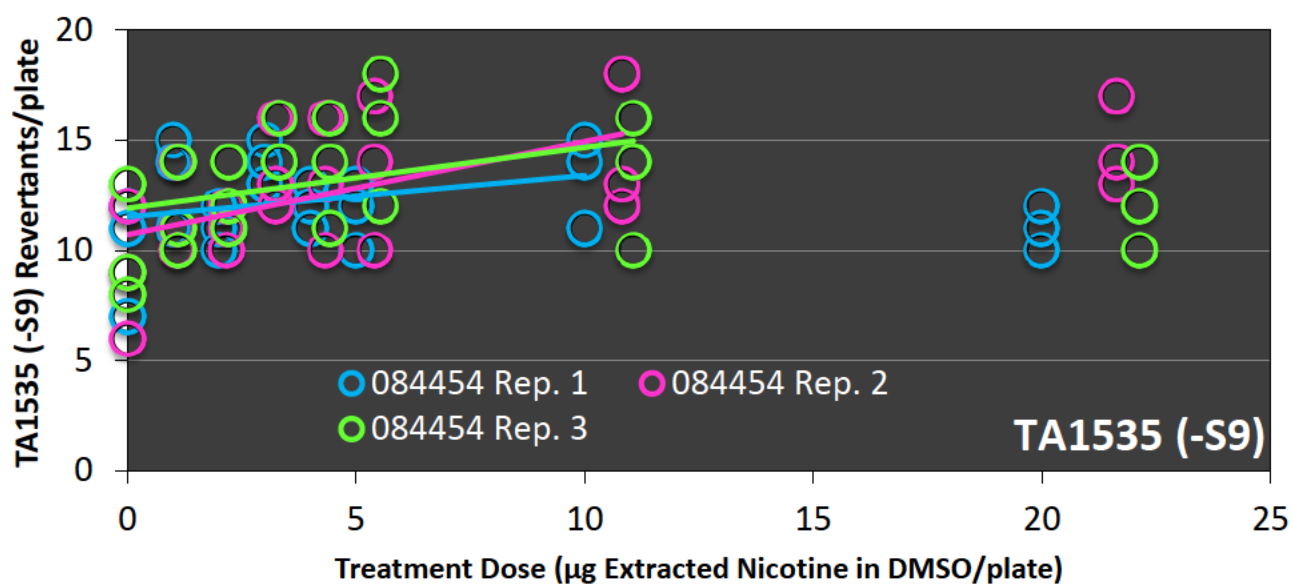
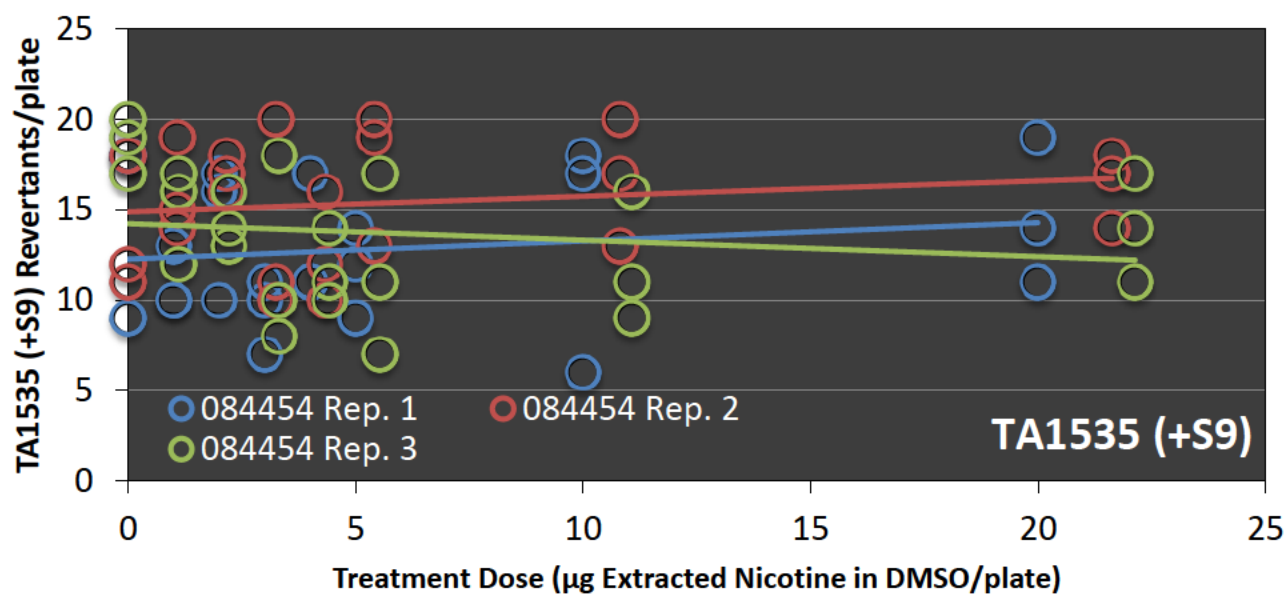


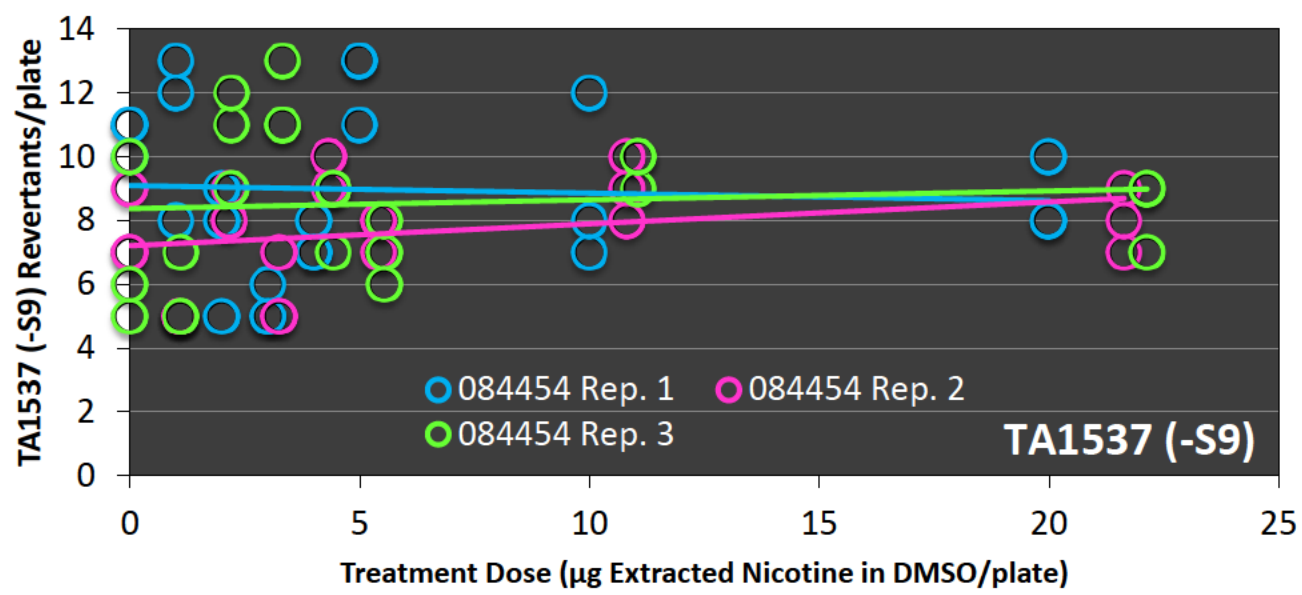


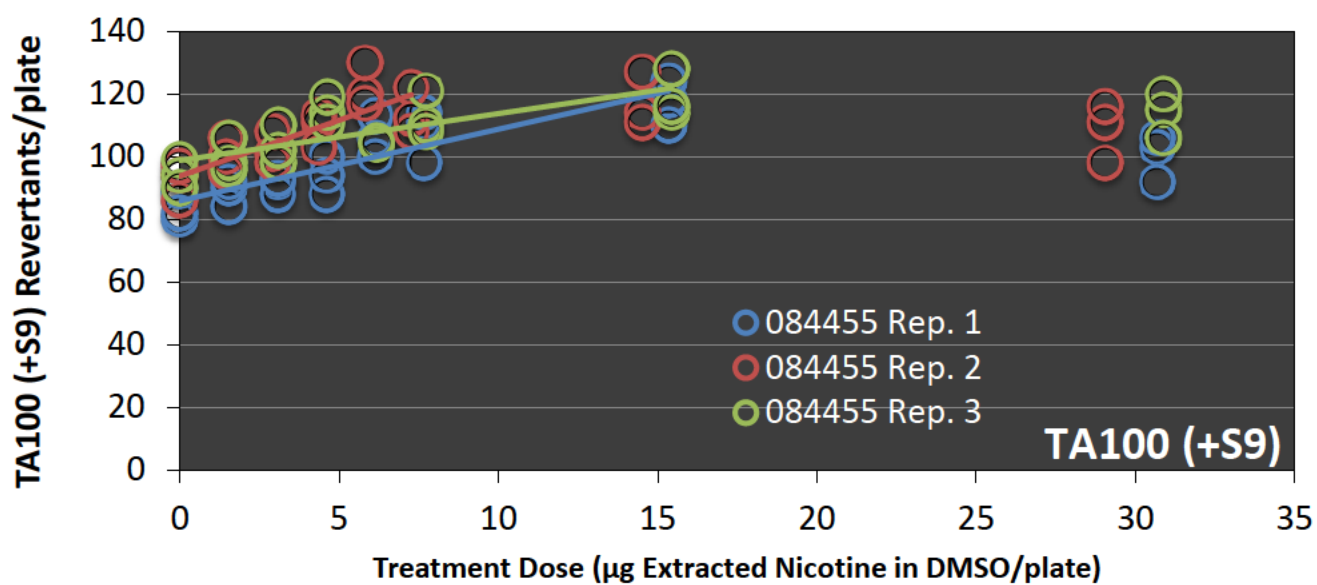
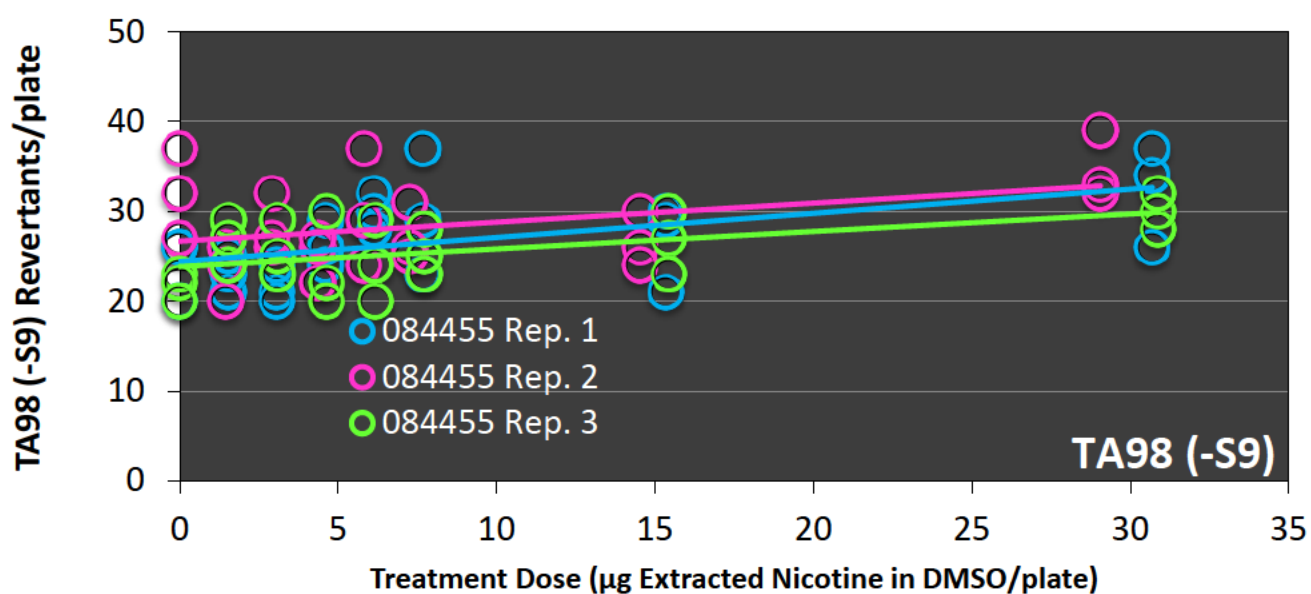
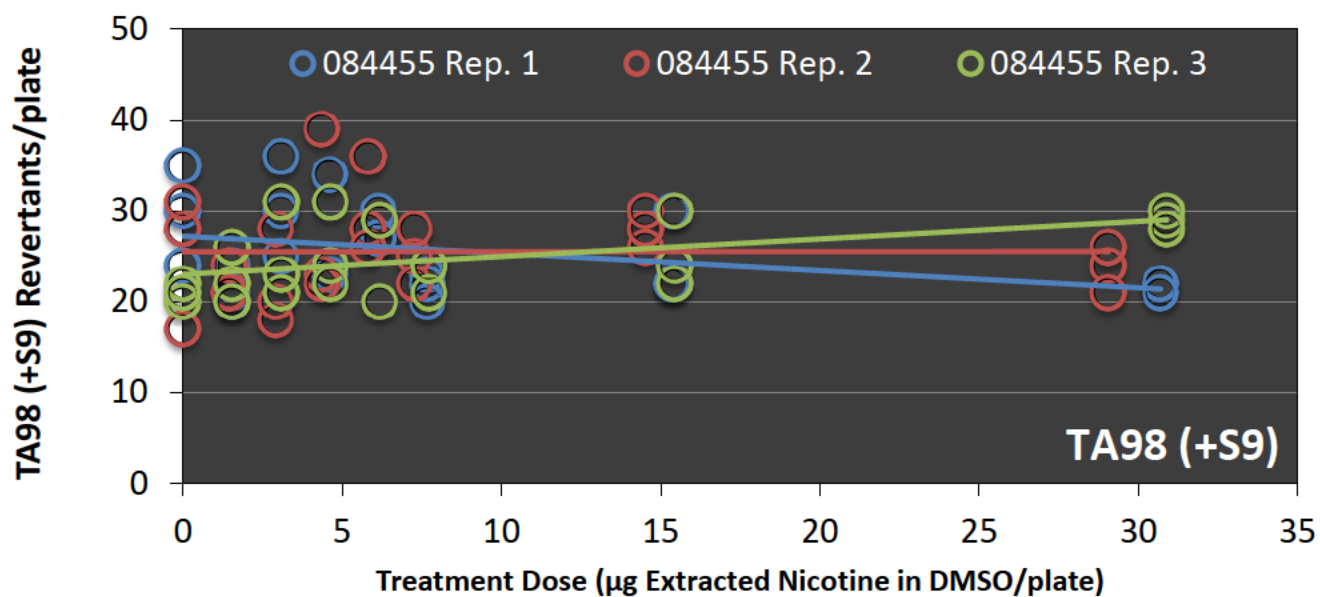


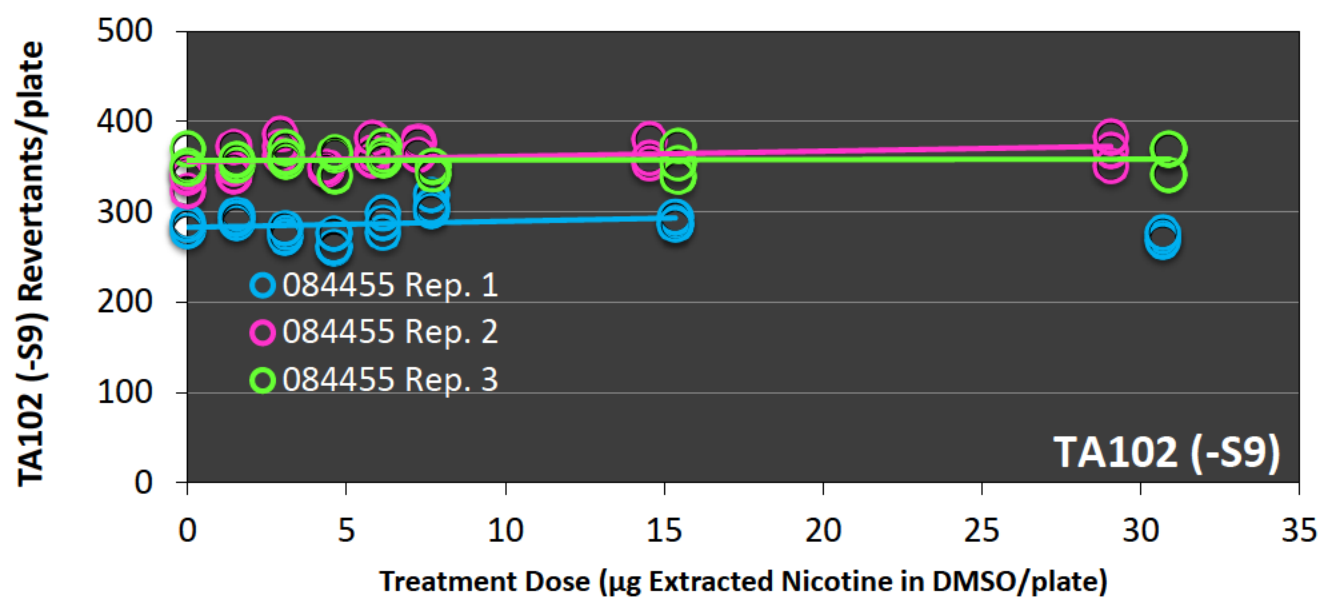
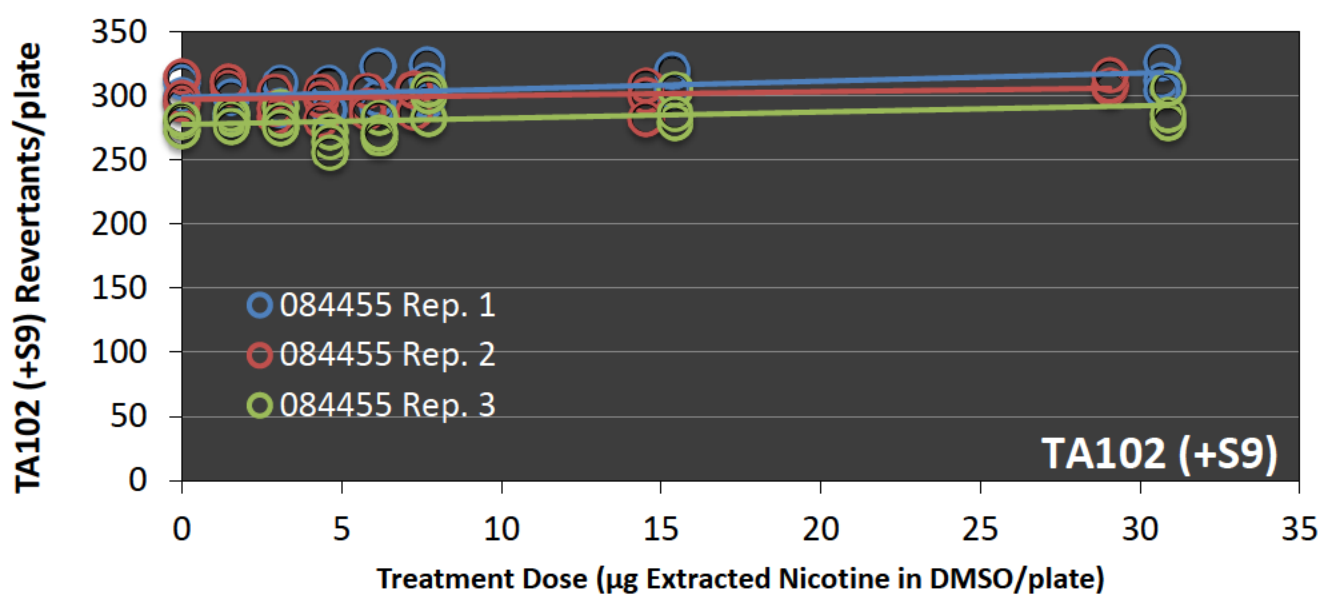
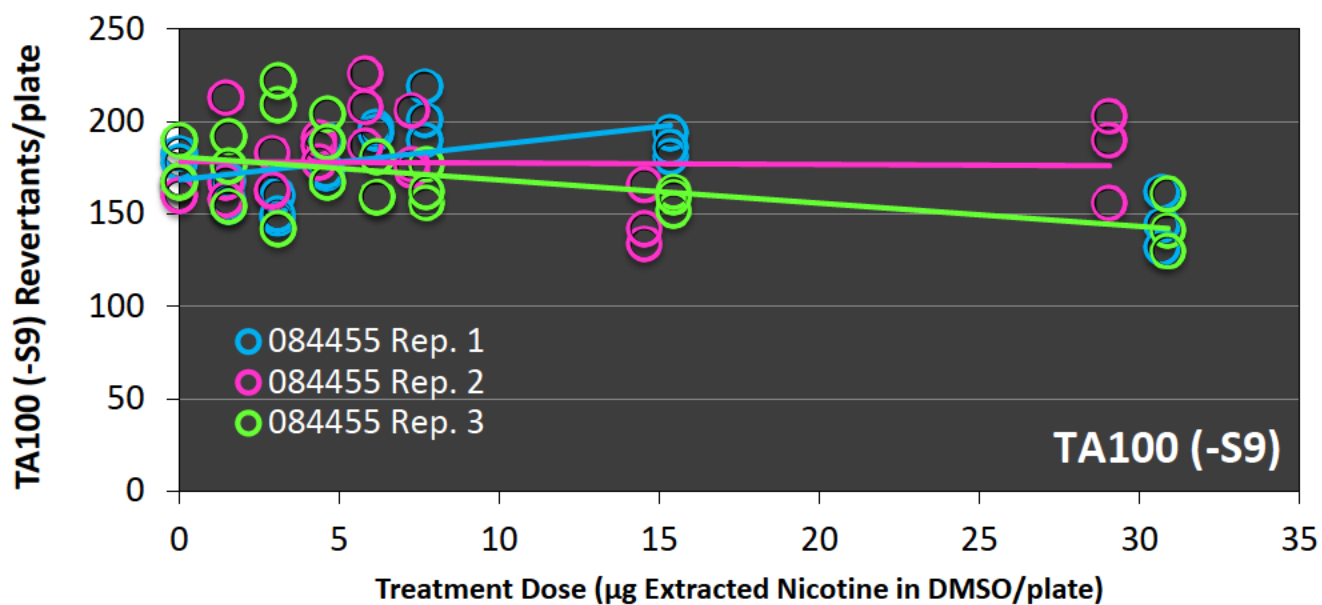


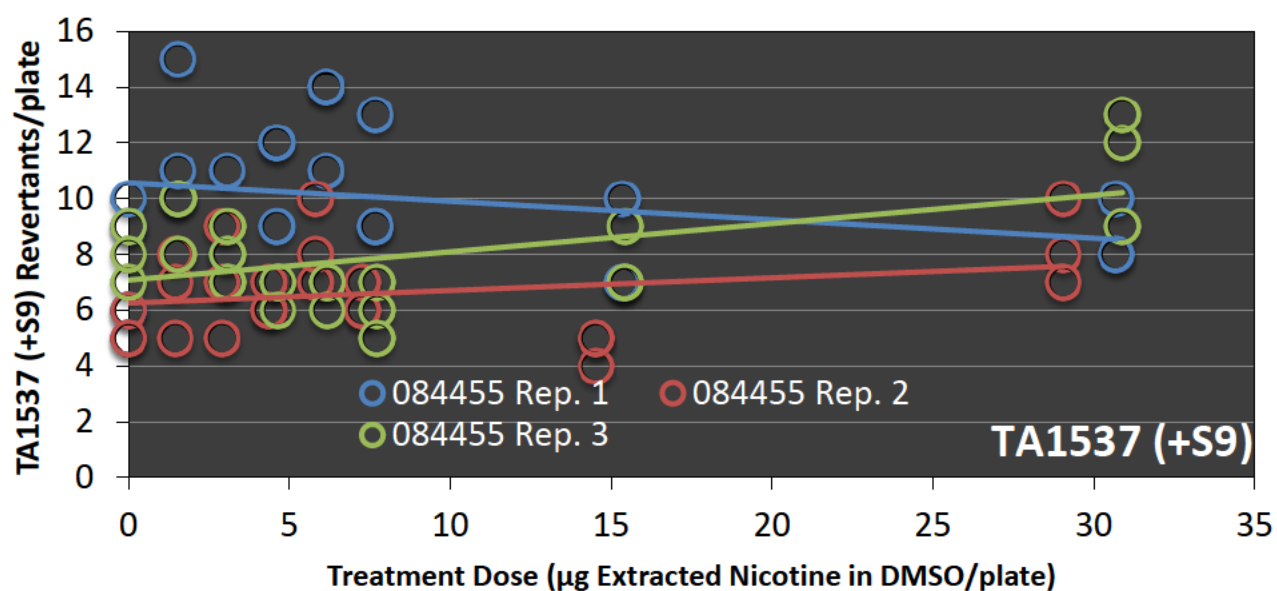
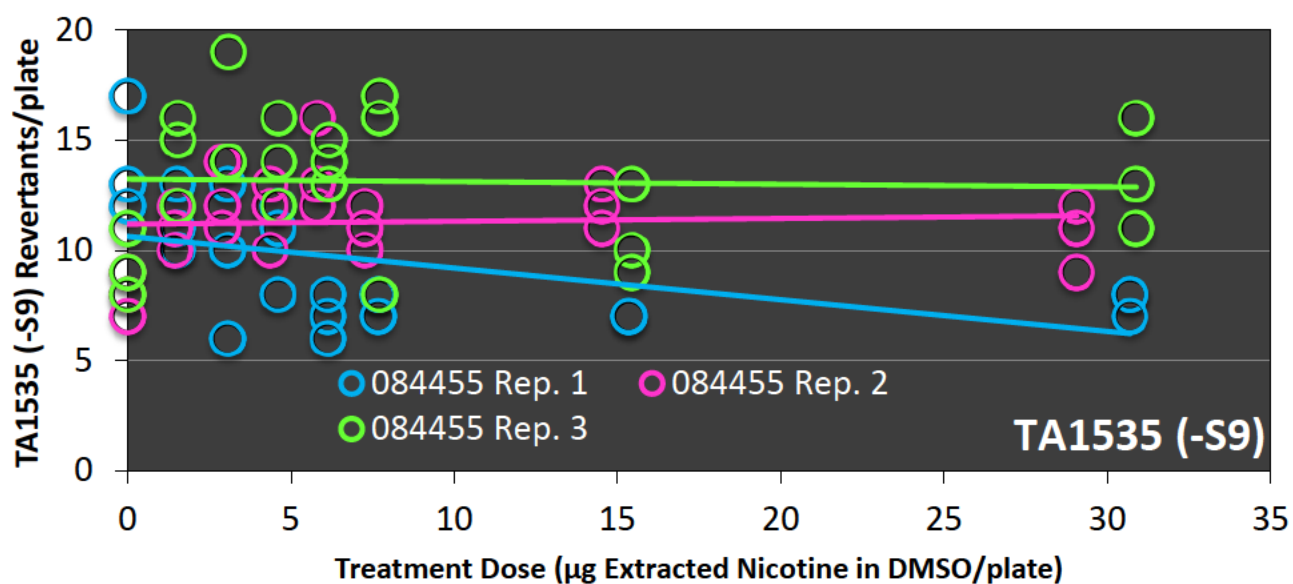
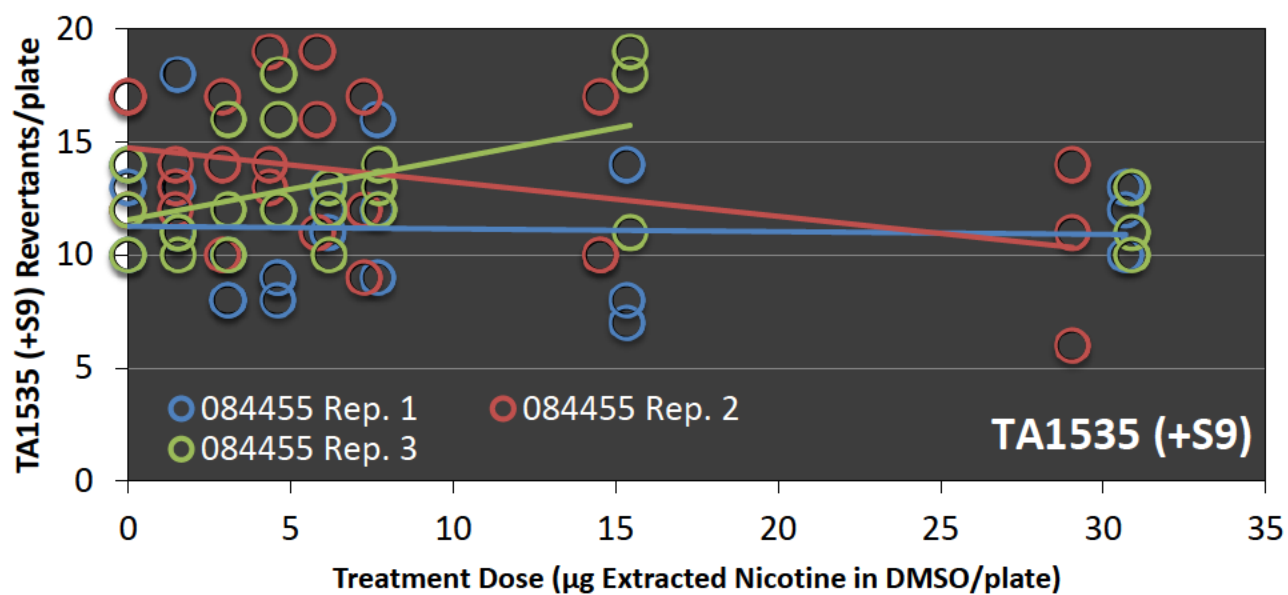


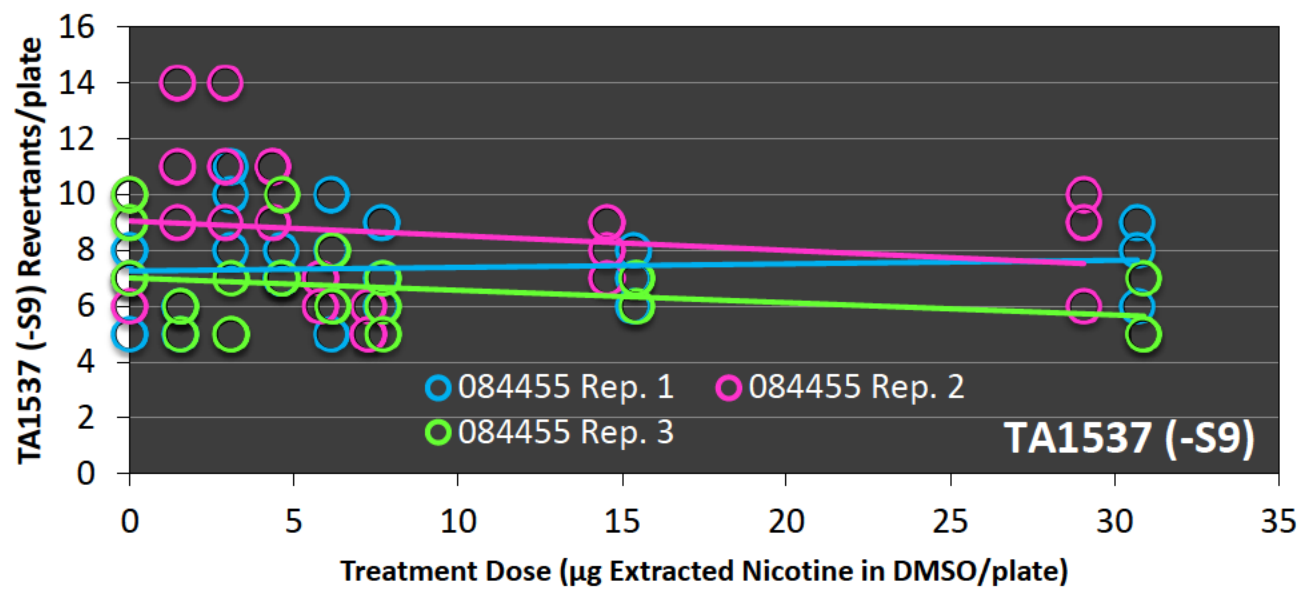


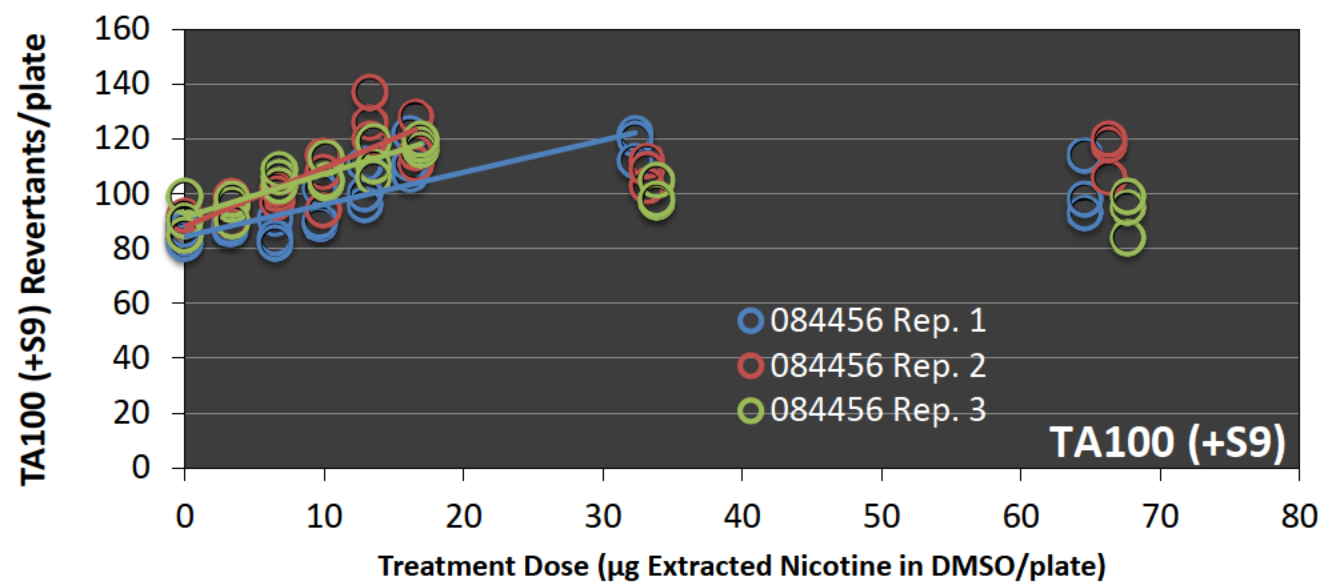
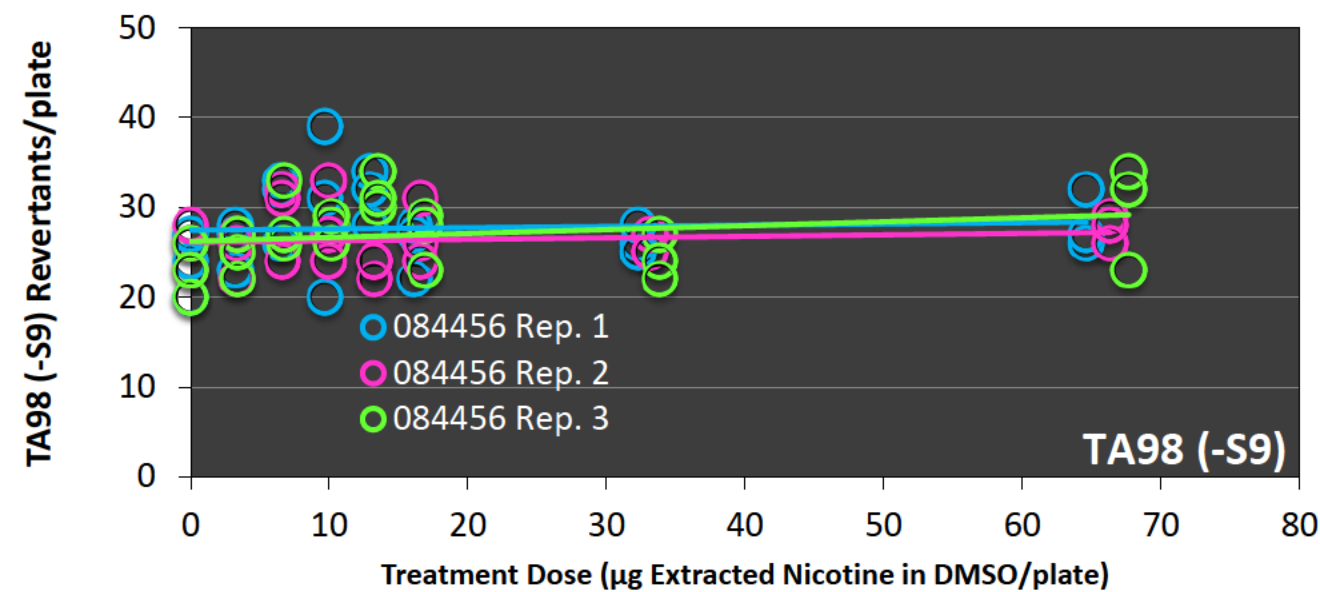
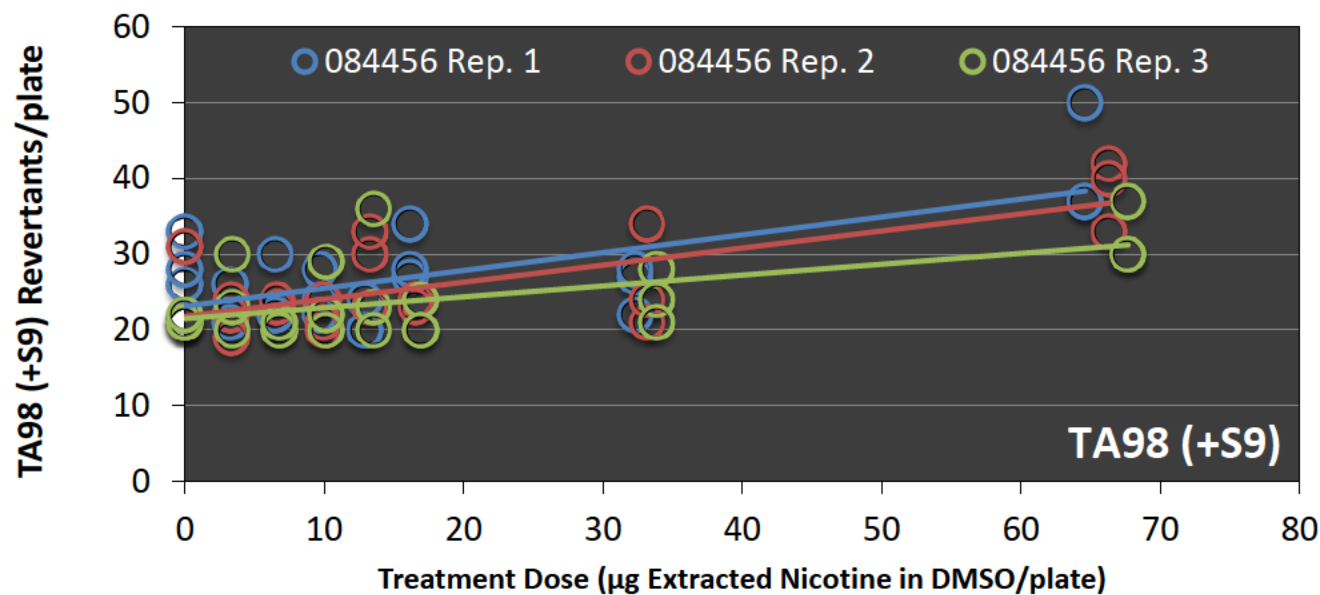


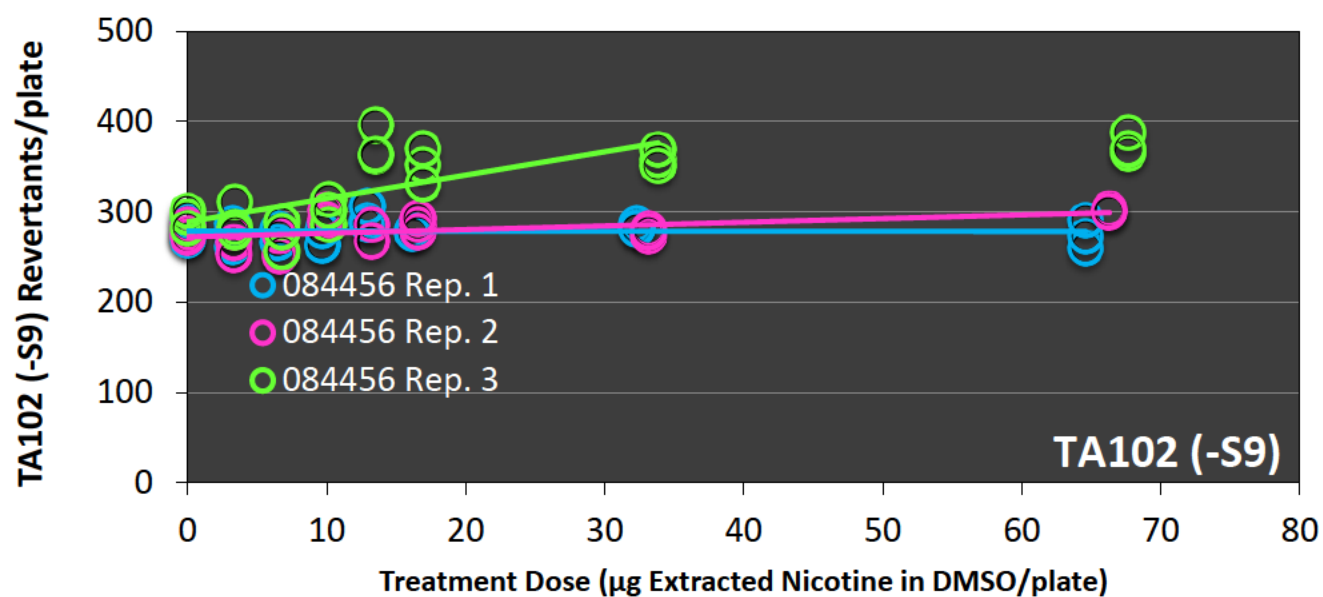
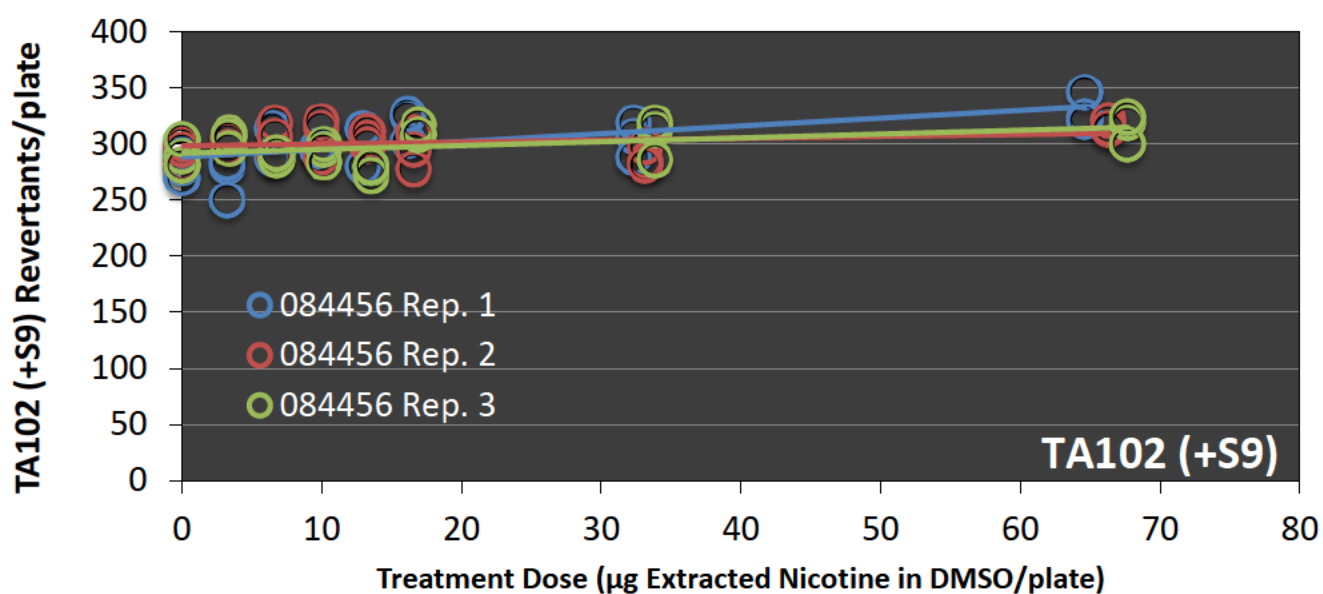
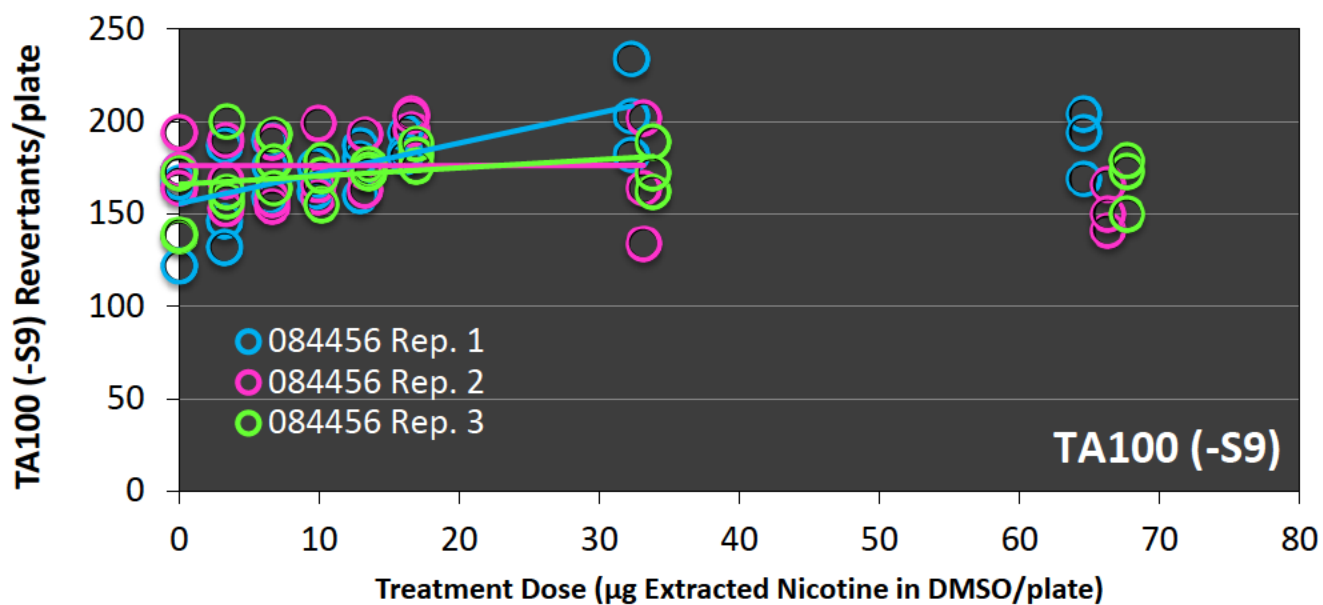


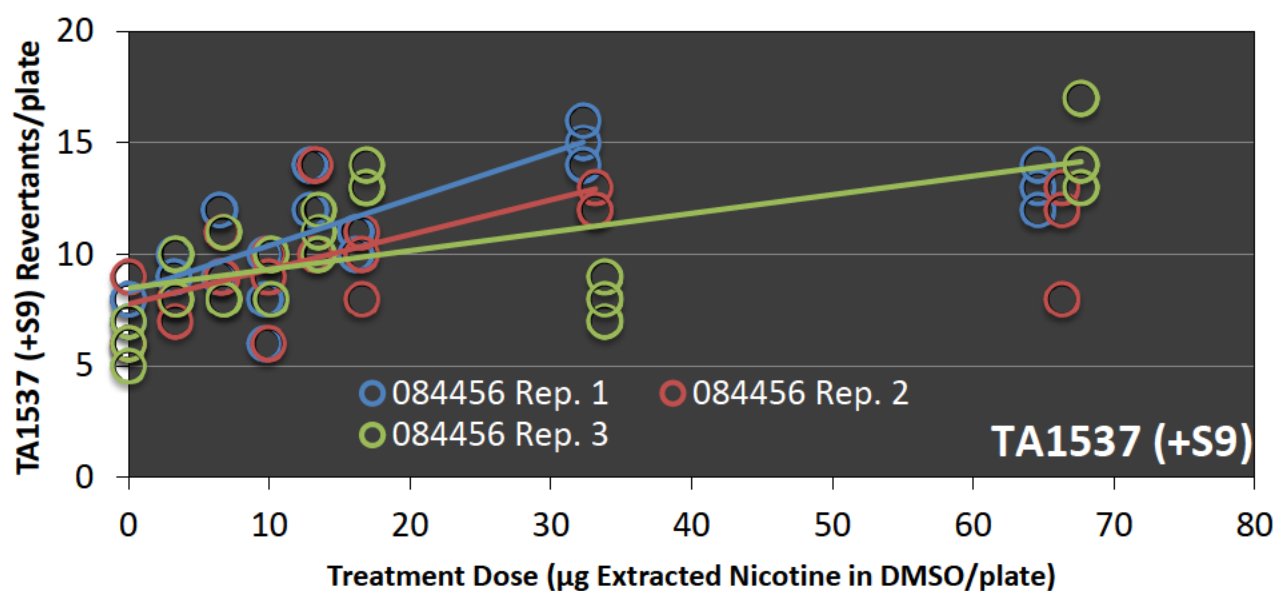
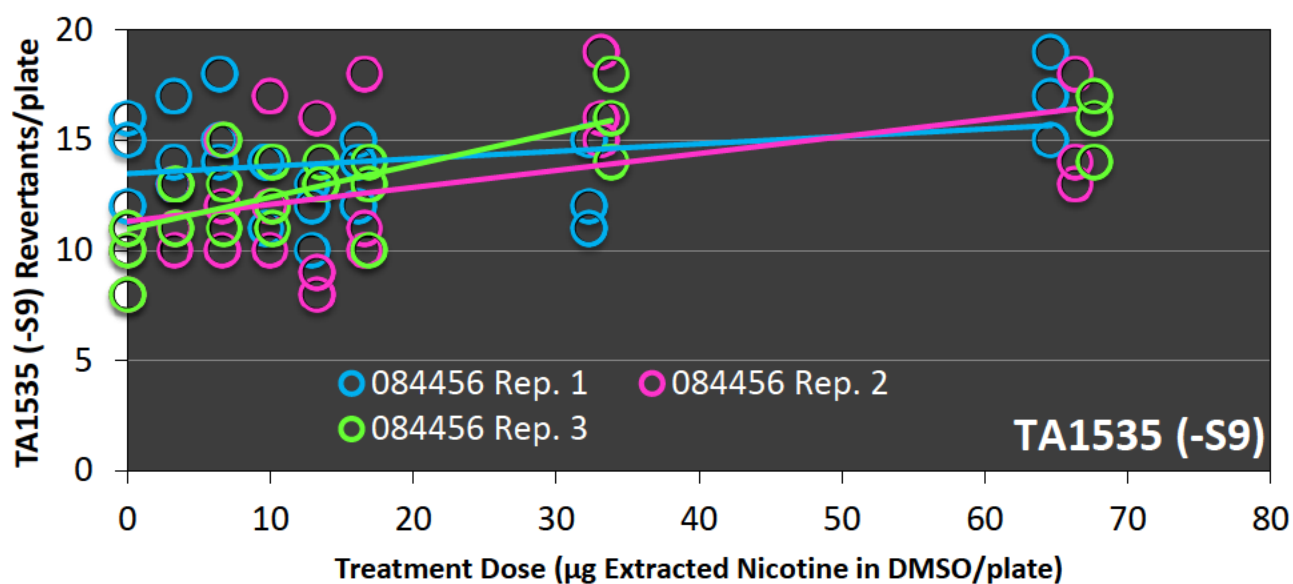
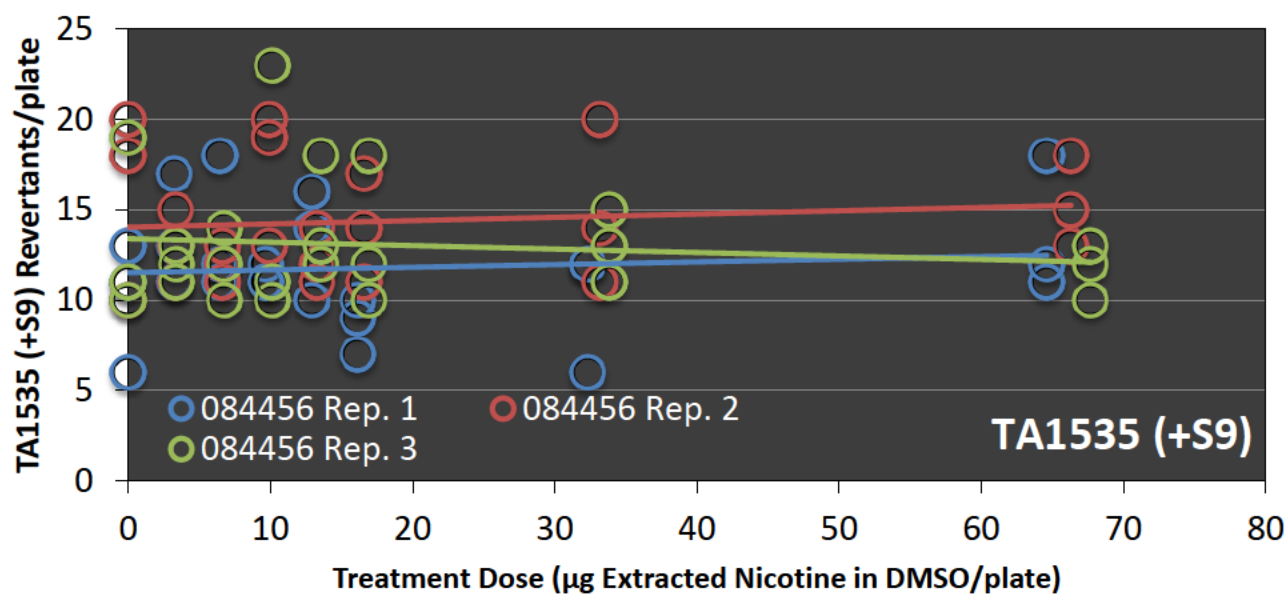


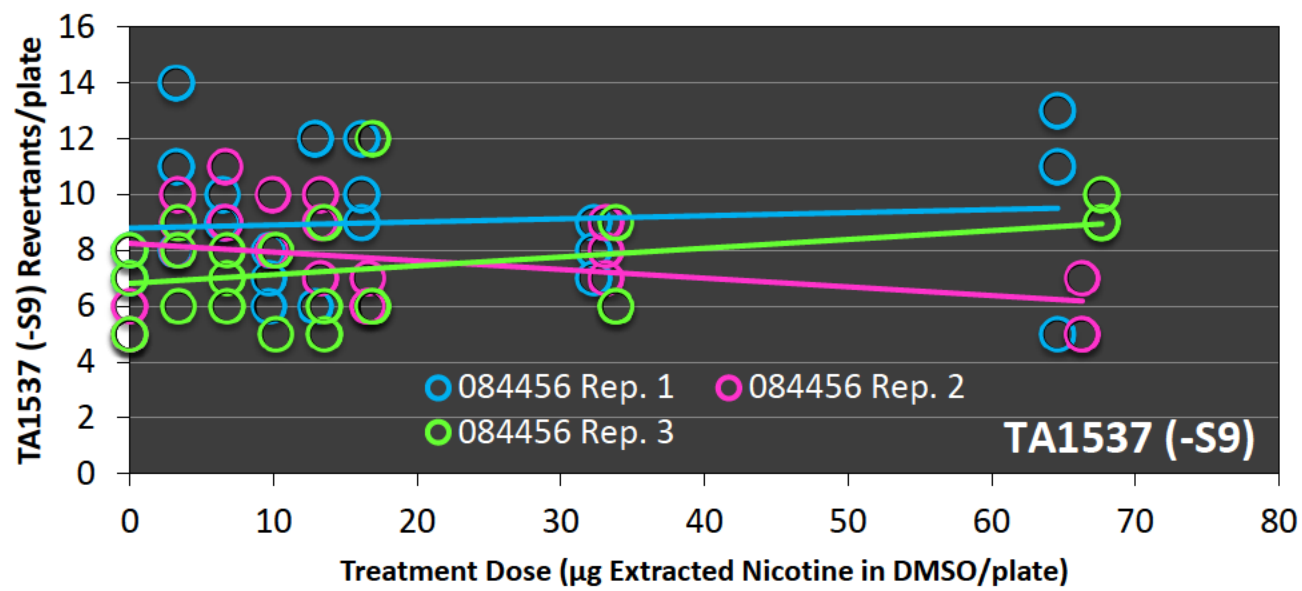


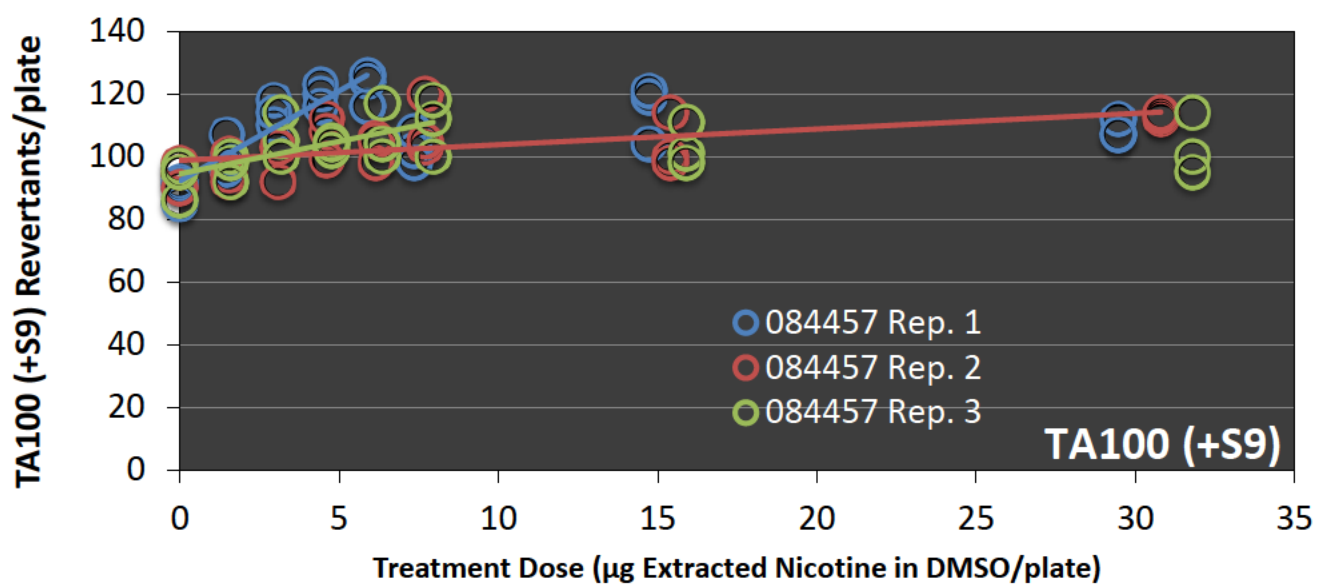
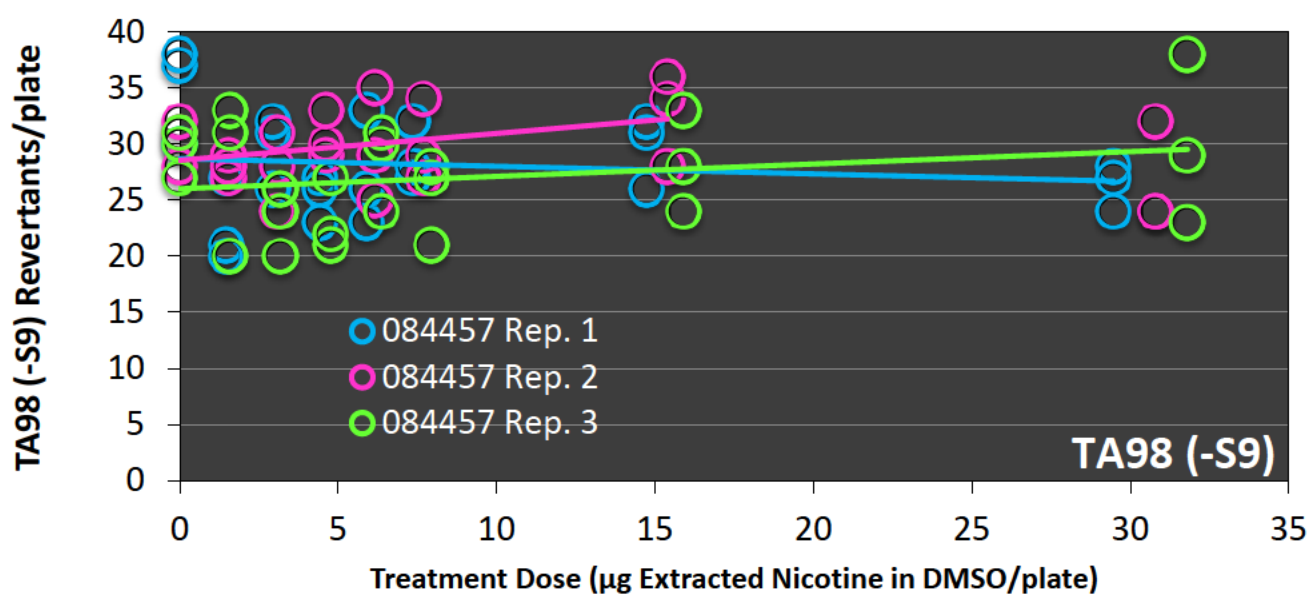
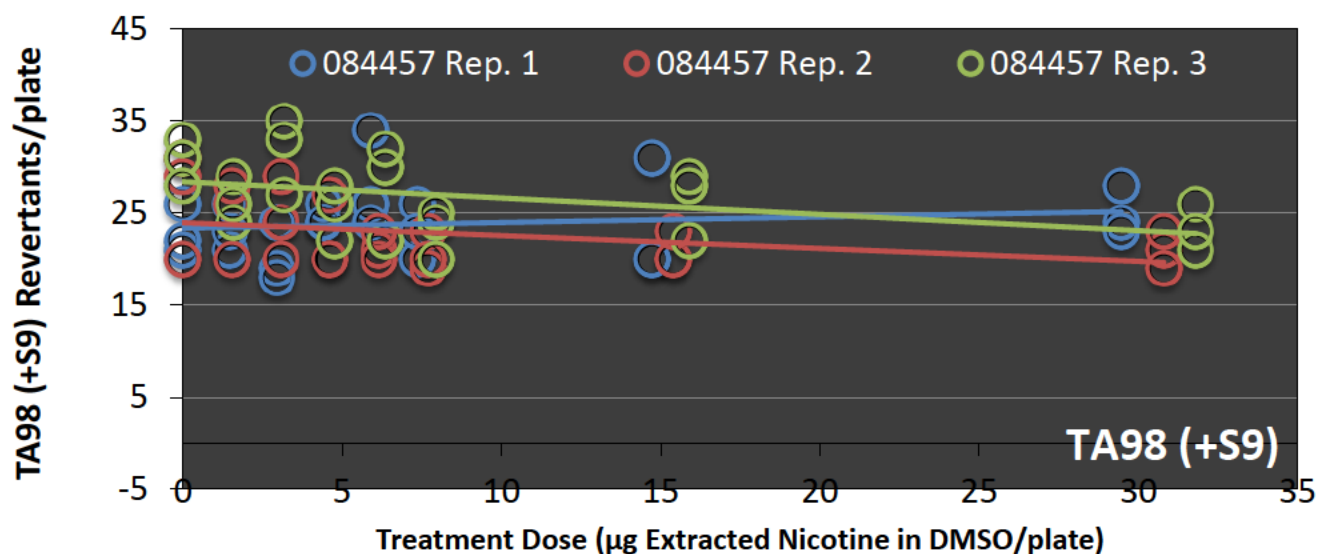


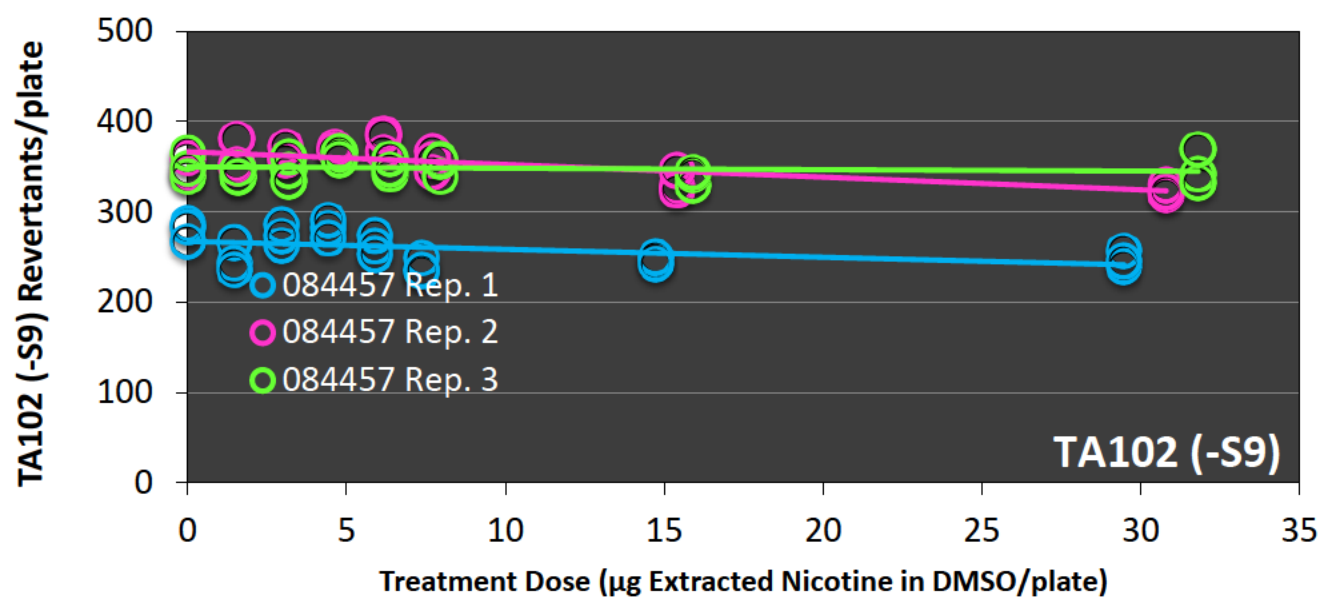
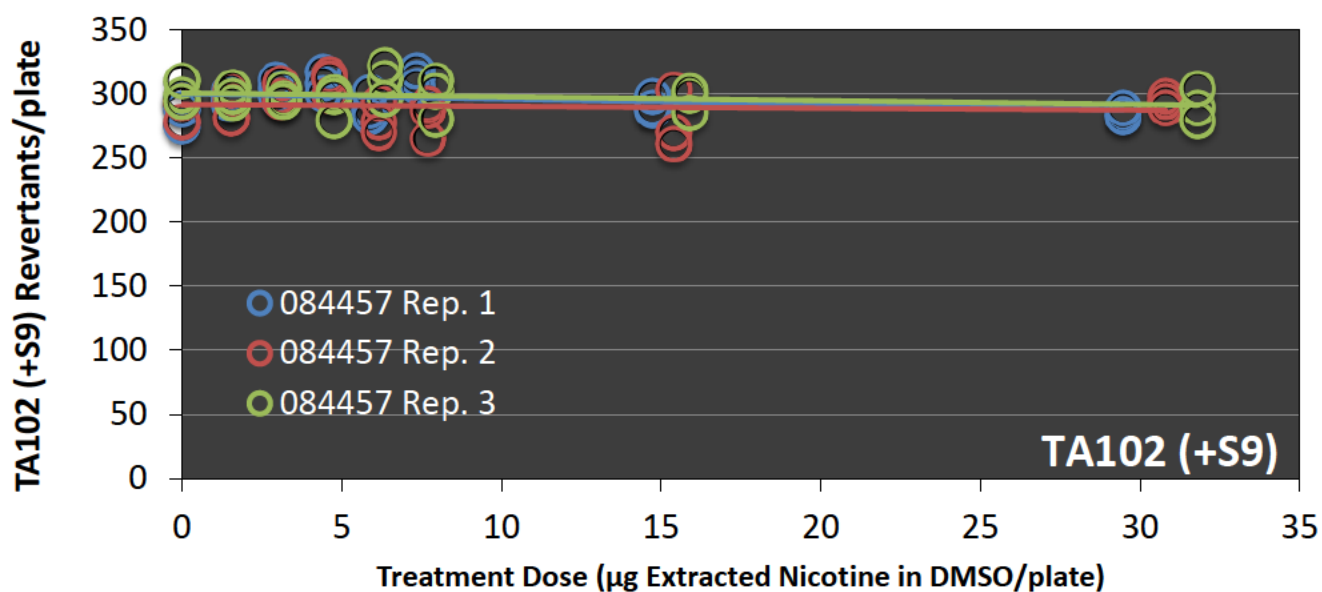
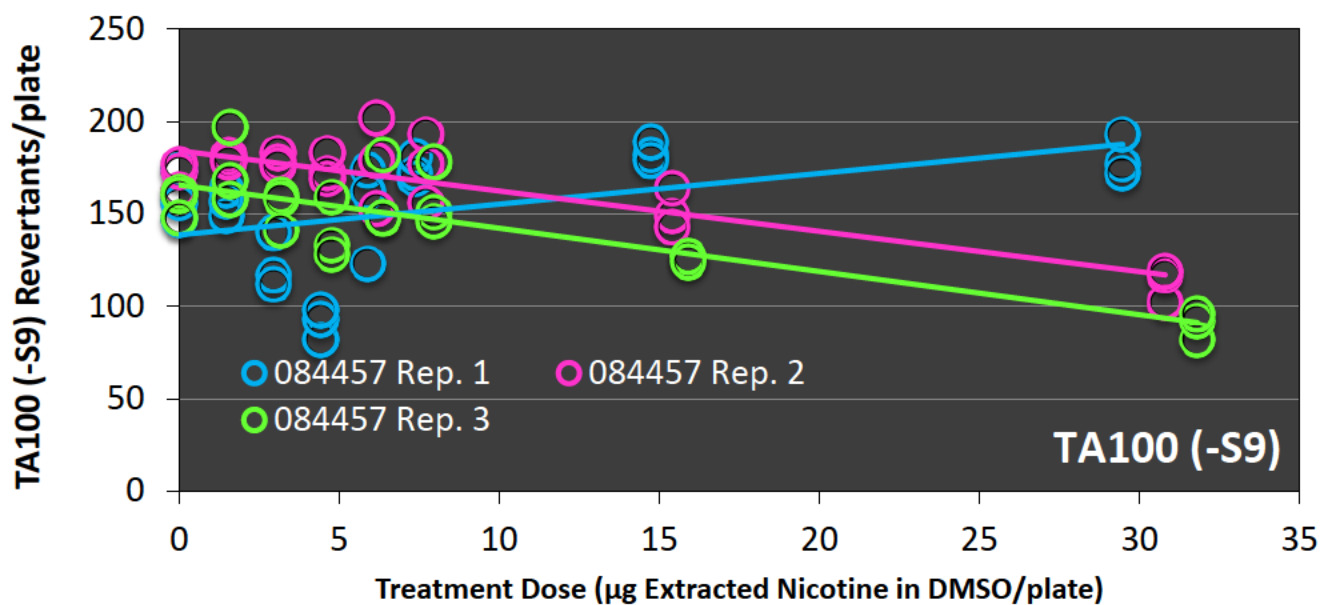


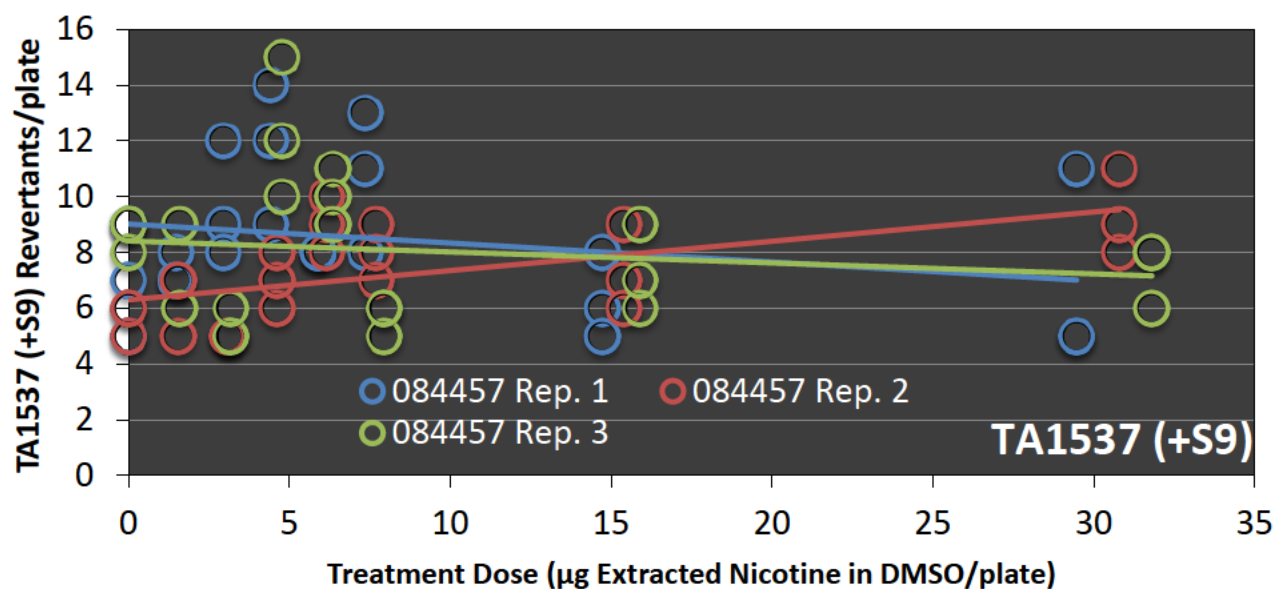
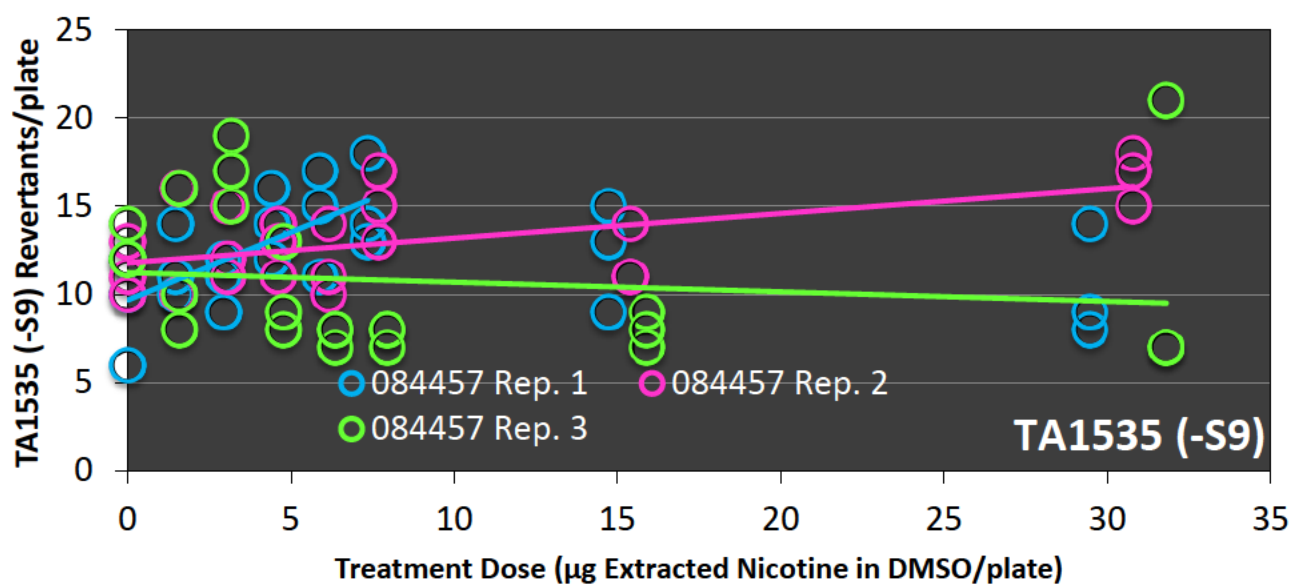
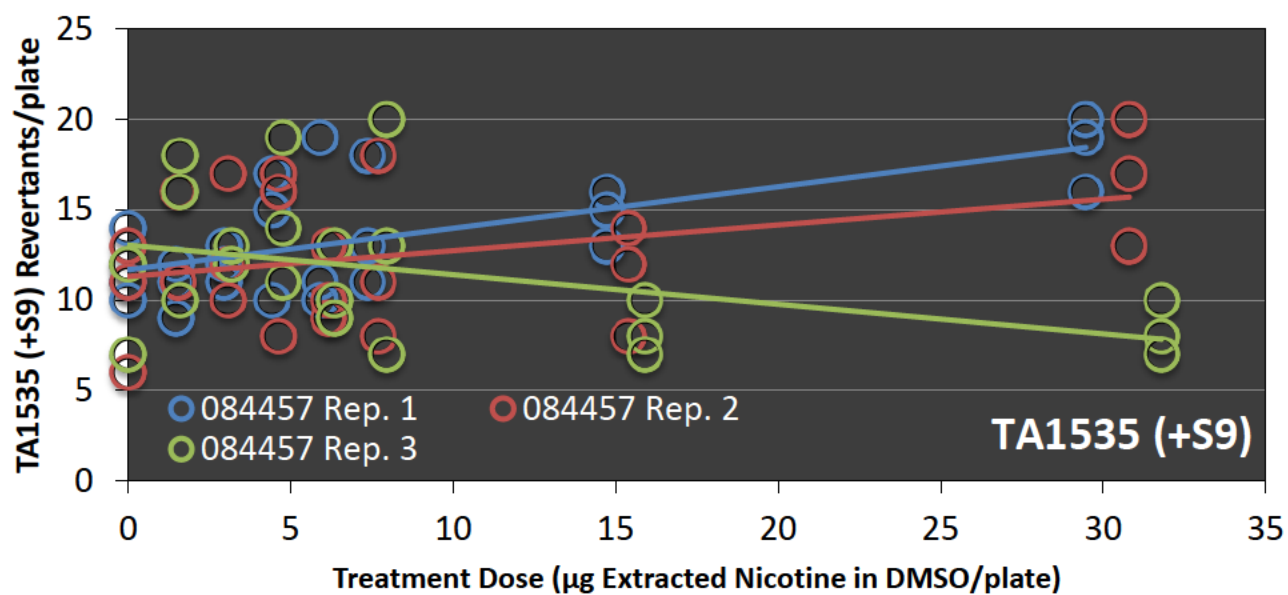


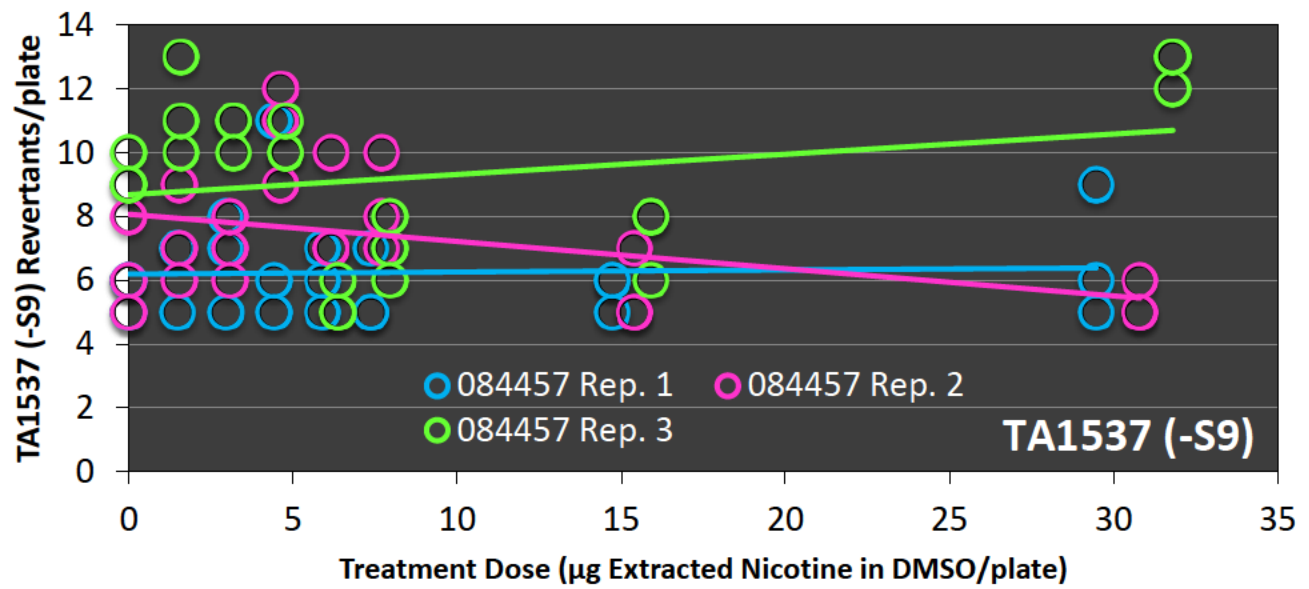


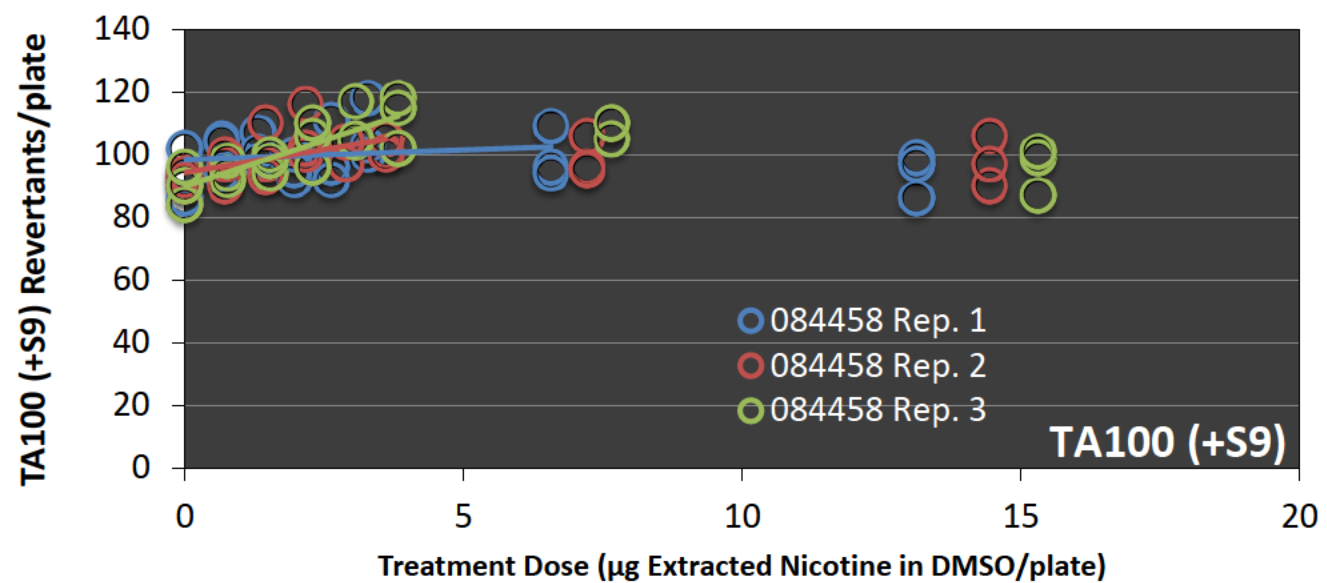
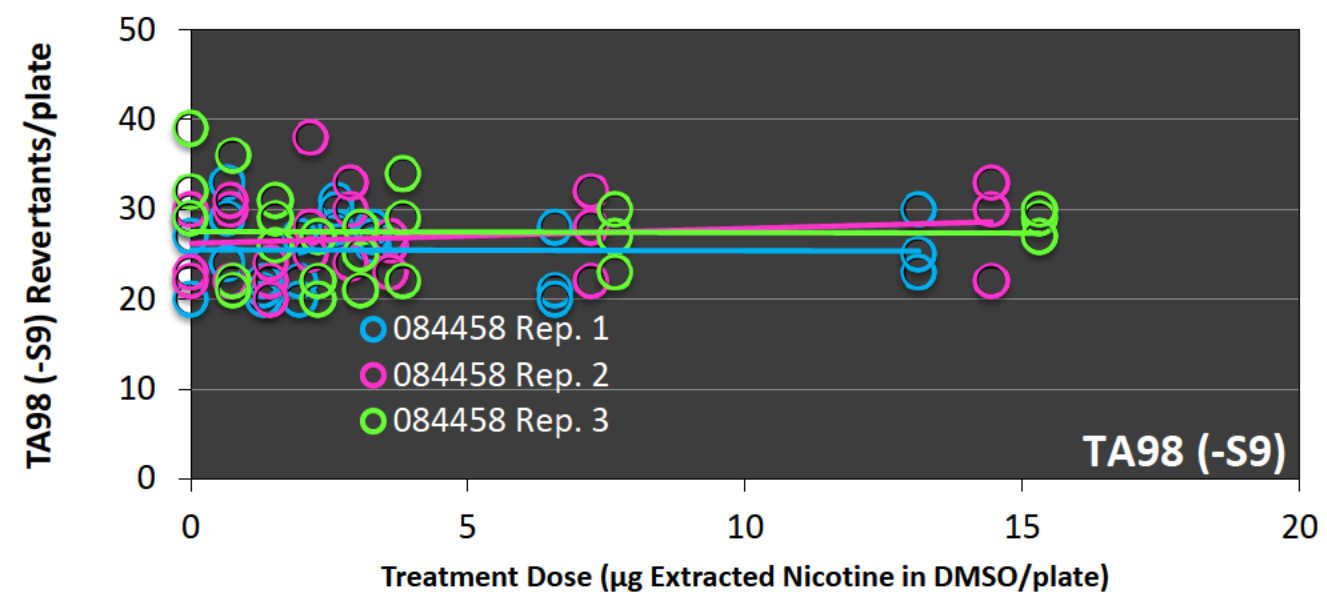
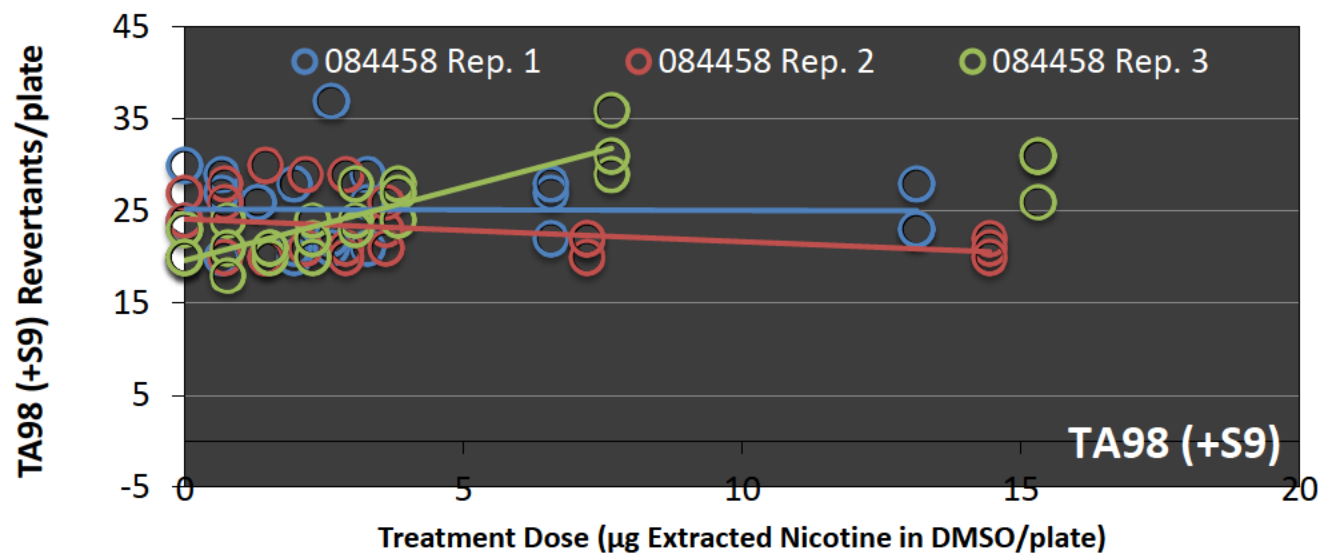


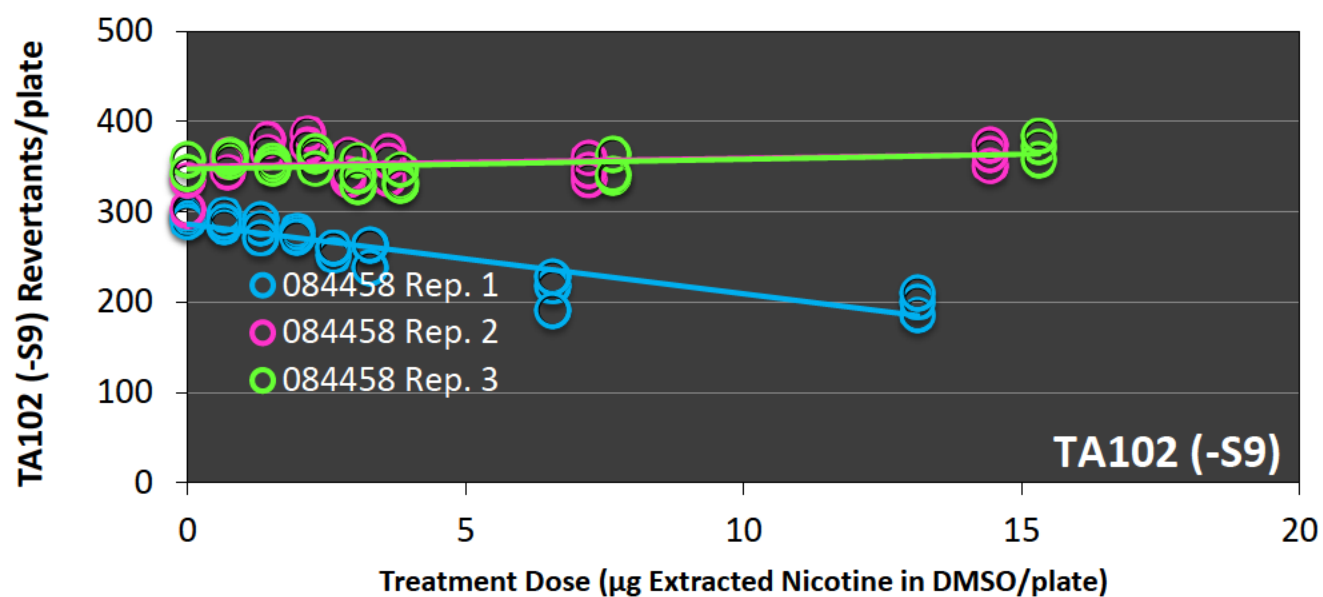
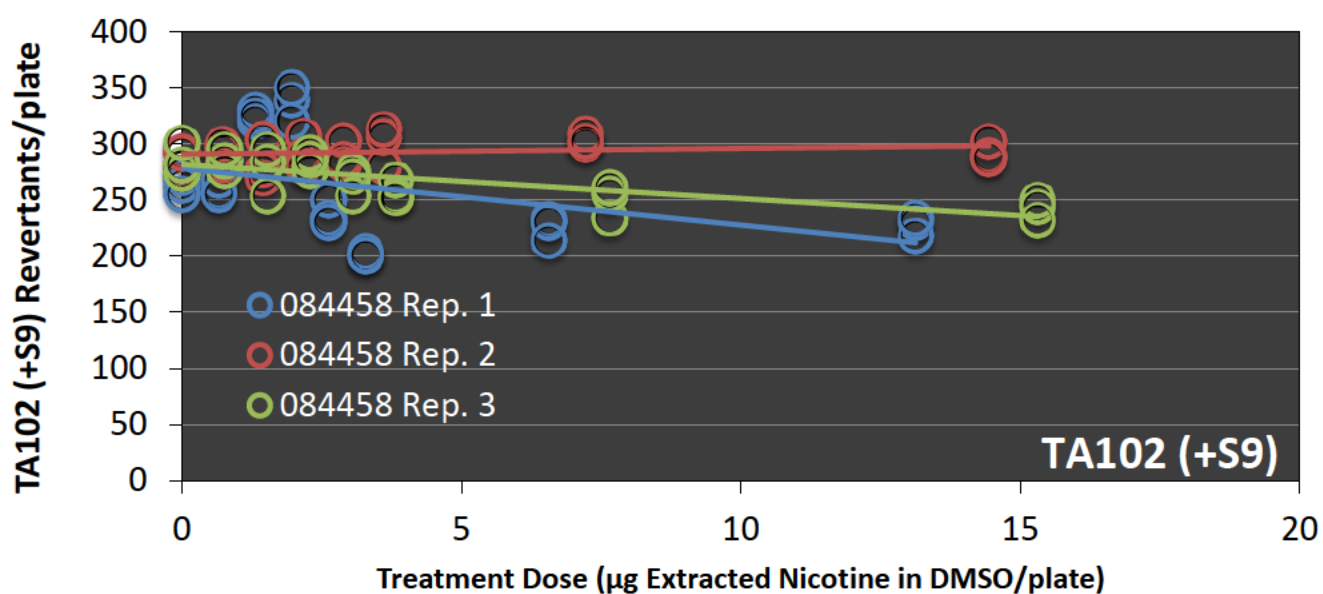
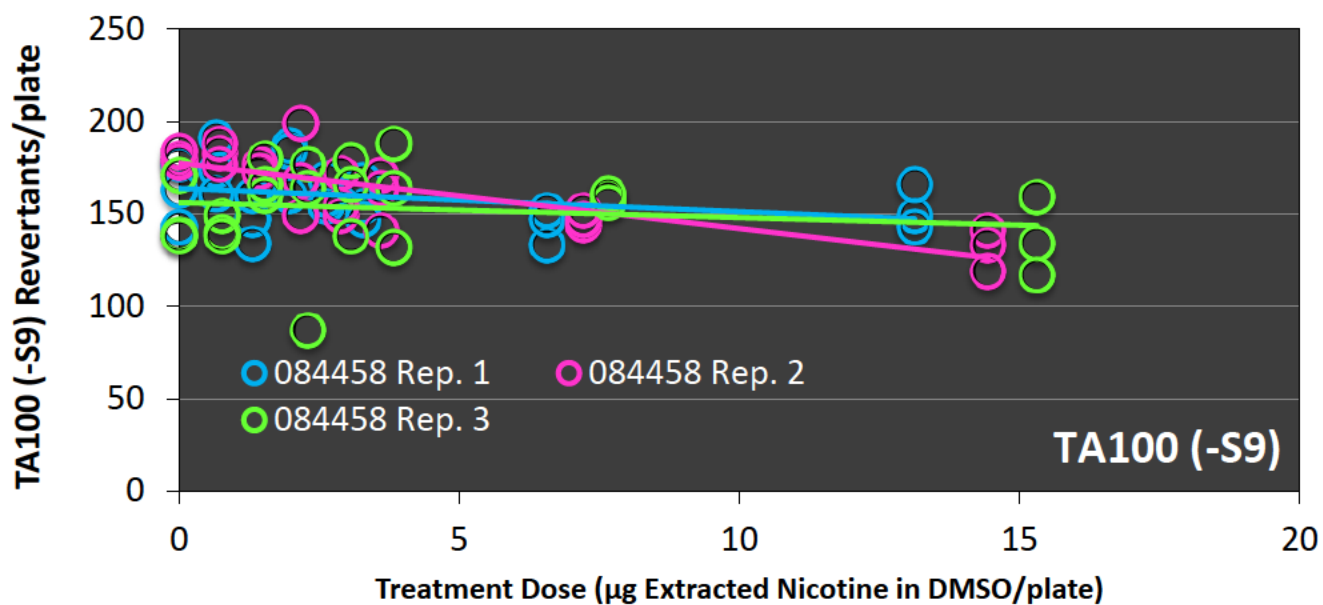


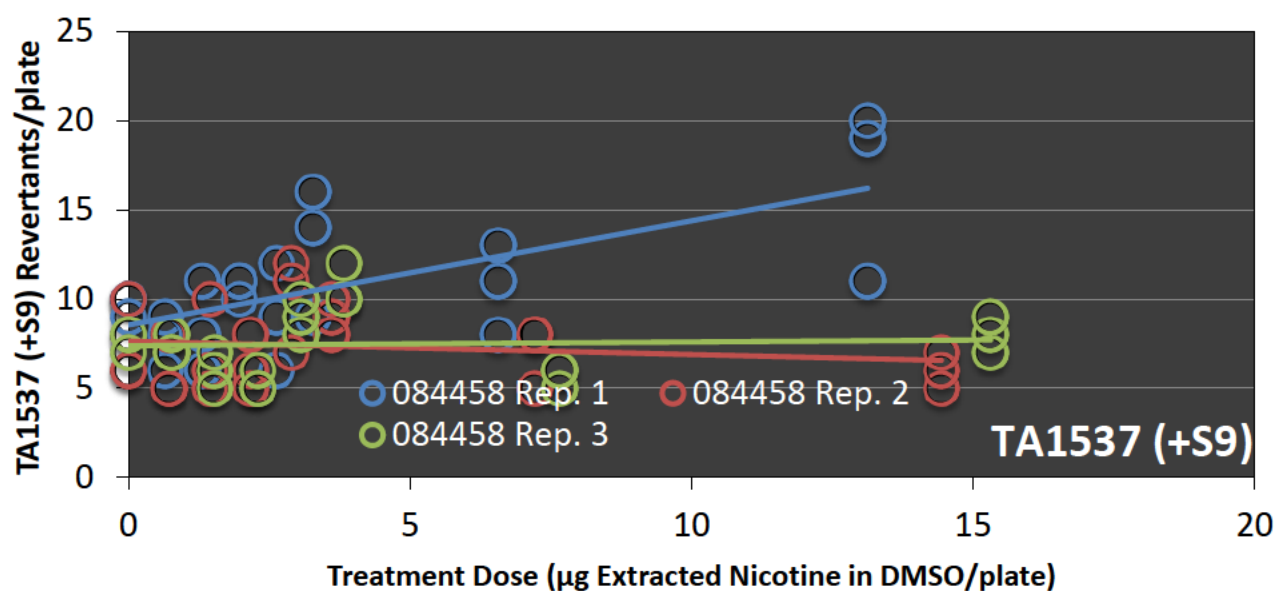
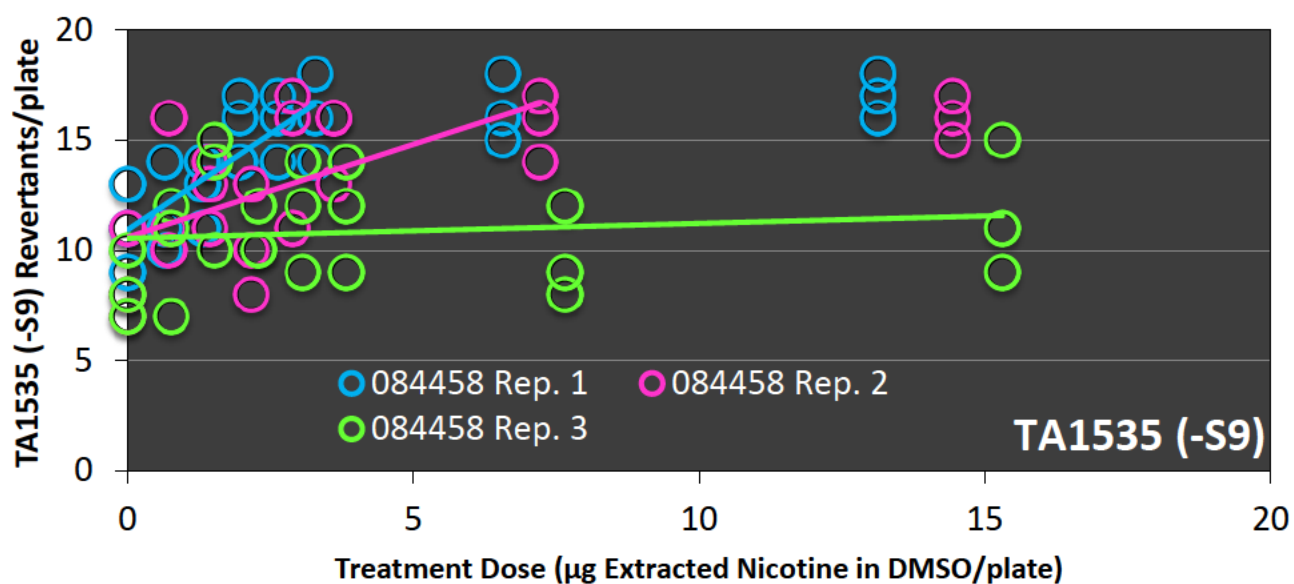
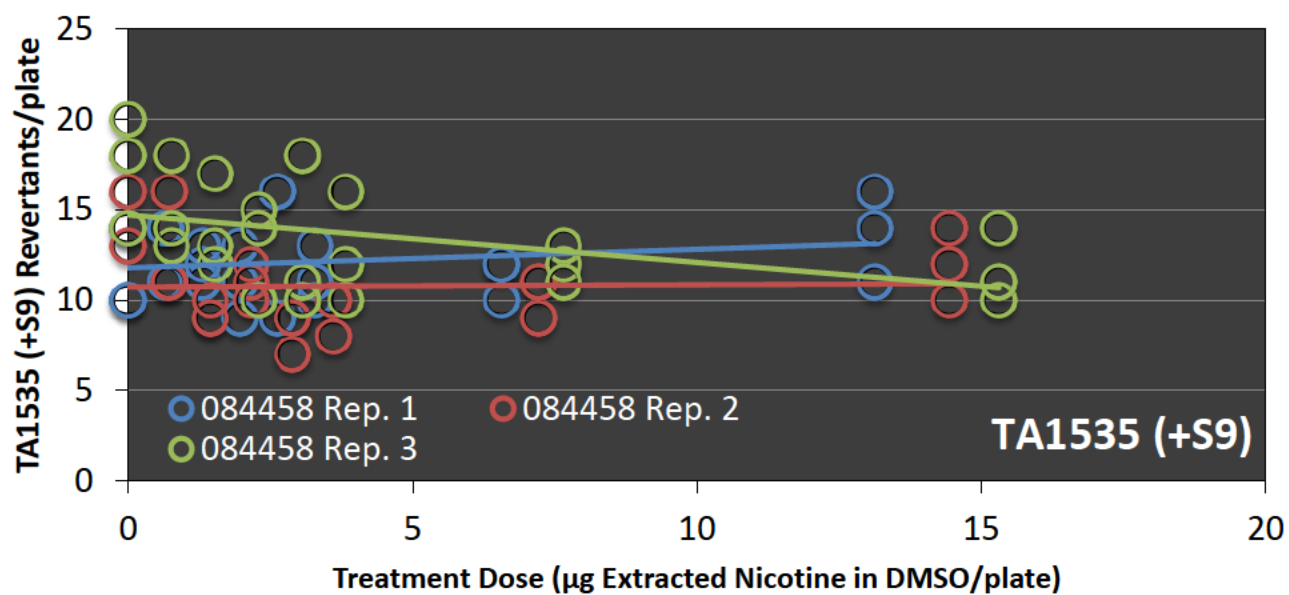


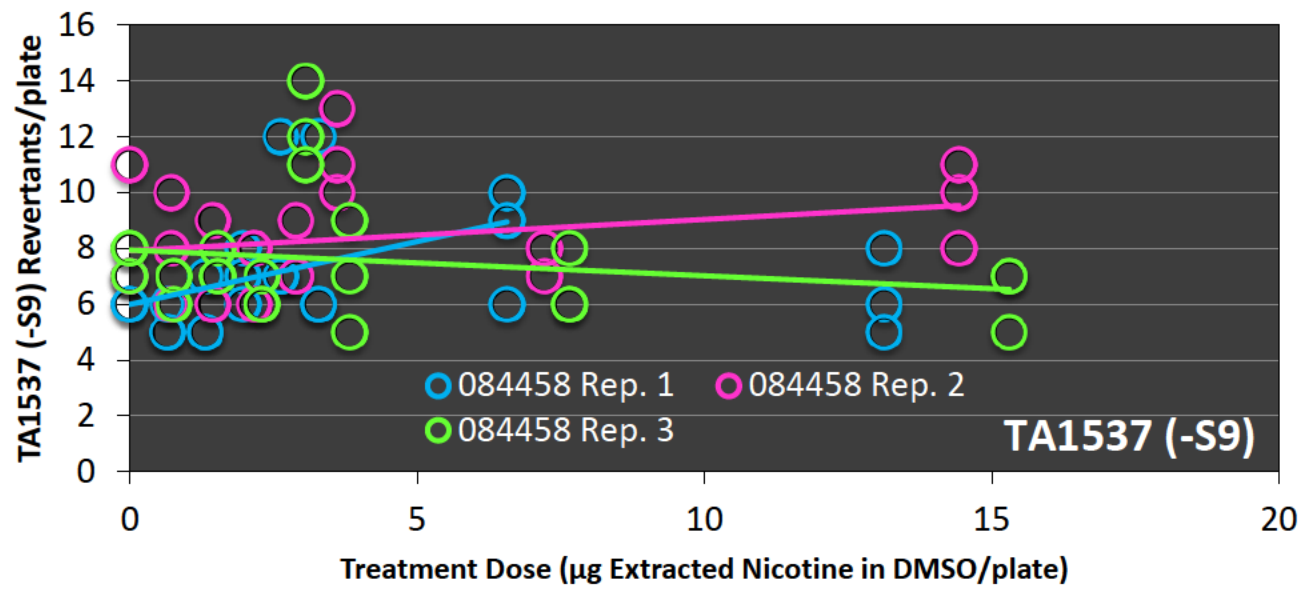












**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/mg 'Extracted Smokeless Tobacco in DMSO' (ST))**

Strain and S9 Activation	Sample ID	Sample Description	Number of Revertant Colonies/mg 'Extracted Smokeless Tobacco in DMSO'										
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'ST' Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard		t-test p-value (H ₀ : mean = 0)		
			(mg ST/plate)	slope	(mg ST/plate)	slope	(mg ST/plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA98 (+S9)	084394	Camel SNUS Frost	0 - 5.556	0.725	0 - 5.558	1.63	0 - 5.557	-1.45	0.303	0.915	0* - 4.24	0.772	not significant
TA98 (+S9)	084395	2S3	0 - 5.558	2.79	0 - 5.558	0.241	0 - 5.557	2.17	1.73	0.767	0* - 5.04	0.152	not significant
TA98 (+S9)	084454	Fresh Strips	0 - 5.558	-0.380	0 - 5.557	0.484	0 - 2.779	-2.47	0*	0.877	0* - 2.99	0.463	not significant
TA98 (+S9)	084455	Mellow Sticks	0 - 5.558	-1.04	0 - 5.559	0.010	0 - 5.556	1.07	0.014	0.612	0* - 2.65	0.984	not significant
TA98 (+S9)	084456	Copenhagen Long Cut	0 - 5.559	2.74	0 - 5.558	2.70	0 - 5.559	1.75	2.39	0.323	1 - 3.78	0.018	significant
TA98 (+S9)	084457	Ariva Wintergreen	0 - 5.556	0.325	0 - 5.556	-0.772	0 - 5.556	-1.01	0*	0.412	0* - 1.28	0.359	not significant
TA98 (+S9)	084458	Fresh Orbs	0 - 5.558	-0.034	0 - 5.557	-0.638	0 - 2.778	4.38	1.24	1.58	0* - 8.05	0.516	not significant
TA98 (-S9)	084394	Camel SNUS Frost	0 - 5.556	-0.275	0 - 5.558	1.09	0 - 2.778	0	0.272	0.417	0* - 2.07	0.581	not significant
TA98 (-S9)	084395	2S3	0 - 5.558	0.490	0 - 5.558	-0.574	0 - 2.779	-0.289	0*	0.318	0* - 1.24	0.733	not significant
TA98 (-S9)	084454	Fresh Strips	0 - 5.558	0.881	0 - 5.557	-0.080	0 - 5.558	0.915	0.572	0.326	0* - 1.98	0.222	not significant
TA98 (-S9)	084455	Mellow Sticks	0 - 5.558	1.49	0 - 5.559	1.11	0 - 5.556	1.09	1.23	0.131	0.664 - 1.79	0.011	significant
TA98 (-S9)	084456	Copenhagen Long Cut	0 - 5.559	0.160	0 - 5.558	0.198	0 - 5.559	0.534	0.297	0.119	0* - 0.808	0.129	not significant
TA98 (-S9)	084457	Ariva Wintergreen	0 - 5.556	-0.357	0 - 2.778	1.33	0 - 5.556	0.632	0.534	0.489	0* - 2.64	0.389	not significant
TA98 (-S9)	084458	Fresh Orbs	0 - 5.558	-0.027	0 - 5.557	0.429	0 - 5.556	-0.031	0.123	0.153	0* - 0.78	0.504	not significant
TA100 (+S9)	084394	Camel SNUS Frost	0 - 1.389	1.34	0 - 1.389	13.5	0 - 1.389	18.5	11.1	5.09	0* - 33	0.161	not significant
TA100 (+S9)	084395	2S3	0 - 1.112	12.4	0 - 1.112	28.4	0 - 1.111	11.4	17.4	5.52	0* - 41.2	0.088	not significant
TA100 (+S9)	084454	Fresh Strips	0 - 1.389	18.9	0 - 2.779	10.8	0 - 1.389	13.2	14.3	2.40	3.96 - 24.6	0.027	significant
TA100 (+S9)	084455	Mellow Sticks	0 - 2.779	12.6	0 - 1.39	18.6	0 - 2.778	8.29	13.2	2.99	0.298 - 26	0.048	significant
TA100 (+S9)	084456	Copenhagen Long Cut	0 - 2.779	13.6	0 - 1.39	25.6	0 - 1.39	19.1	19.4	3.45	4.56 - 34.3	0.030	significant
TA100 (+S9)	084457	Ariva Wintergreen	0 - 1.111	30.4	0 - 5.556	2.76	0 - 1.389	11.8	15.0	8.12	0* - 49.9	0.206	not significant
TA100 (+S9)	084458	Fresh Orbs	0 - 2.779	1.48	0 - 1.389	7.61	0 - 1.389	16.1	8.41	4.25	0* - 26.7	0.186	not significant
TA100 (-S9)	084394	Camel SNUS Frost	0 - 5.556	2.41	0 - 5.558	4.56	0 - 5.557	6.62	4.53	1.21	0* - 9.76	0.065	not significant
TA100 (-S9)	084395	2S3	0 - 2.779	4.07	0 - 5.558	4.29	0 - 5.557	5.52	4.63	0.453	2.68 - 6.58	0.009	significant
TA100 (-S9)	084454	Fresh Strips	0 - 5.558	-4.00	0 - 5.557	1.13	0 - 2.779	2.67	0*	2.02	0* - 8.61	0.977	not significant
TA100 (-S9)	084455	Mellow Sticks	0 - 2.779	10.6	0 - 5.559	-0.418	0 - 5.556	-6.98	1.06	5.12	0* - 23.1	0.855	not significant
TA100 (-S9)	084456	Copenhagen Long Cut	0 - 2.779	19.0	0 - 2.779	0.031	0 - 2.78	5.45	8.16	5.64	0* - 32.4	0.285	not significant
TA100 (-S9)	084457	Ariva Wintergreen	0 - 5.556	8.82	0 - 5.556	-12.1	0 - 5.556	-13.4	0*	7.20	0* - 25.4	0.521	not significant
TA100 (-S9)	084458	Fresh Orbs	0 - 5.558	-2.95	0 - 5.557	-9.19	0 - 5.556	-2.24	0*	2.21	0* - 4.7	0.162	not significant
TA102 (+S9)	084394	Camel SNUS Frost	0 - 1.111	41.8	0 - 1.389	57.1	0 - 1.389	41.6	46.8	5.13	24.8 - 68.9	0.012	significant
TA102 (+S9)	084395	2S3	0 - 1.112	47.0	0 - 5.558	4.38	0 - 1.389	16.5	22.6	12.7	0* - 77.2	0.217	not significant
TA102 (+S9)	084454	Fresh Strips	0 - 5.558	1.11	0 - 5.557	-3.37	0 - 5.558	0.670	0*	1.42	0* - 5.6	0.746	not significant
TA102 (+S9)	084455	Mellow Sticks	0 - 5.558	3.46	0 - 5.559	1.53	0 - 5.556	2.68	2.56	0.562	0.141 - 4.97	0.045	significant
TA102 (+S9)	084456	Copenhagen Long Cut	0 - 5.559	8.03	0 - 5.558	2.00	0 - 5.559	4.17	4.74	1.76	0* - 12.3	0.115	not significant
TA102 (+S9)	084457	Ariva Wintergreen	0 - 5.556	-2.24	0 - 5.556	-0.834	0 - 5.556	-1.69	0*	0.410	0* - 0.174	0.061	not significant
TA102 (+S9)	084458	Fresh Orbs	0 - 5.558	-11.9	0 - 5.557	1.35	0 - 5.556	-8.35	0*	3.96	0* - 10.7	0.252	not significant
TA102 (-S9)	084394	Camel SNUS Frost	0 - 5.556	-2.44	0 - 2.779	5.49	0 - 5.557	-1.42	0.546	2.49	0* - 11.3	0.847	not significant
TA102 (-S9)	084395	2S3	0 - 5.558	1.78	0 - 5.558	5.40	0 - 5.557	12.3	6.51	3.10	0* - 19.9	0.171	not significant

**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/mg 'Extracted Smokeless Tobacco in DMSO' (ST))**

			Number of Revertant Colonies/mg 'Extracted Smokeless Tobacco in DMSO'										
Strain and S9 Activation	Sample ID	Sample Description	Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'ST' Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard			t-test p-value (H ₀ : mean = 0)	
			(mg ST/plate)	slope	(mg ST/plate)	slope	(mg ST/plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA102 (-S9)	084454	Fresh Strips	0 - 5.558	-0.802	0 - 5.557	5.84	0 - 1.389	47.3	17.5	15.1	0* - 82.3	0.366	not significant
TA102 (-S9)	084455	Mellow Sticks	0 - 2.779	3.79	0 - 5.559	3.11	0 - 5.556	0.227	2.38	1.09	0* - 7.07	0.162	not significant
TA102 (-S9)	084456	Copenhagen Long Cut	0 - 5.559	-0.022	0 - 5.558	4.87	0 - 2.78	31.5	12.1	9.79	0* - 54.2	0.342	not significant
TA102 (-S9)	084457	Ariva Wintergreen	0 - 5.556	-4.62	0 - 5.556	-7.76	0 - 5.556	-0.872	0*	1.99	0* - 4.15	0.157	not significant
TA102 (-S9)	084458	Fresh Orbs	0 - 5.558	-18.2	0 - 5.557	2.41	0 - 5.556	3.03	0*	6.99	0* - 25.8	0.604	not significant
TA1535 (+S9)	084394	Camel SNUS Frost	0 - 5.556	0.085	0 - 5.558	0.521	0 - 5.557	-1.04	0*	0.465	0* - 1.86	0.785	not significant
TA1535 (+S9)	084395	2S3	0 - 5.558	0.370	0 - 5.558	0.150	0 - 5.557	-0.052	0.156	0.122	0* - 0.679	0.328	not significant
TA1535 (+S9)	084454	Fresh Strips	0 - 5.558	0.364	0 - 5.557	0.333	0 - 5.558	-0.362	0.112	0.237	0* - 1.13	0.684	not significant
TA1535 (+S9)	084455	Mellow Sticks	0 - 5.558	-0.066	0 - 5.559	-0.793	0 - 2.778	1.51	0.216	0.678	0* - 3.13	0.781	not significant
TA1535 (+S9)	084456	Copenhagen Long Cut	0 - 5.559	0.171	0 - 5.558	0.216	0 - 5.559	-0.233	0.051	0.143	0* - 0.666	0.753	not significant
TA1535 (+S9)	084457	Ariva Wintergreen	0 - 5.556	1.22	0 - 5.556	0.791	0 - 5.556	-0.937	0.357	0.659	0* - 3.19	0.642	not significant
TA1535 (+S9)	084458	Fresh Orbs	0 - 5.558	0.244	0 - 5.557	0.030	0 - 5.556	-0.722	0*	0.293	0* - 1.11	0.661	not significant
TA1535 (-S9)	084394	Camel SNUS Frost	0 - 5.556	0.069	0 - 5.558	0.958	0 - 5.557	-0.561	0.155	0.440	0* - 2.05	0.758	not significant
TA1535 (-S9)	084395	2S3	0 - 5.558	-0.270	0 - 5.558	0.294	0 - 5.557	0.933	0.319	0.347	0* - 1.81	0.455	not significant
TA1535 (-S9)	084454	Fresh Strips	0 - 2.779	0.670	0 - 2.779	1.64	0 - 2.779	1.10	1.14	0.282	0* - 2.35	0.056	not significant
TA1535 (-S9)	084455	Mellow Sticks	0 - 5.558	-0.794	0 - 5.559	0.066	0 - 5.556	-0.063	0*	0.268	0* - 0.888	0.429	not significant
TA1535 (-S9)	084456	Copenhagen Long Cut	0 - 5.559	0.392	0 - 5.558	0.917	0 - 2.78	1.78	1.03	0.404	0* - 2.77	0.126	not significant
TA1535 (-S9)	084457	Ariva Wintergreen	0 - 1.389	4.08	0 - 5.556	0.779	0 - 5.556	-0.311	1.52	1.32	0* - 7.19	0.370	not significant
TA1535 (-S9)	084458	Fresh Orbs	0 - 1.389	4.11	0 - 2.778	2.19	0 - 5.556	0.185	2.16	1.13	0* - 7.04	0.197	not significant
TA1537 (+S9)	084394	Camel SNUS Frost	0 - 2.778	2.92	0 - 5.558	1.26	0 - 5.557	1.32	1.83	0.544	0* - 4.17	0.078	not significant
TA1537 (+S9)	084395	2S3	0 - 1.39	7.81	0 - 5.558	1.07	0 - 5.557	0.976	3.29	2.26	0* - 13	0.284	not significant
TA1537 (+S9)	084454	Fresh Strips	0 - 5.558	0.187	0 - 5.557	-0.076	0 - 5.558	-0.307	0*	0.143	0* - 0.549	0.690	not significant
TA1537 (+S9)	084455	Mellow Sticks	0 - 5.558	-0.366	0 - 5.559	0.237	0 - 5.556	0.563	0.145	0.272	0* - 1.31	0.648	not significant
TA1537 (+S9)	084456	Copenhagen Long Cut	0 - 2.779	2.42	0 - 2.779	1.85	0 - 5.559	1.02	1.76	0.406	0.018 - 3.51	0.049	significant
TA1537 (+S9)	084457	Ariva Wintergreen	0 - 5.556	-0.361	0 - 5.556	0.584	0 - 5.556	-0.223	0*	0.295	0* - 1.27	0.999	not significant
TA1537 (+S9)	084458	Fresh Orbs	0 - 5.558	1.38	0 - 5.557	-0.191	0 - 5.556	0.061	0.415	0.486	0* - 2.51	0.483	not significant
TA1537 (-S9)	084394	Camel SNUS Frost	0 - 1.389	4.15	0 - 5.558	0.873	0 - 2.778	2.20	2.41	0.951	0* - 6.5	0.127	not significant
TA1537 (-S9)	084395	2S3	0 - 5.558	1.86	0 - 2.779	1.89	0 - 2.779	0.608	1.45	0.423	0* - 3.27	0.075	not significant
TA1537 (-S9)	084454	Fresh Strips	0 - 5.558	-0.085	0 - 5.557	0.269	0 - 5.558	0.111	0.098	0.102	0* - 0.538	0.438	not significant
TA1537 (-S9)	084455	Mellow Sticks	0 - 5.558	0.069	0 - 5.559	-0.276	0 - 5.556	-0.244	0*	0.110	0* - 0.323	0.305	not significant
TA1537 (-S9)	084456	Copenhagen Long Cut	0 - 5.559	0.127	0 - 5.558	-0.370	0 - 5.559	0.384	0.047	0.221	0* - 0.999	0.850	not significant
TA1537 (-S9)	084457	Ariva Wintergreen	0 - 5.556	0.033	0 - 5.556	-0.473	0 - 5.556	0.363	0*	0.243	0* - 1.02	0.925	not significant
TA1537 (-S9)	084458	Fresh Orbs	0 - 2.779	1.07	0 - 5.557	0.292	0 - 5.556	-0.255	0.368	0.383	0* - 2.02	0.439	not significant

0*: Mean or lower bound of the 95% confidence interval has been truncated at 0.

One-Way ANOVA of Mean 'Extracted Smokeless Tobacco' Slope Estimates Among Test Samples

TA98 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	25.34344663	6	4.223907772	1.843	0.162
Within Samples	32.0863542	14	2.291882443		
Total (Corr.)	57.42980084	20			

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	246.4331607	6	41.07219345	0.574	0.745
Within Samples	1002.588573	14	71.6134695		
Total (Corr.)	1249.021734	20			

TA102 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	6329.977012	6	1054.996169	11.796	0.000
Within Samples	1252.09159	14	89.43511359		
Total (Corr.)	7582.068602	20			

TA1535 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.616518762	6	0.102753127	0.186	0.976
Within Samples	7.721113541	14	0.55150811		
Total (Corr.)	8.337632303	20			

TA1537 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	29.06242817	6	4.843738028	1.882	0.154
Within Samples	36.02530581	14	2.573236129		
Total (Corr.)	65.08773398	20			

One-Way ANOVA of Mean 'Extracted Smokeless Tobacco' Slope Estimates Among Test Samples

TA98 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	3.336241037	6	0.556040173	1.922	0.147
Within Samples	4.050267975	14	0.289304855		
Total (Corr.)	7.386509012	20			

TA100 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	463.375301	6	77.22921683	1.496	0.250
Within Samples	722.732757	14	51.62376835		
Total (Corr.)	1186.108058	20			

TA102 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	1218.56803	6	203.0946717	1.207	0.359
Within Samples	2355.101109	14	168.2215078		
Total (Corr.)	3573.669139	20			

TA1535 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	12.84511755	6	2.140852925	1.366	0.294
Within Samples	21.93974156	14	1.567124397		
Total (Corr.)	34.78485911	20			

TA1537 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	16.6869585	6	2.78115975	4.767	0.008
Within Samples	8.167497821	14	0.583392701		
Total (Corr.)	24.85445632	20			

One-way ANOVA analysis indicates significant differences (at $\alpha = 0.05$) among mean 'Extracted Smokeless Tobacco' specific activity slope estimates for test samples with TA102 (+S9) and TA1537 (-S9).

**Evaluation of Ratio (Max ÷ Min) of Standard Deviations of
'Extracted Smokeless Tobacco' Slope Estimates and
Corresponding Method of Comparison**

Strain and S9 Activation	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	4.9	ANOVA (equal variance)
TA98 (-S9)	4.1	ANOVA (equal variance)
TA100 (+S9)	3.4	ANOVA (equal variance)
TA100 (-S9)	15.9	Pairwise T-test (unequal variance)
TA102 (+S9)	30.9	Pairwise T-test (unequal variance)
TA102 (-S9)	13.8	ANOVA (equal variance)
TA1535 (+S9)	5.6	ANOVA (equal variance)
TA1535 (-S9)	4.9	ANOVA (equal variance)
TA1537 (+S9)	15.9	Pairwise T-test (unequal variance)
TA1537 (-S9)	9.3	ANOVA (equal variance)

**Evaluation of Ratio (Max ÷ Min) of Standard Deviations of
'Extracted Smokeless Tobacco' Slope Estimates and
Corresponding Method of Comparison**

**ANOVA-Based Comparison Tests of Mean 'Extracted Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

ANOVA-Based Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	1.3404	0.2663	not significant	0.83	0.3783	not significant	9.8385	0.0073	not significant	0.2459	0.6276	not significant	1.2307	0.2860	not significant
084394 vs. 084454	0.7810	0.3918	not significant	0.2121	0.6522	not significant	37.627	0.0000	significant	0.1785	0.6791	not significant	2.0999	0.1693	not significant
084394 vs. 084455	0.0548	0.8184	not significant	0.0889	0.7700	not significant	32.883	0.0001	significant	0.3531	0.5618	not significant	1.6600	0.2185	not significant
084394 vs. 084456	2.86	0.1128	not significant	1.45	0.2487	not significant	29.727	0.0001	significant	0.1046	0.7512	not significant	0.0028	0.9589	not significant
084394 vs. 084457	0.4074	0.5336	not significant	0.3144	0.5838	not significant	39.333	0.0000	significant	0.6841	0.4221	not significant	1.9575	0.1835	not significant
084394 vs. 084458	0.5711	0.4623	not significant	0.1518	0.7027	not significant	47.373	0.0000	significant	0.0001	0.9940	not significant	1.1701	0.2977	not significant
084395 vs. 084454	4.17	0.0605	not significant	0.20	0.6601	not significant	8.9845	0.0096	not significant	0.0054	0.9425	not significant	6.5458	0.0227	not significant
084395 vs. 084455	1.9371	0.1857	not significant	0.37	0.5505	not significant	6.7481	0.0211	not significant	0.0097	0.9231	not significant	5.7493	0.0310	not significant
084395 vs. 084456	0.2854	0.6016	not significant	0.0863	0.7733	not significant	5.3622	0.0363	not significant	0.0298	0.8655	not significant	1.3499	0.2647	not significant
084395 vs. 084457	3.23	0.0941	not significant	0.12	0.7322	not significant	9.8282	0.0073	not significant	0.1097	0.7454	not significant	6.2925	0.0251	not significant
084395 vs. 084458	0.1616	0.6937	not significant	1.69	0.2148	not significant	14.034	0.0022	significant	0.2536	0.6224	not significant	4.8009	0.0459	not significant
084454 vs. 084455	0.4222	0.5264	not significant	0.0264	0.8733	not significant	0.1598	0.6954	not significant	0.0295	0.8661	not significant	0.0258	0.8746	not significant
084454 vs. 084456	6.63	0.0220	not significant	0.55	0.4698	not significant	0.4648	0.5065	not significant	0.0098	0.9224	not significant	1.9506	0.1843	not significant
084454 vs. 084457	0.0603	0.8096	not significant	0.0100	0.9216	not significant	0.0189	0.8925	not significant	0.1637	0.6919	not significant	0.0025	0.9608	not significant
084454 vs. 084458	2.6880	0.1234	not significant	0.7228	0.4095	not significant	0.5606	0.4664	not significant	0.1851	0.6736	not significant	0.1350	0.7188	not significant
084455 vs. 084456	3.71	0.0747	not significant	0.82	0.3805	not significant	0.0796	0.7820	not significant	0.0734	0.7905	not significant	1 5275	0.2368	not significant
084455 vs. 084457	0.1634	0.6922	not significant	0.0690	0.7967	not significant	0.2887	0.5995	not significant	0.0542	0.8192	not significant	0 0123	0.9134	not significant
084455 vs. 084458	0.9796	0.3391	not significant	0.4729	0.5029	not significant	1.3189	0.2700	not significant	0.3623	0.5568	not significant	0.0427	0.8392	not significant
084456 vs. 084457	5.43	0.0353	not significant	0.41	0.5307	not significant	0.6713	0.4263	not significant	0.2537	0.6223	not significant	1.8135	0.1995	not significant
084456 vs. 084458	0.88	0.3650	not significant	2.54	0.1334	not significant	2.0463	0.1745	not significant	0.1096	0.7455	not significant	1.0593	0.3208	not significant
084457 vs. 084458	1.9432	0.1851	not significant	0.9031	0.3581	not significant	0.3735	0.5509	not significant	0.6969	0.4179	not significant	0.1007	0.7556	not significant

**ANOVA-Based Comparison Tests of Mean 'Extracted Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

ANOVA-Based Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	0.8143	0.3821	not significant	0.0003	0.9867	not significant	0.3172	0.5822	not significant	0.0257	0.8749	not significant	2.3399	0.1484	not significant
084394 vs. 084454	0.4662	0.5059	not significant	0.6132	0.4466	not significant	2.5495	0.1326	not significant	0.9211	0.3535	not significant	13.714	0.0024	significant
084394 vs. 084455	4.7519	0.0468	not significant	0.3491	0.5640	not significant	0.0298	0.8653	not significant	0.1678	0.6883	not significant	16.822	0.0011	significant
084394 vs. 084456	0.0034	0.9546	not significant	0.3823	0.5463	not significant	1.1929	0.2932	not significant	0.7310	0.4070	not significant	14.325	0.0020	significant
084394 vs. 084457	0.3569	0.5598	not significant	2.9581	0.1075	not significant	0.2198	0.6464	not significant	1.7722	0.2044	not significant	15.227	0.0016	significant
084394 vs. 084458	0.1143	0.7403	not significant	2.5256	0.1343	not significant	0.2066	0.6564	not significant	3.8548	0.0698	not significant	10.700	0.0056	not significant
084395 vs. 084454	2.5128	0.1352	not significant	0.6400	0.4371	not significant	1.0682	0.3189	not significant	0.6390	0.4374	not significant	4.72	0.0474	not significant
084395 vs. 084455	9.5006	0.0081	not significant	0.3694	0.5531	not significant	0.1524	0.7021	not significant	0.3250	0.5777	not significant	6.61	0.0222	not significant
084395 vs. 084456	0.9223	0.3532	not significant	0.3617	0.5572	not significant	0.2799	0.6051	not significant	0.4824	0.4987	not significant	5.09	0.0407	not significant
084395 vs. 084457	2.2494	0.1559	not significant	3.0166	0.1044	not significant	1.0650	0.3196	not significant	1.3709	0.2612	not significant	5.63	0.0325	not significant
084395 vs. 084458	0.3185	0.5815	not significant	2.5797	0.1306	not significant	1.0357	0.3261	not significant	3.2507	0.0930	not significant	3.03	0.1035	not significant
084454 vs. 084455	2.2413	0.1566	not significant	0.0370	0.8503	not significant	2.0277	0.1764	not significant	1.8752	0.1924	not significant	0.1586	0.6965	not significant
084454 vs. 084456	0.3904	0.5421	not significant	1.9640	0.1829	not significant	0.2545	0.6217	not significant	0.0110	0.9180	not significant	0.0067	0.9361	not significant
084454 vs. 084457	0.0073	0.9332	not significant	0.8776	0.3647	not significant	4.2665	0.0579	not significant	0.1380	0.7158	not significant	0.0396	0.8452	not significant
084454 vs. 084458	1.0421	0.3246	not significant	0.6498	0.4337	not significant	4.2077	0.0594	not significant	1.0073	0.3326	not significant	0.1868	0.6721	not significant
084455 vs. 084456	4.5026	0.0522	not significant	1.4622	0.2466	not significant	0.8454	0.3734	not significant	1.5993	0.2267	not significant	0.1003	0.7562	not significant
084455 vs. 084457	2.5043	0.1359	not significant	1.2748	0.2779	not significant	0.4116	0.5315	not significant	3.0307	0.1036	not significant	0.0397	0.8449	not significant
084455 vs. 084458	6.3401	0.0246	not significant	0.9967	0.3351	not significant	0.3935	0.5406	not significant	5.6312	0.0325	not significant	0.6897	0.4202	not significant
084456 vs. 084457	0.2910	0.5981	not significant	5.4674	0.0347	not significant	2.4368	0.1408	not significant	0.2268	0.6412	not significant	0.0138	0.9083	not significant
084456 vs. 084458	0.1568	0.6981	not significant	4.8733	0.0445	not significant	2.3924	0.1442	not significant	1.2285	0.2864	not significant	0.2640	0.6154	not significant
084457 vs. 084458	0.8751	0.3654	not significant	0.0171	0.8979	not significant	0.0002	0.9888	not significant	0.3996	0.5375	not significant	0.3984	0.5381	not significant

Some ANOVA-based comparison p-values for tester strains TA102 (+S9) and TA1537 (-S9) were significant at $\alpha = 0.05$.

Significant differences in mean 'Extracted Smokeless Tobacco' specific activity slope were detected in TA102 (+S9) between Camel SNUS Frost (084394) and each of {Fresh Strips (084454), Mellow Sticks (084455), Copenhagen Long Cut (084456), Ariva Wintergreen (084457), Fresh Orbs (084458)} and between 2S3 Research Moist Snuff (084395) and Fresh Orbs (084458).

Significant differences in mean 'Extracted Smokeless Tobacco' specific activity slope were detected in TA1537 (-S9) between Camel SNUS Frost (084394) and each of {Fresh Strips (084454), Mellow Sticks (084455), Copenhagen Long Cut (084456), Ariva Wintergreen (084457)}

**Pairwise T-Test Comparisons of Mean 'Extracted Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

Pairwise T-test Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084395							1.76954	0.1515	not significant				0.623998	0.5665	not significant
084394 vs. 084454							8.893338	0.0009	significant				3.376765	0.0279	not significant
084394 vs. 084455							8.577096	0.0010	significant				2.776061	0.0500	not significant
084394 vs. 084456							7.75824	0.0015	significant				0.101308	0.9242	not significant
084394 vs. 084457							9.406724	0.0007	significant				2.963306	0.0414	not significant
084394 vs. 084458							8.195479	0.0012	significant				1.943068	0.1239	not significant
084395 vs. 084454							1.81267	0.1441	not significant				1.477058	0.2137	not significant
084395 vs. 084455							1.579276	0.1894	not significant				1.377127	0.2405	not significant
084395 vs. 084456							1.395745	0.2353	not significant				0.661546	0.5444	not significant
084395 vs. 084457							1.906783	0.1292	not significant				1.43893	0.2236	not significant
084395 vs. 084458							2.17595	0.0952	not significant				1.239249	0.2830	not significant
084454 vs. 084455							2.015307	0.1141	not significant				0.685274	0.5308	not significant
084454 vs. 084456							2.321495	0.0810	not significant				4.25263	0.0131	not significant
084454 vs. 084457							0.71646	0.5133	not significant				0.199945	0.8513	not significant
084454 vs. 084458							1.372319	0.2419	not significant				0.950134	0.3958	not significant
084455 vs. 084456							1.176392	0.3047	not significant				3.313893	0.0295	not significant
084455 vs. 084457							5.964829	0.0040	not significant				0.361574	0.7360	not significant
084455 vs. 084458							2.214629	0.0912	not significant				0.486144	0.6523	not significant
084456 vs. 084457							3.492948	0.0251	not significant				3.516891	0.0245	not significant
084456 vs. 084458							2.545463	0.0636	not significant				2.12945	0.1003	not significant
084457 vs. 084458							1.183984	0.3020	not significant				0.731486	0.5050	not significant

**Pairwise T-Test Comparisons of Mean 'Extracted Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

Pairwise T-test Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084395				0.076598	0.9426	not significant									
084394 vs. 084454				1.952138	0.1227	not significant									
084394 vs. 084455				0.65827	0.5463	not significant									
084394 vs. 084456				0.629179	0.5634	not significant									
084394 vs. 084457				1.381999	0.2391	not significant									
084394 vs. 084458				3.701244	0.0208	not significant									
084395 vs. 084454				2.272052	0.0855	not significant									
084395 vs. 084455				0.693206	0.5263	not significant									
084395 vs. 084456				0.624001	0.5665	not significant									
084395 vs. 084457				1.412546	0.2307	not significant									
084395 vs. 084458				4.183074	0.0139	not significant									
084454 vs. 084455				0.204827	0.8477	not significant									
084454 vs. 084456				1.373578	0.2415	not significant									
084454 vs. 084457				0.735138	0.5030	not significant									
084454 vs. 084458				1.582456	0.1887	not significant									
084455 vs. 084456				0.93133	0.4044	not significant									
084455 vs. 084457				0.74959	0.4952	not significant									
084455 vs. 084458				1.049874	0.3530	not significant									
084456 vs. 084457				1.500341	0.2079	not significant									
084456 vs. 084458				2.139718	0.0991	not significant									
084457 vs. 084458				0.101828	0.9238	not significant									

Pairwise t-test comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean 'Extracted Smokeless Tobacco' specific activity slope were as follows for strain TA102 (+S9):

TA102 (+S9): Camel SNUS Frost (084394) was significantly different from each of {Fresh Strips (084454), Mellow Sticks (084455), Copenhagen Long Cut (084456), Ariva Wintergreen (084457), Fresh Orbs (084458)}

Number of Mean 'Extracted Smokeless Tobacco' Slope Estimates Significantly Greater than Zero (0), the Corresponding Number of Paired Comparisons and Comparison Method

Strain and S9 Activation	# of Significant Mean Slopes	Number of Comparisons	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	1	0		
TA98 (-S9)	1	0		
TA100 (+S9)	3	3	1.4	ANOVA (equal variance)
TA100 (-S9)	1	0		
TA102 (+S9)	2	1	9.1	ANOVA (equal variance)
TA102 (-S9)	0	0		
TA1535 (+S9)	0	0		
TA1535 (-S9)	0	0		
TA1537 (+S9)	1	0		
TA1537 (-S9)	0	0		

One-Way ANOVA and ANOVA-Based Comparisons Among Test Samples of Mean 'Extracted Smokeless Tobacco' Slope Estimates that are Significantly Greater than Zero (0)

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	66.758	2	33.379	1.253	0.351
Within Samples	159.794	6	26.632		
Total (Corr.)	226.552	8			

TA100 (+S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084454 vs. 084455	0.07	0.7989	not significant
084454 vs. 084456	1.48	0.2688	not significant
084455 vs. 084456	2.20	0.1881	not significant

TA102 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	2940.879	1	2940.88	73.57	0.001
Within Samples	159.903	4	39.976		
Total (Corr.)	3100.782	5			

TA102 (+S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084455	73.57	0.0010	significant

Both TA100 (+S9) and TA102 (+S9) strains have more than one test sample for which the mean 'extracted smokeless tobacco' specific activity slope estimate is greater than zero (0) .

TA100 (+S9):

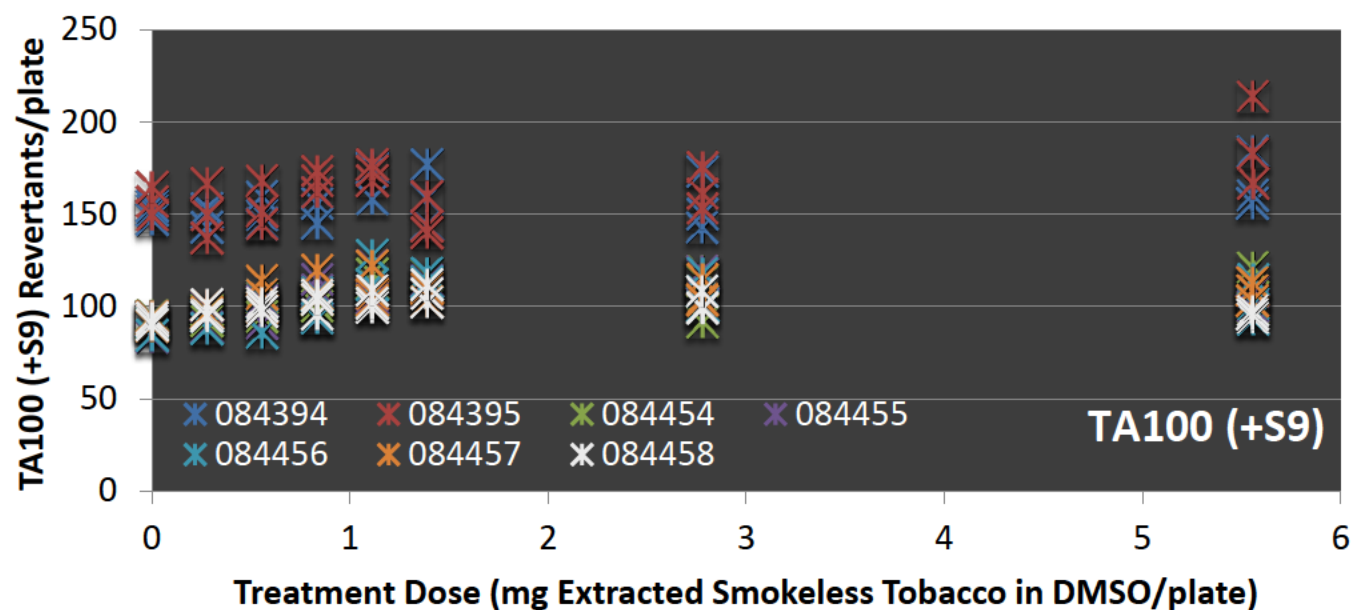
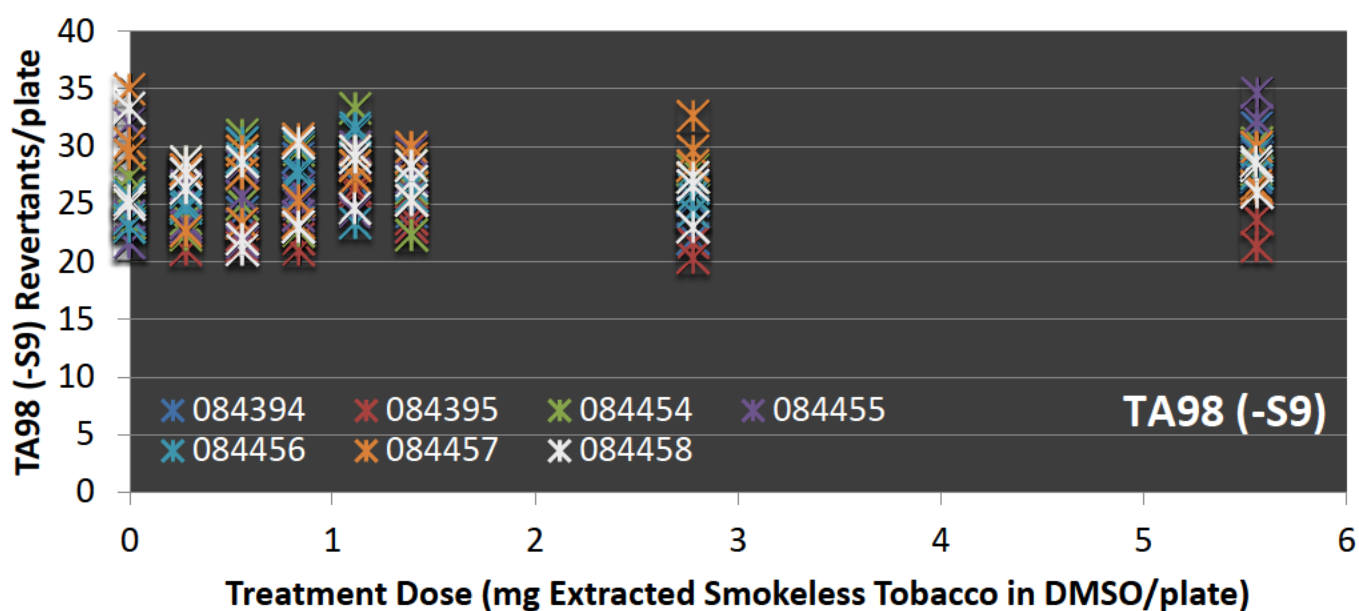
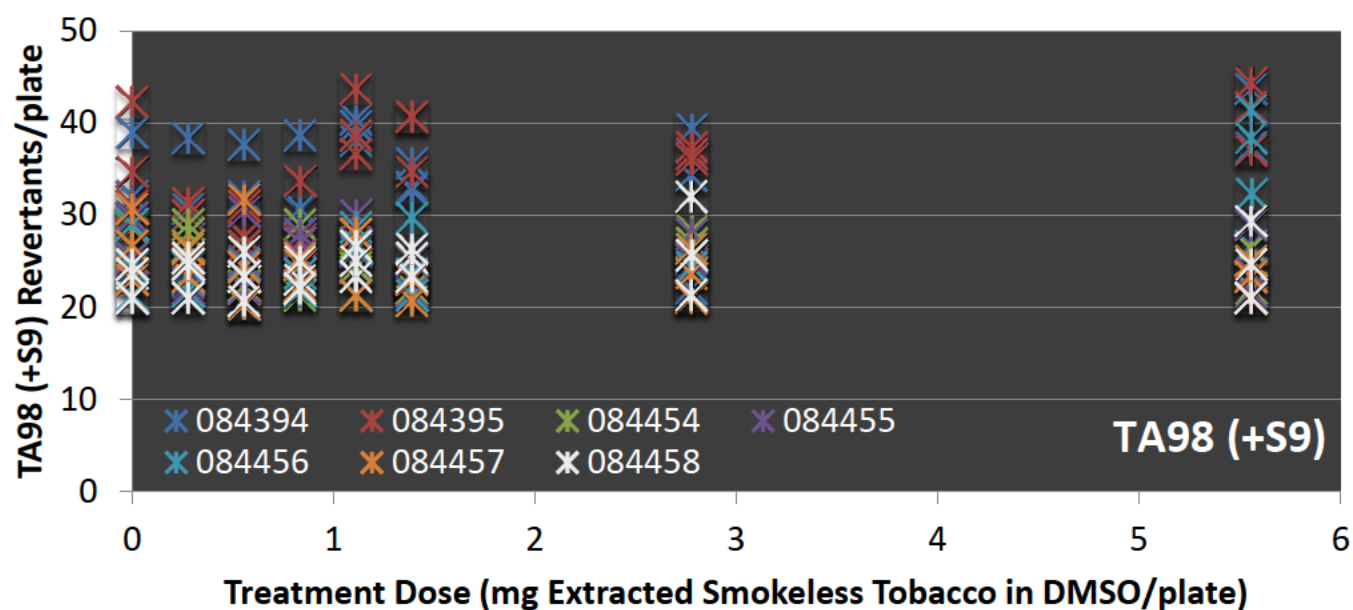
No significant differences among mean 'Extracted Smokeless Tobacco' specific activity slope estimates were detected in TA100 (+S9) among test samples 084454 (Fresh Strips), 084455 (Mellow Sticks) and 084456 (Copenhagen Long Cut).

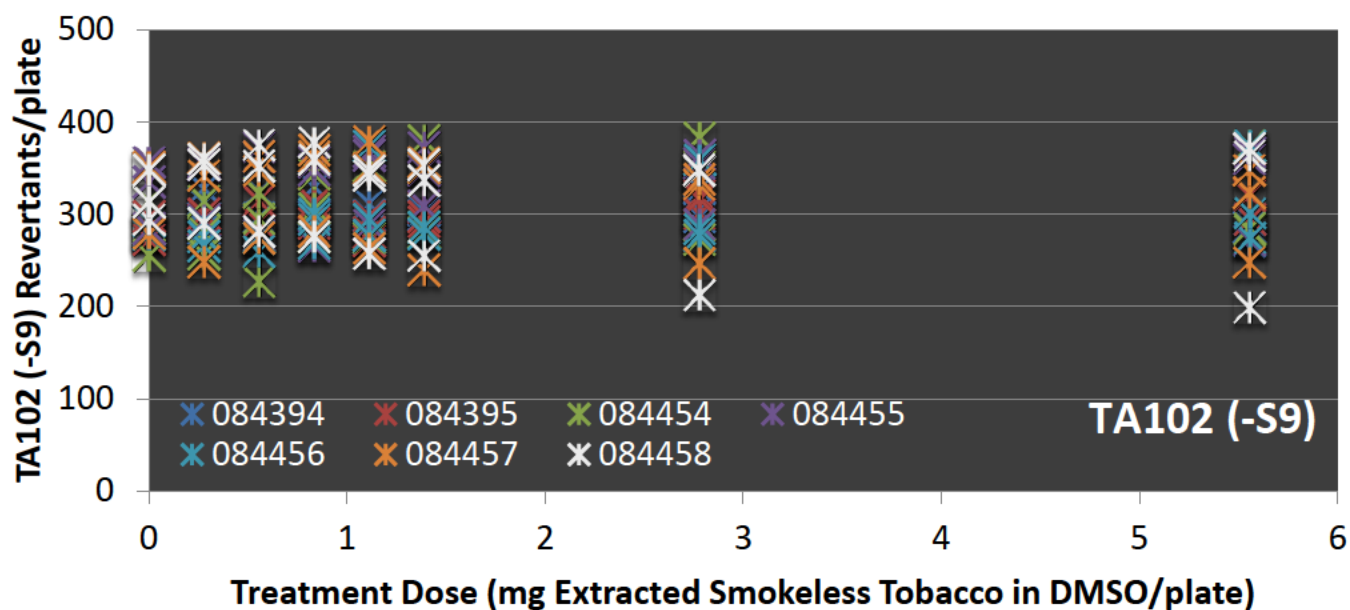
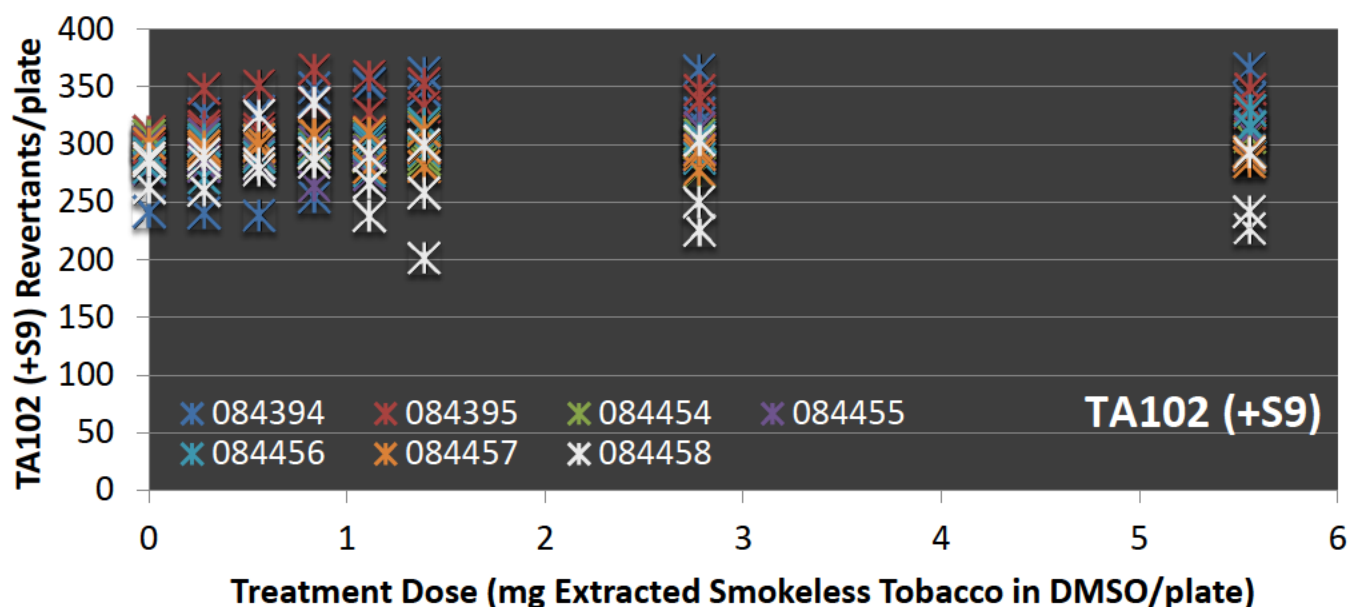
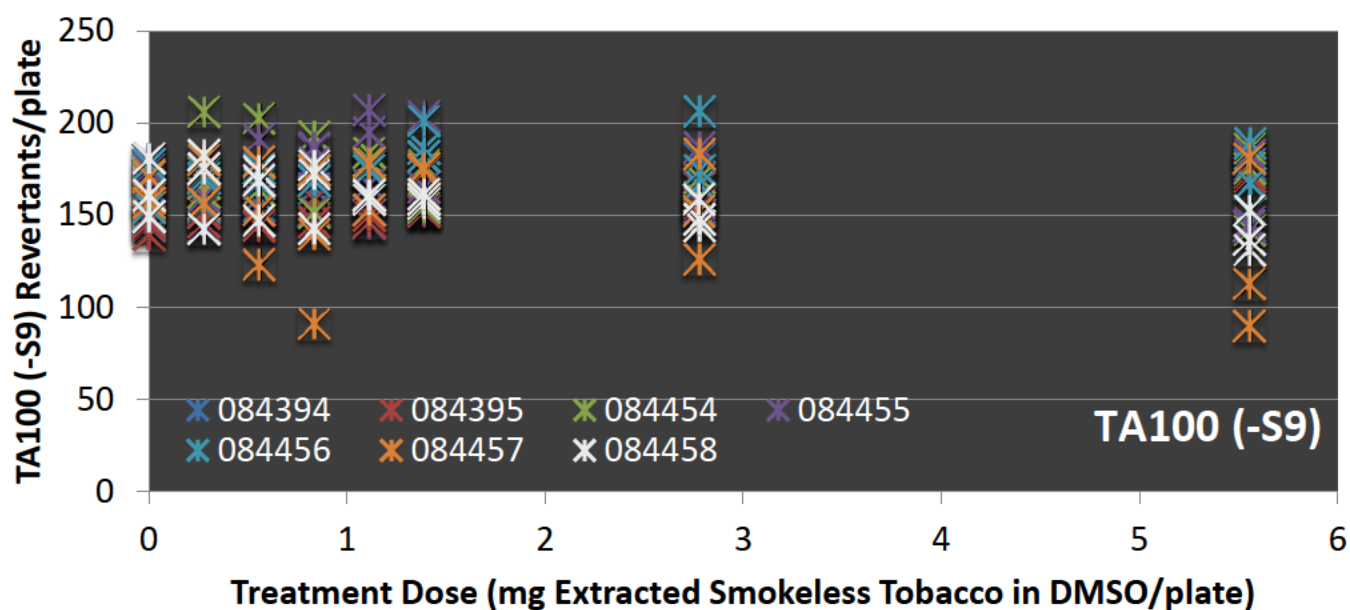
TA102 (+S9):

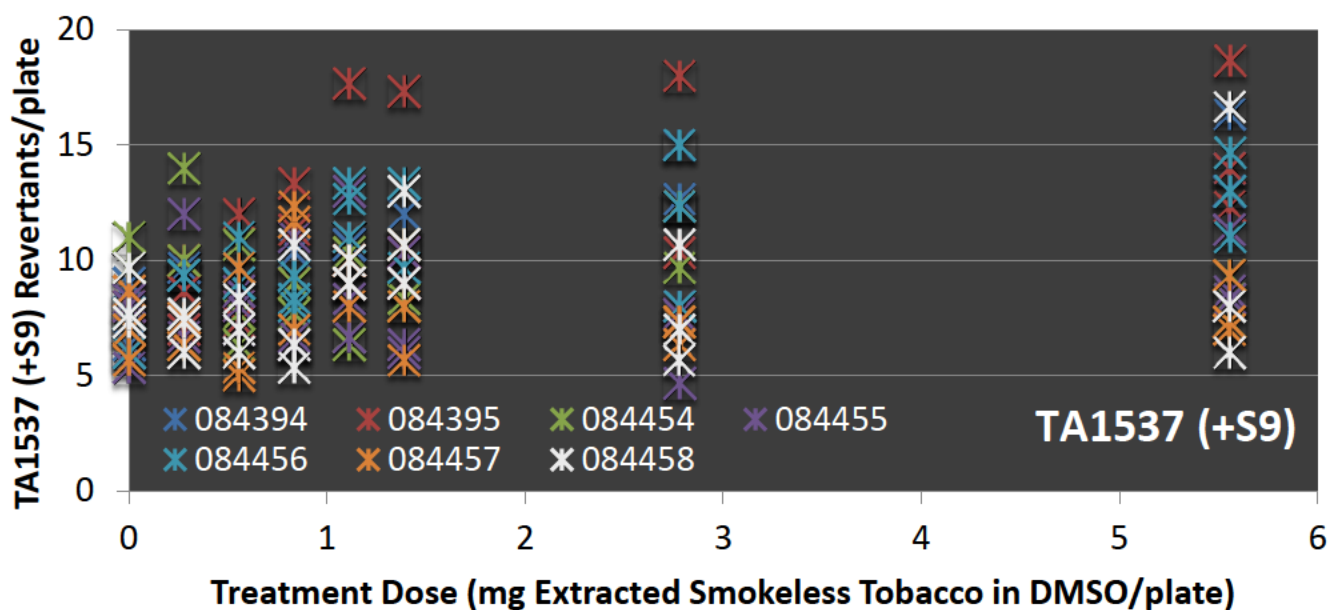
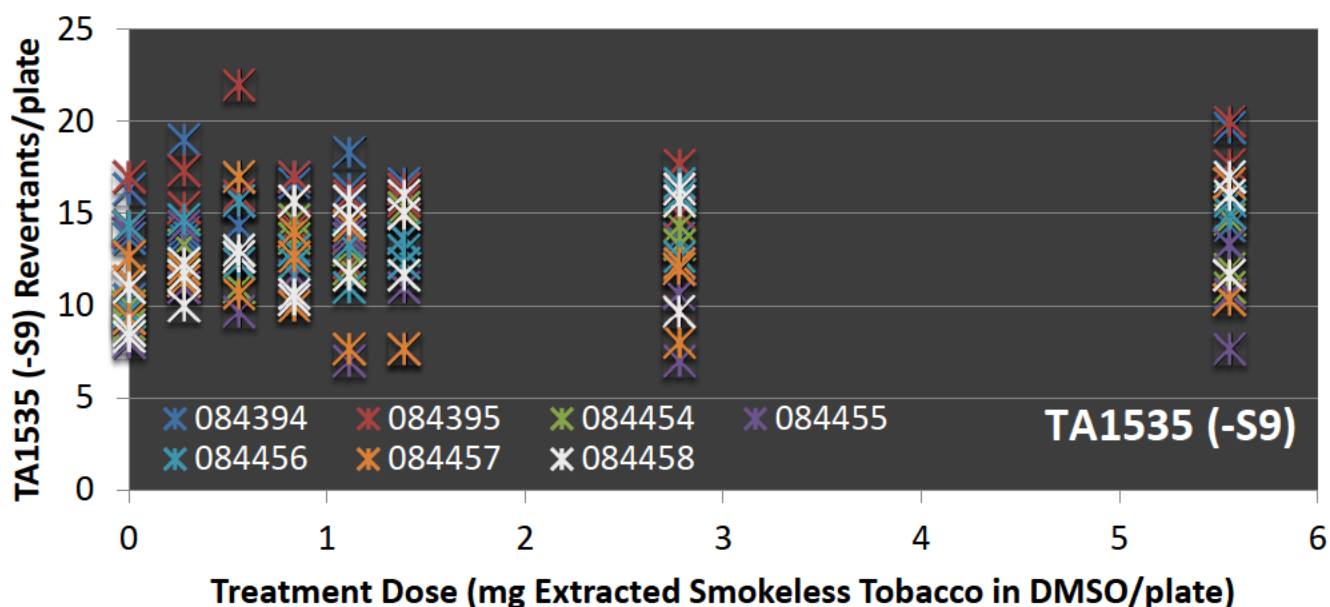
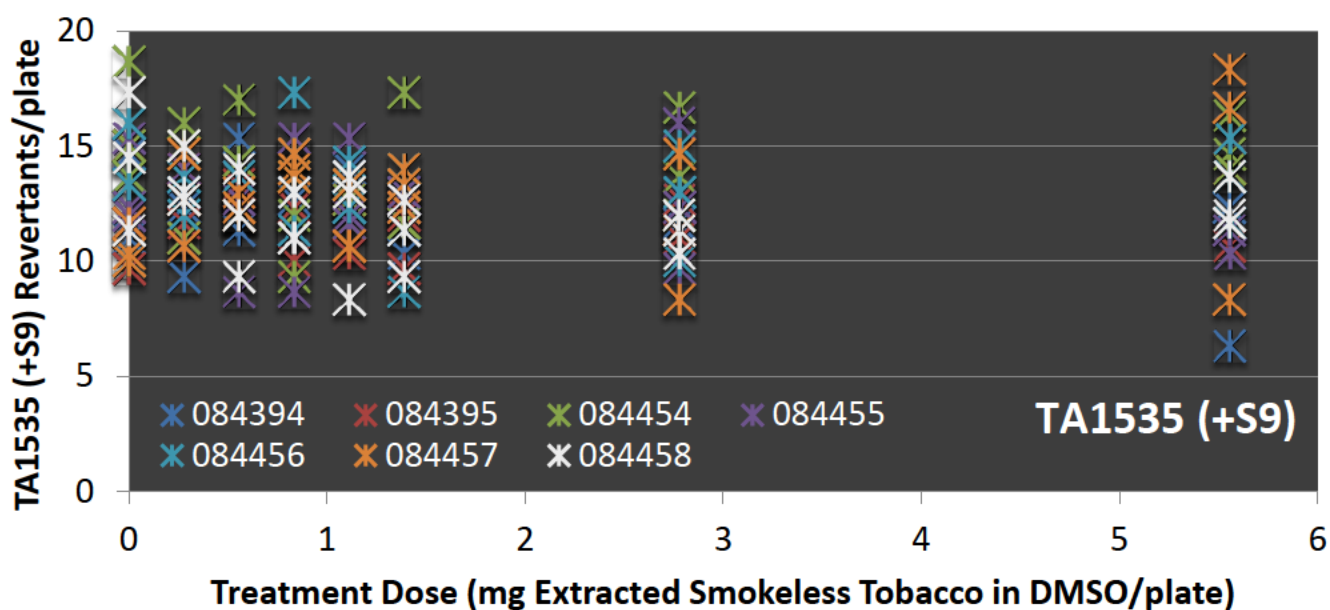
Significant differences among mean 'Extracted Smokeless Tobacco' specific activity slope estimates were detected in TA102 (+S9) between test samples 084394 (Camel SNUS Frost) and 084455 (Mellow Sticks) .

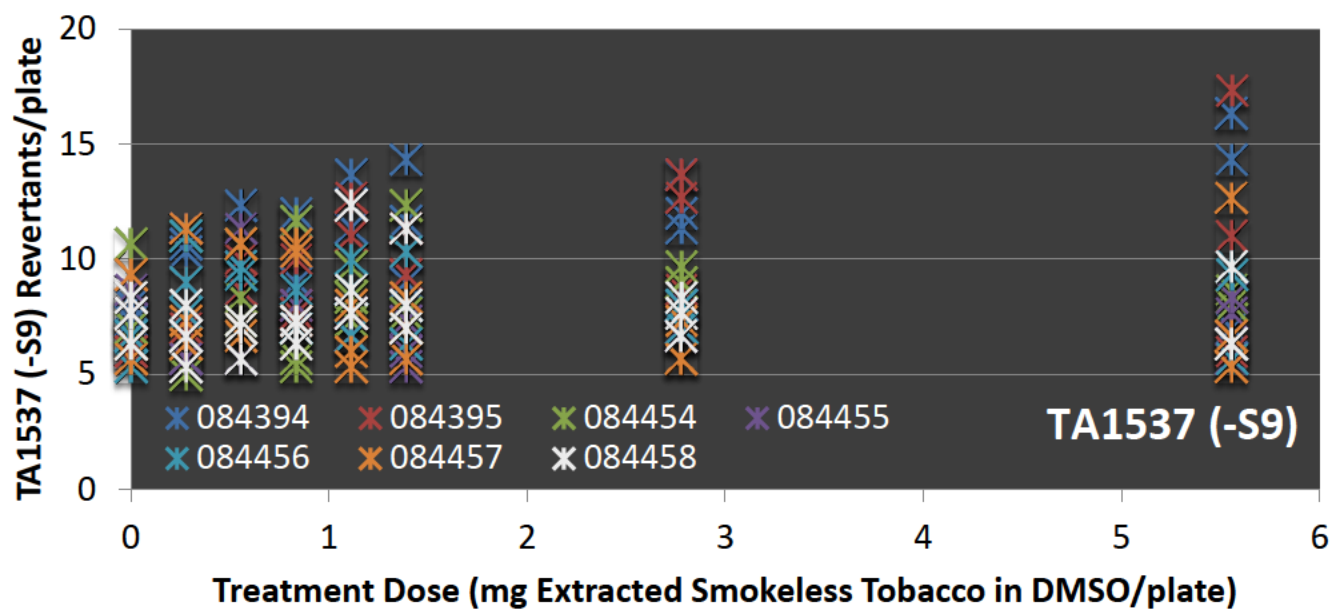
Number of Mean 'Extracted Smokeless Tobacco' Slope Estimates Significantly Greater than Zero (0), the Corresponding Number of Paired Comparisons and Comparison Method

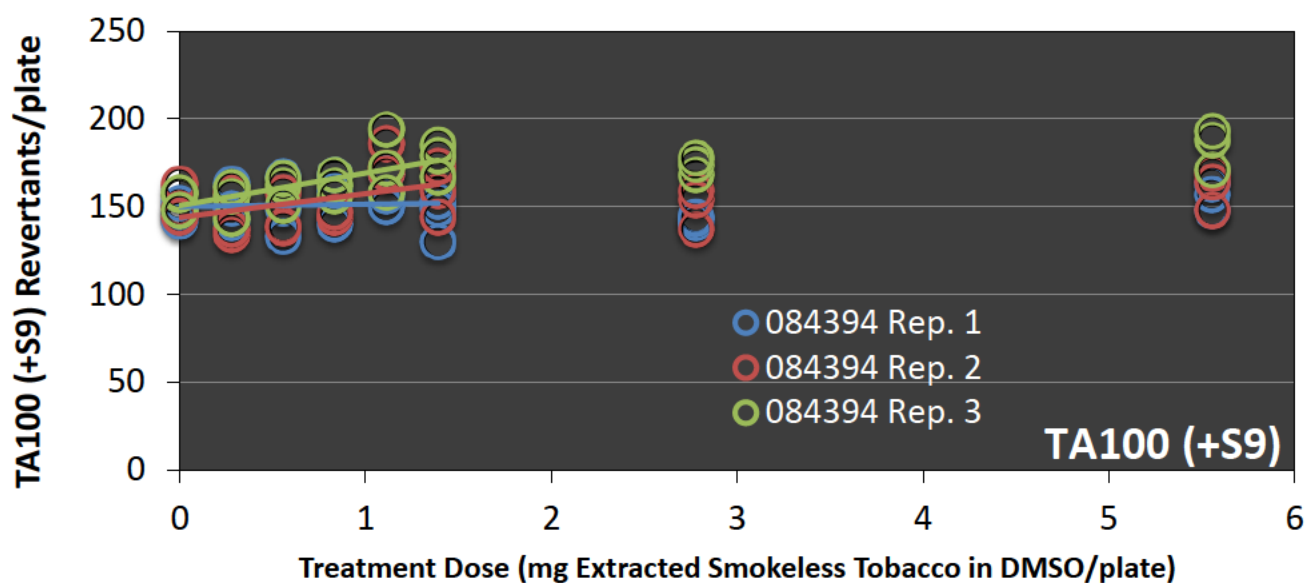
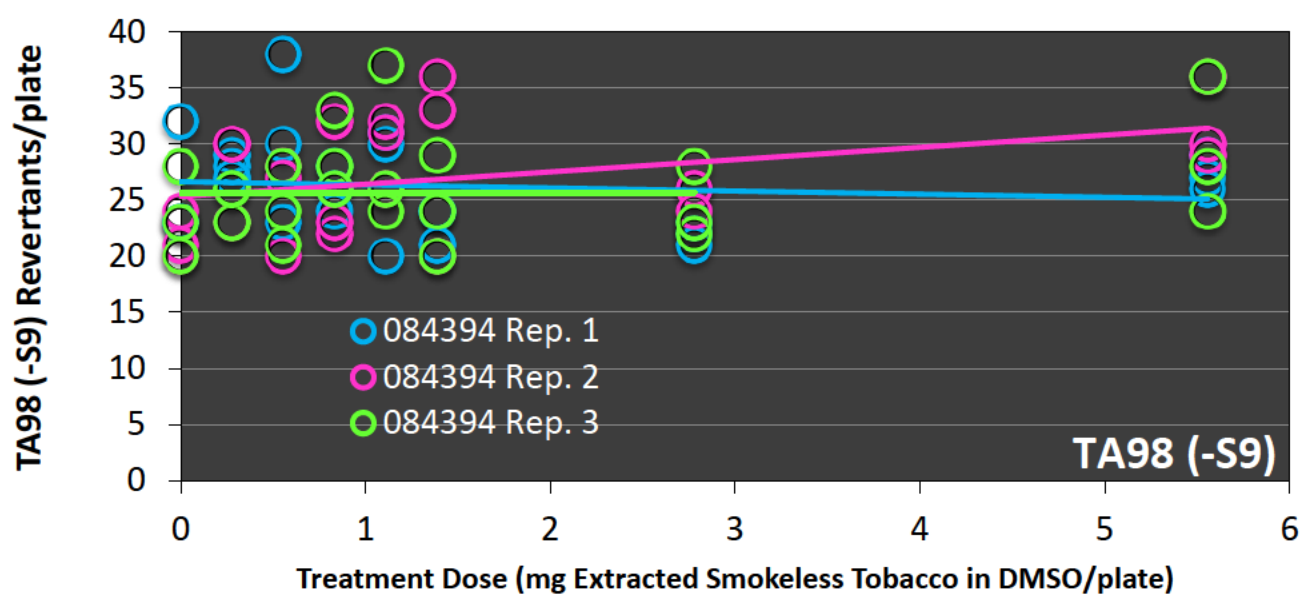
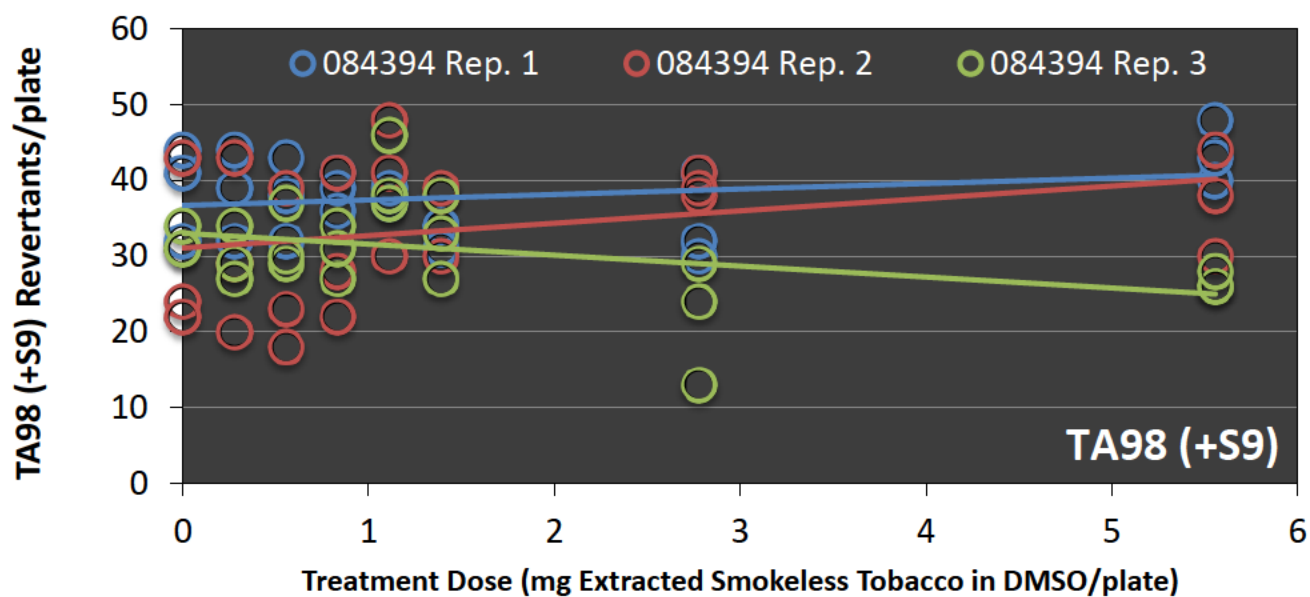
One-Way ANOVA and ANOVA-Based Comparisons Among Test Samples of Mean 'Extracted Smokeless Tobacco' Slope Estimates that are Significantly Greater than Zero (0)

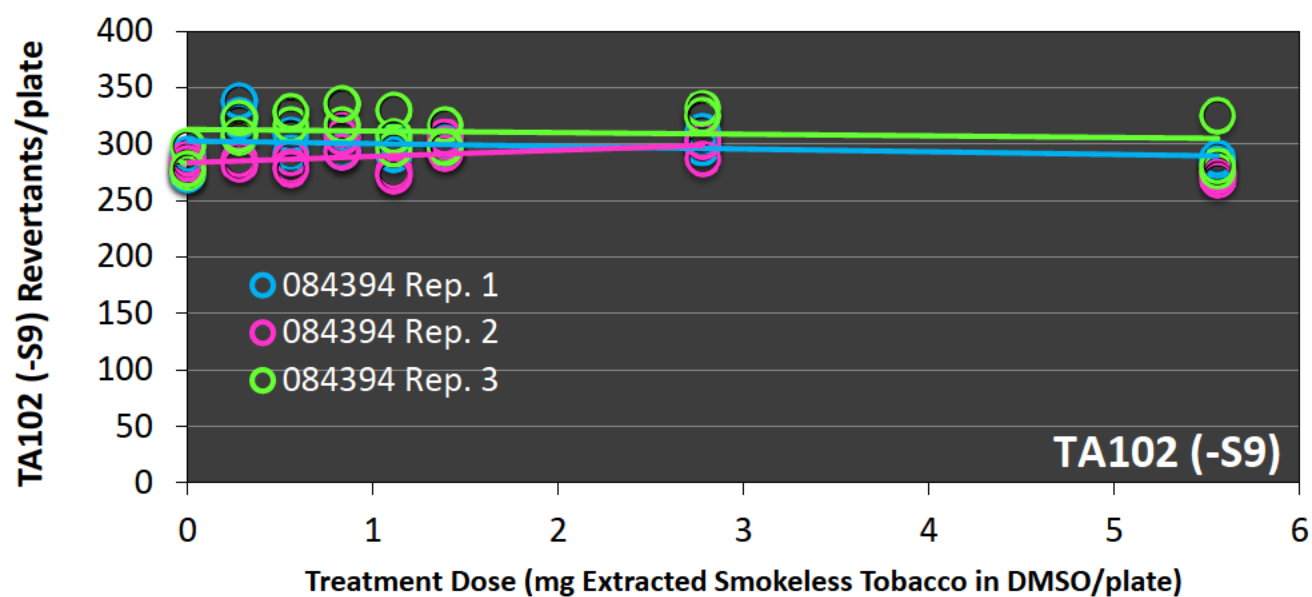
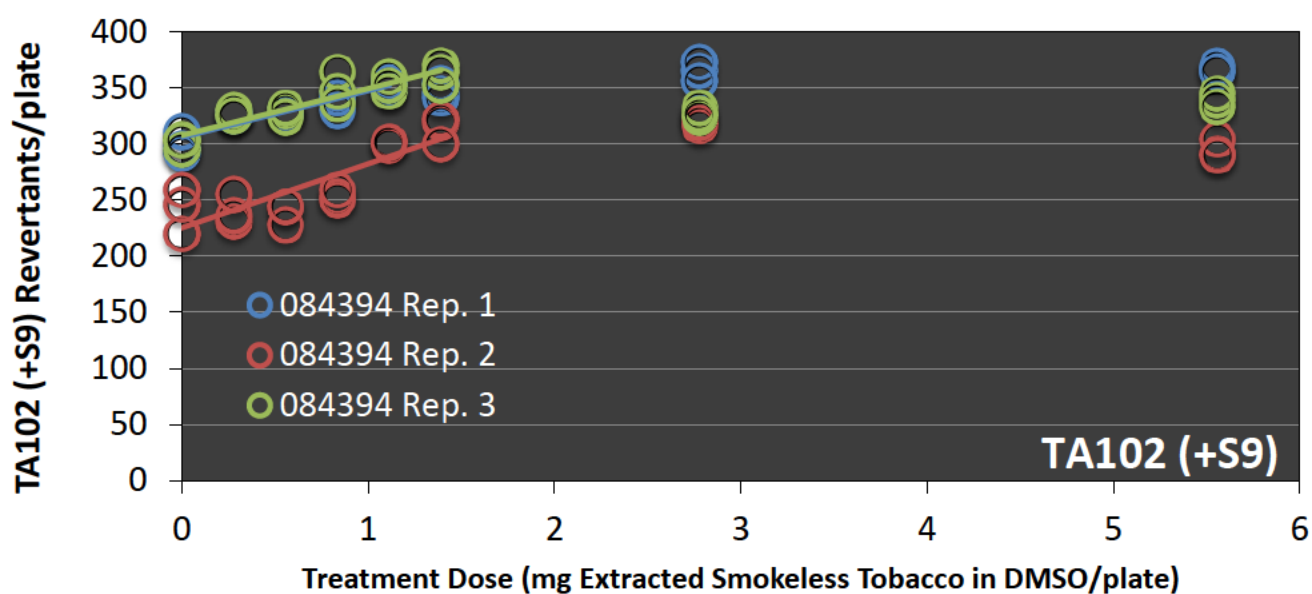
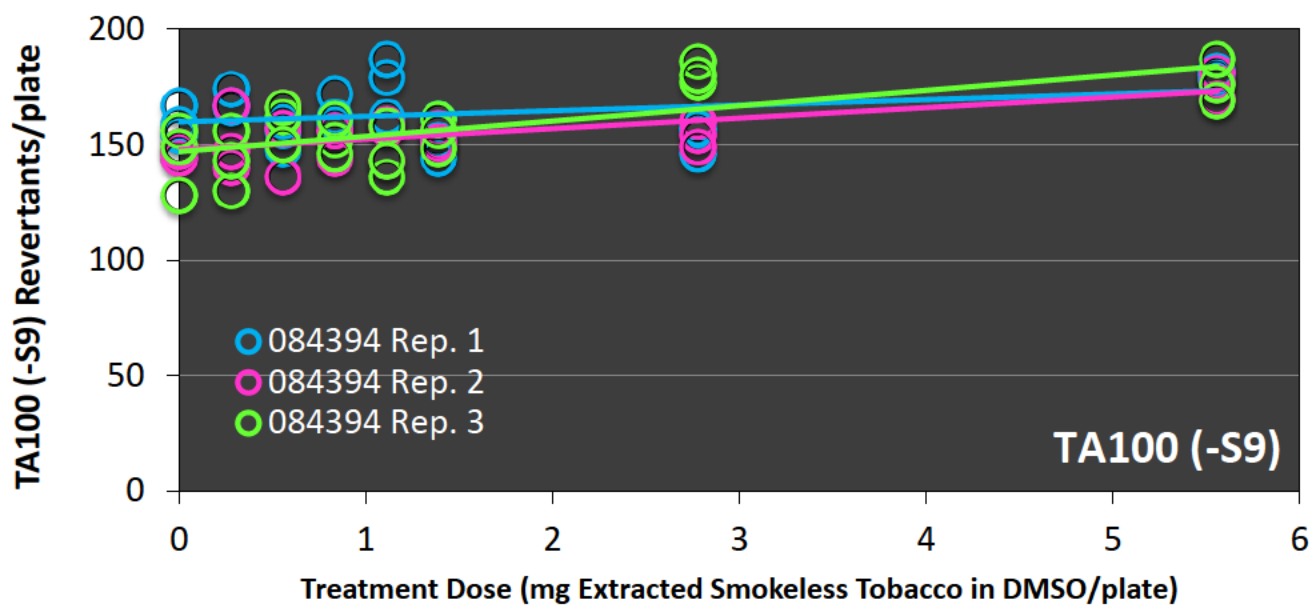


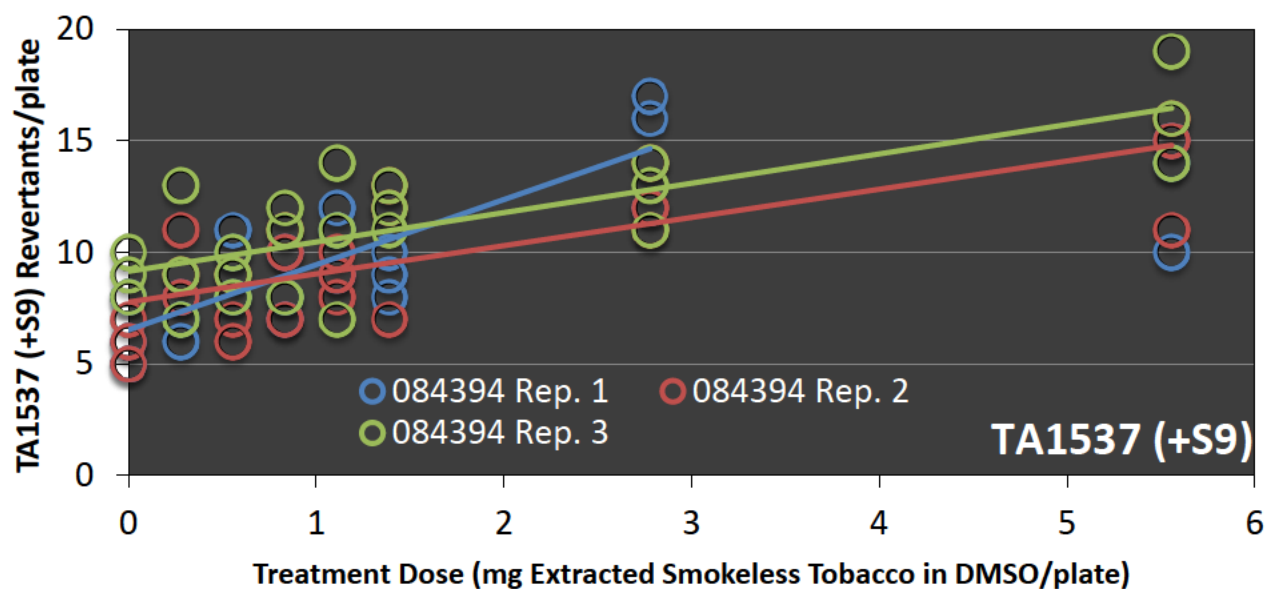
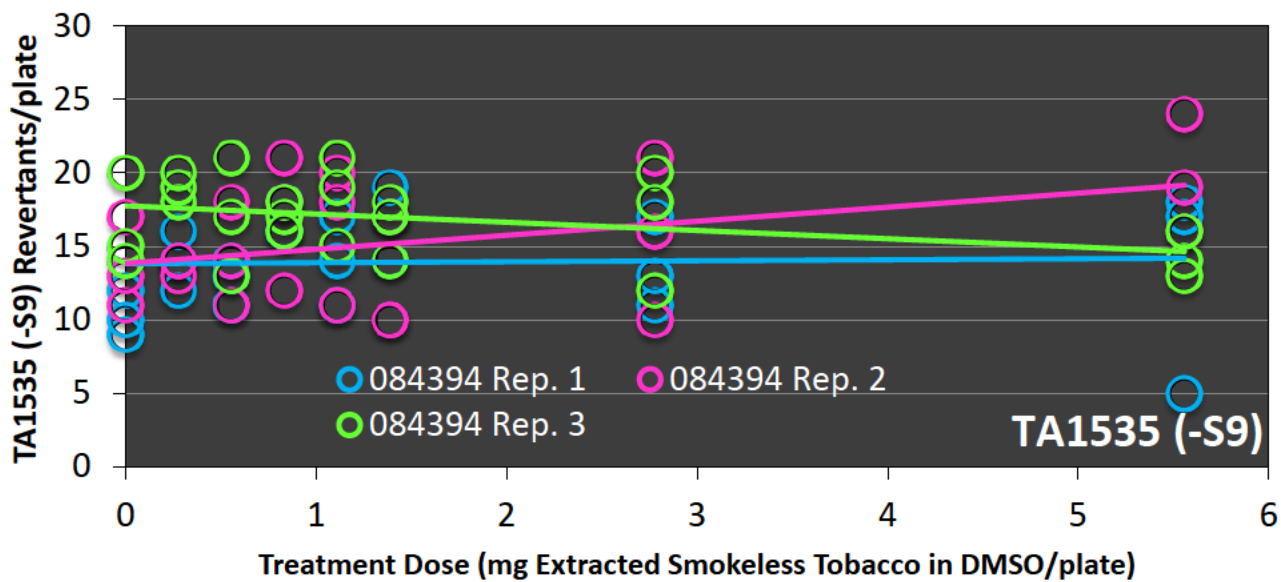
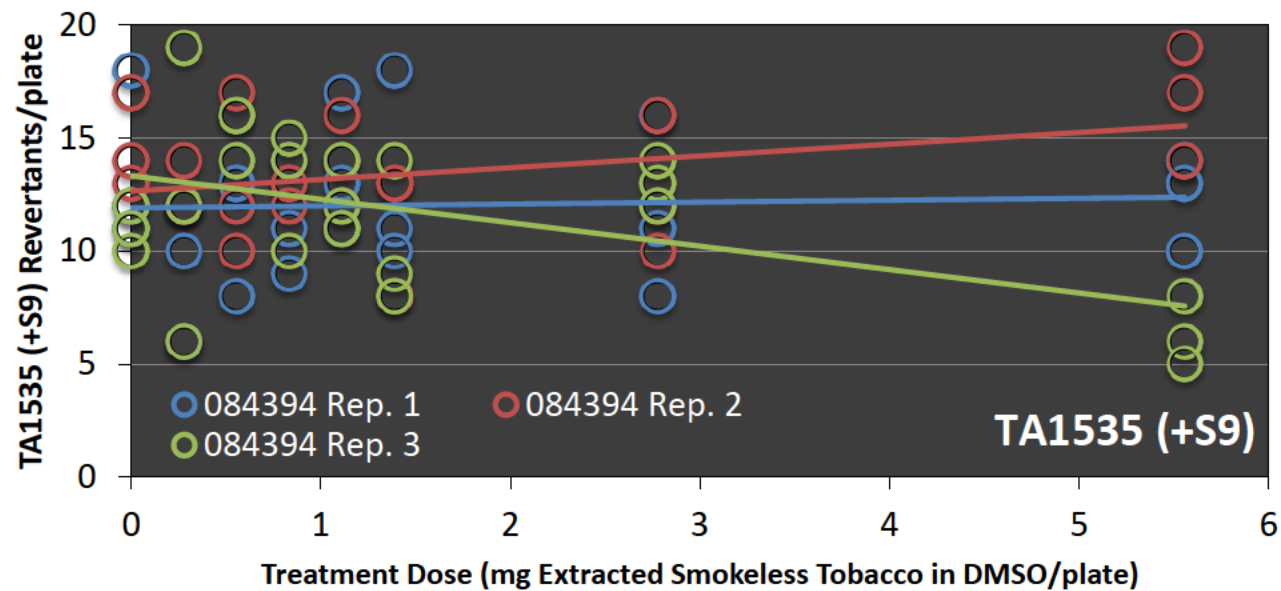


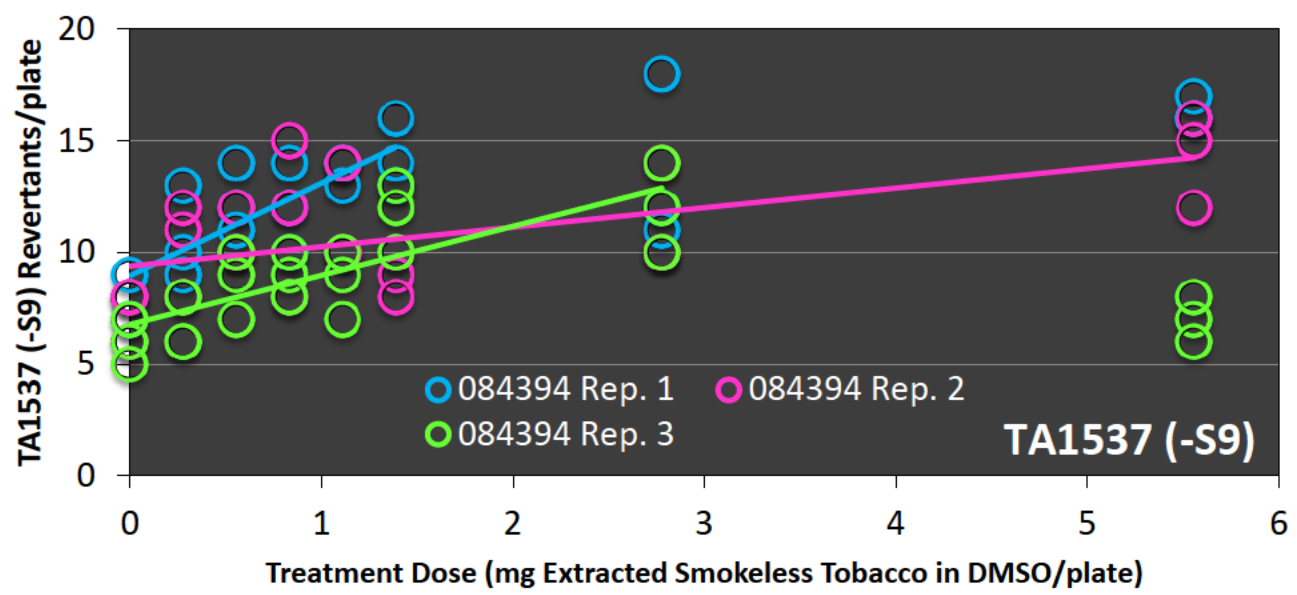


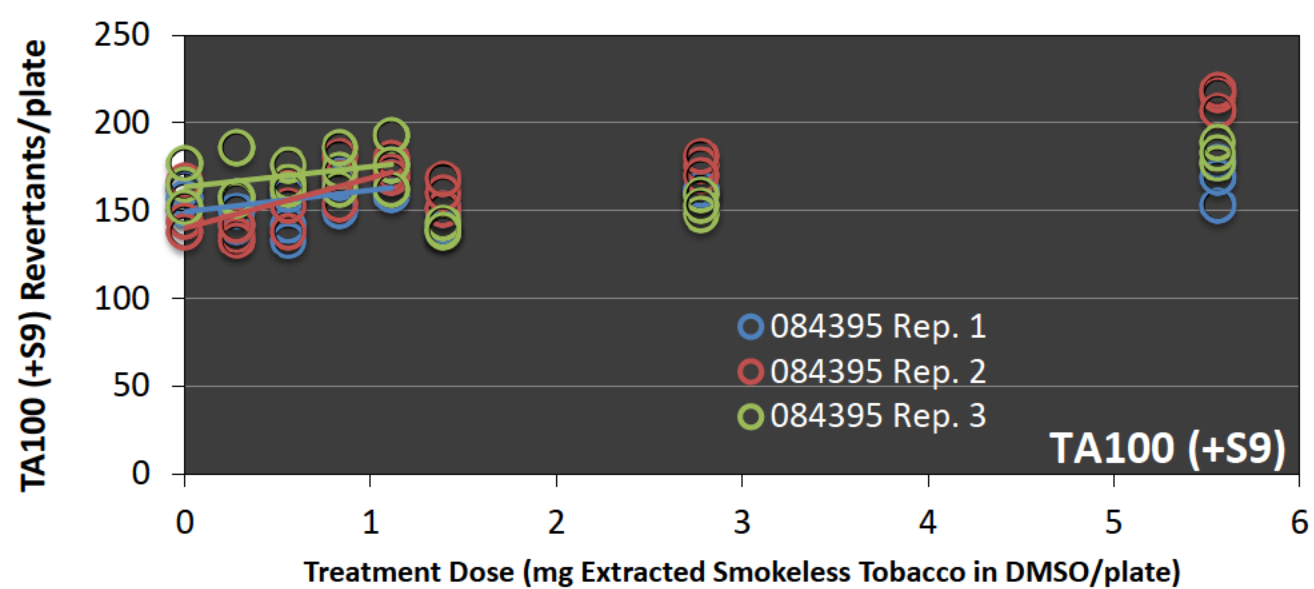
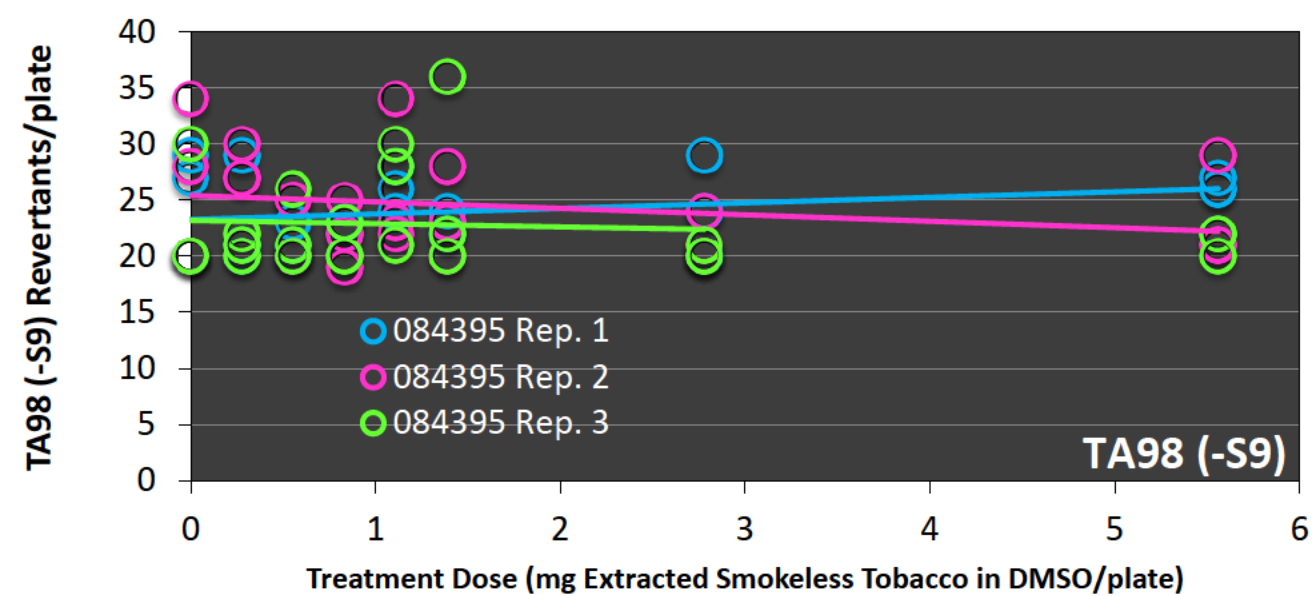
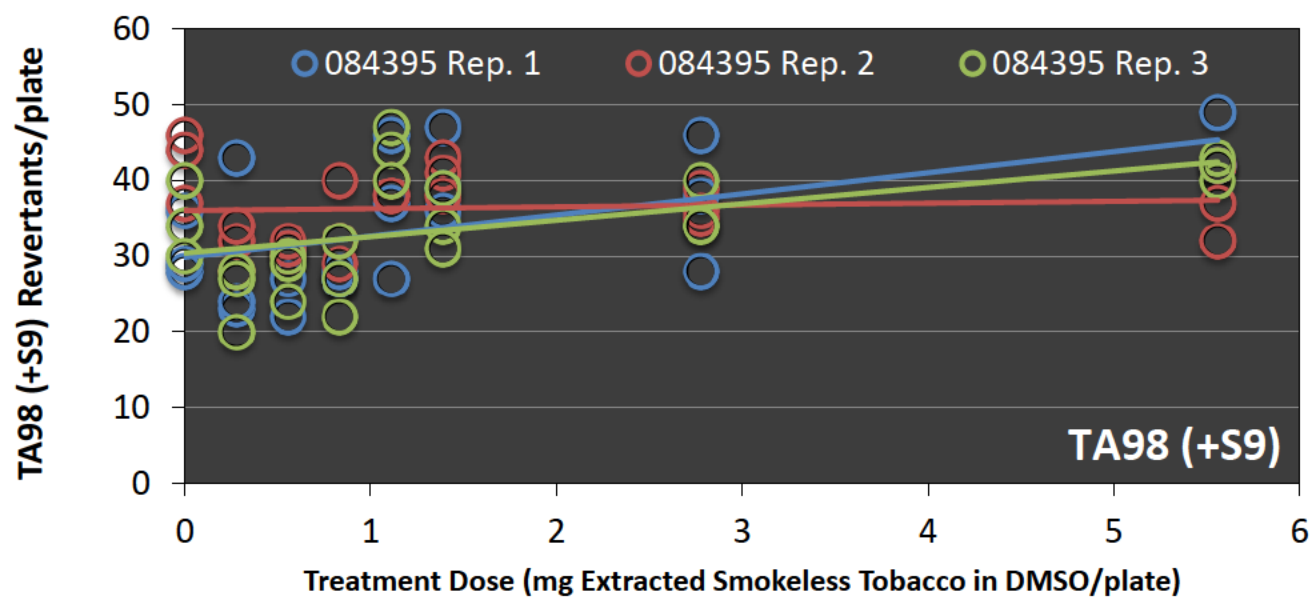


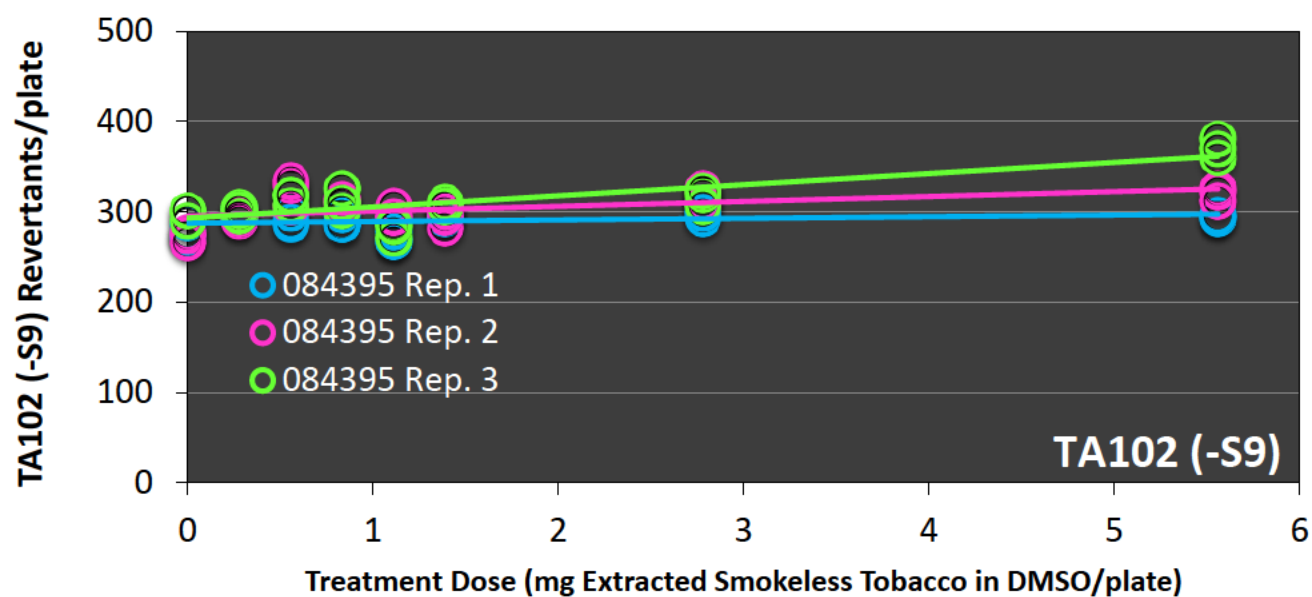
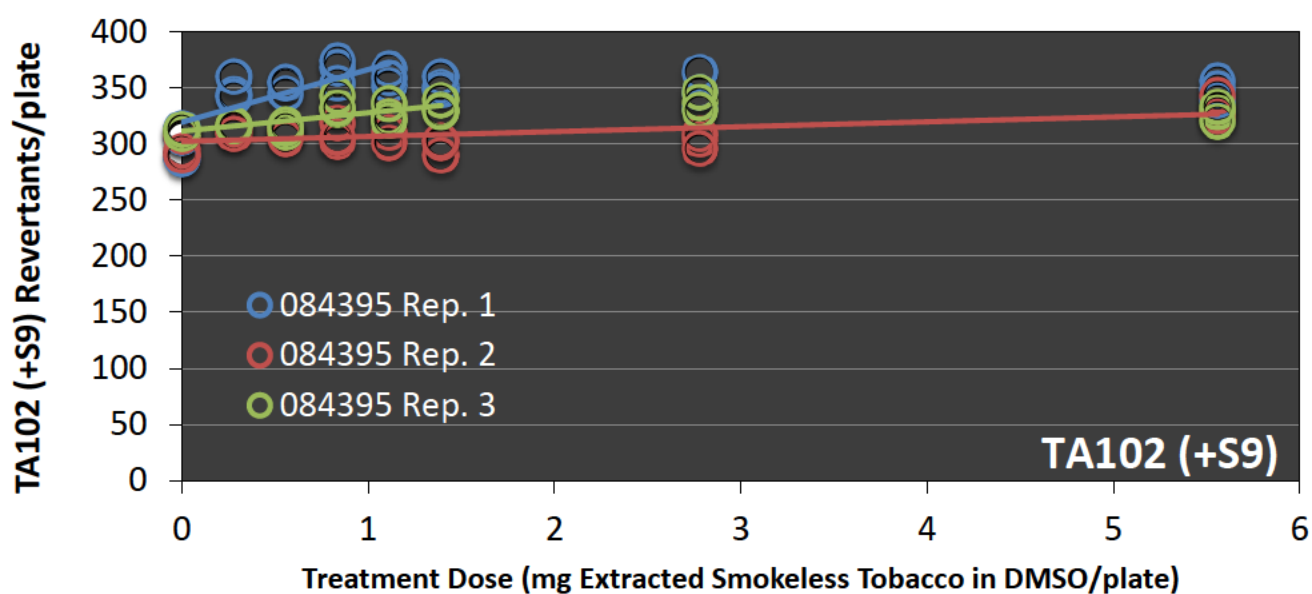
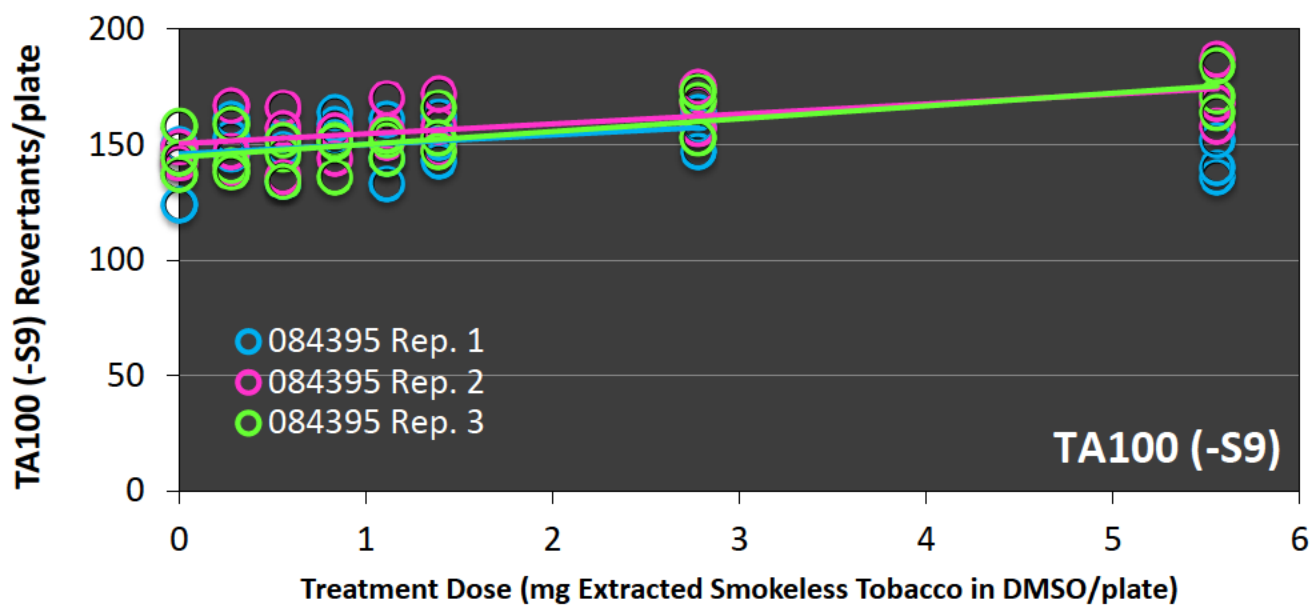


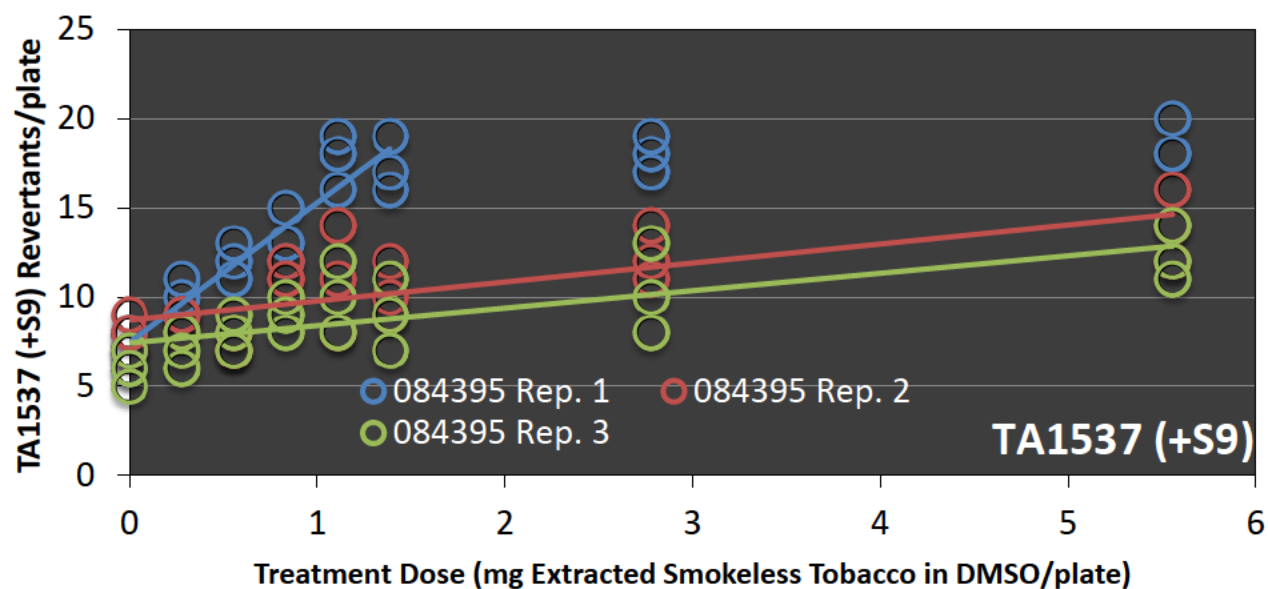
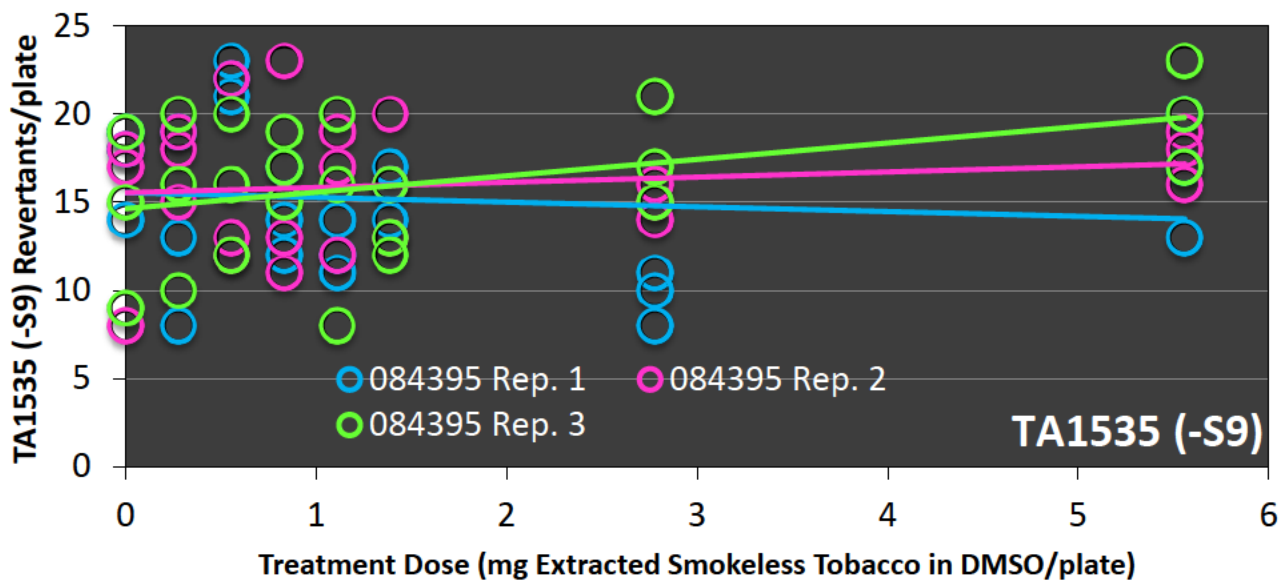
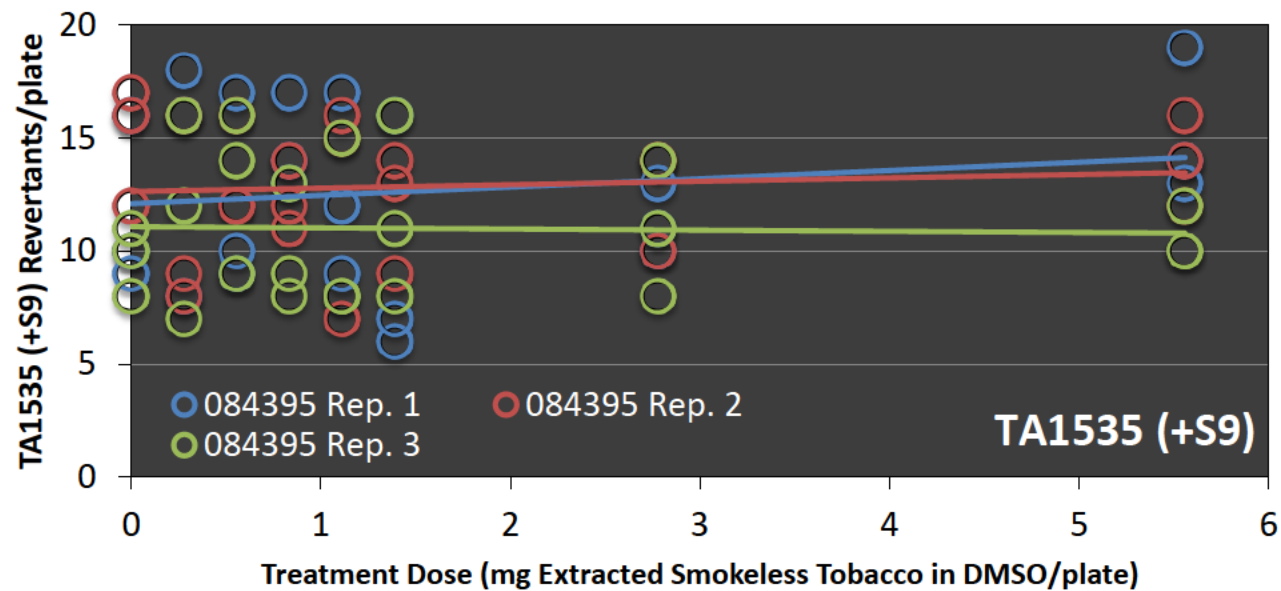


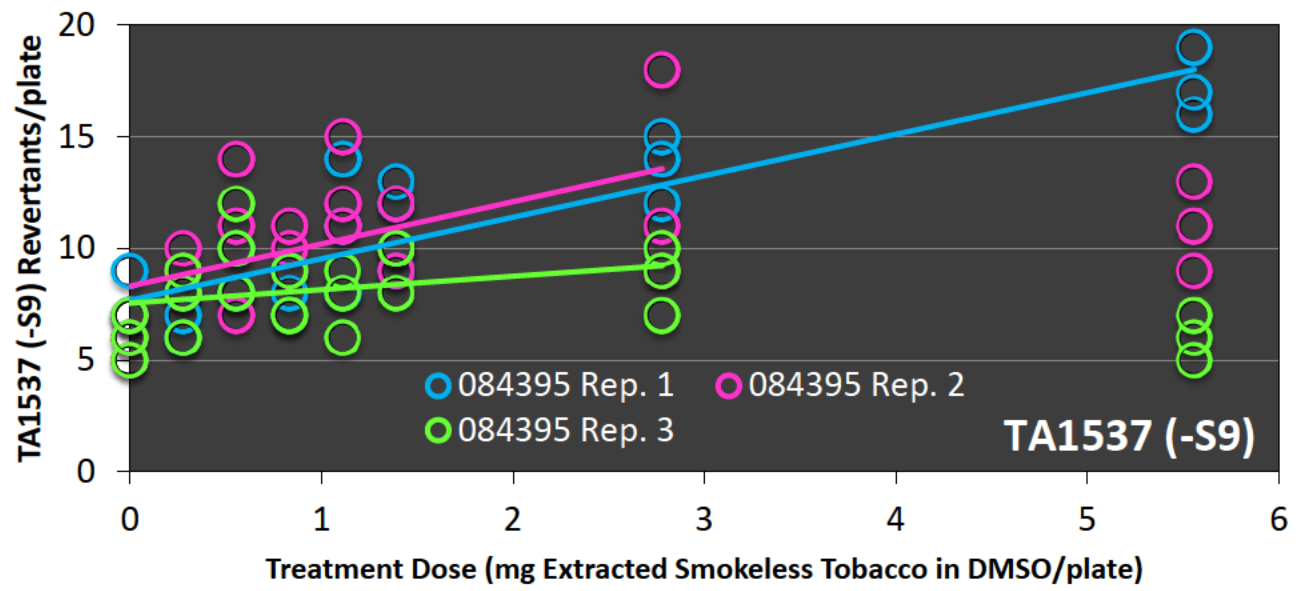


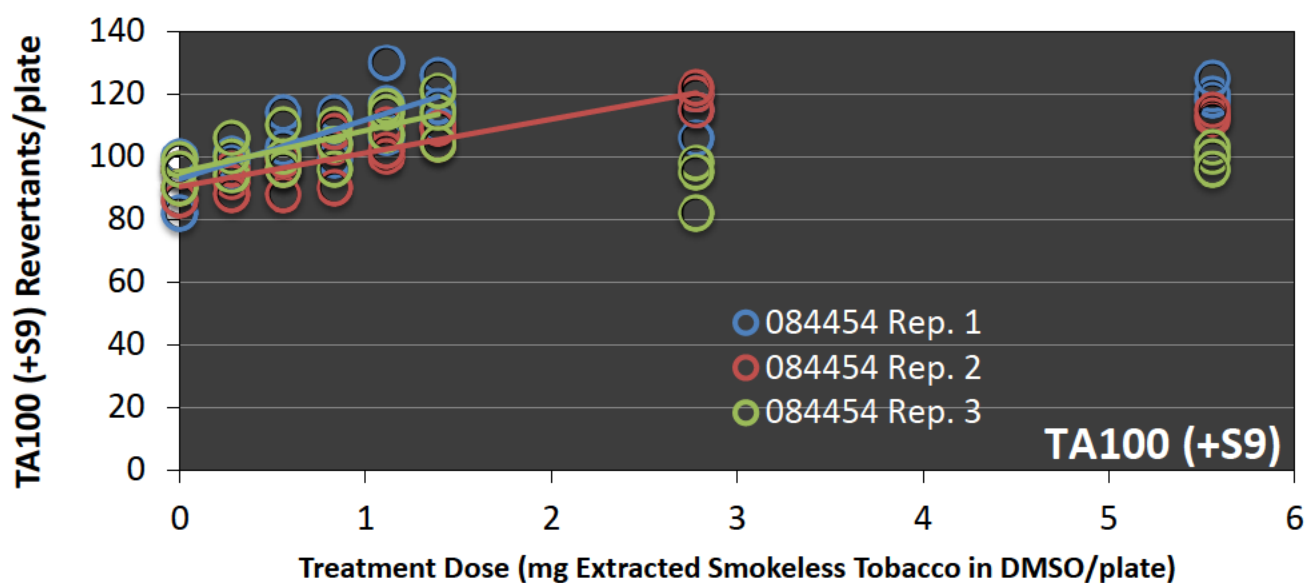
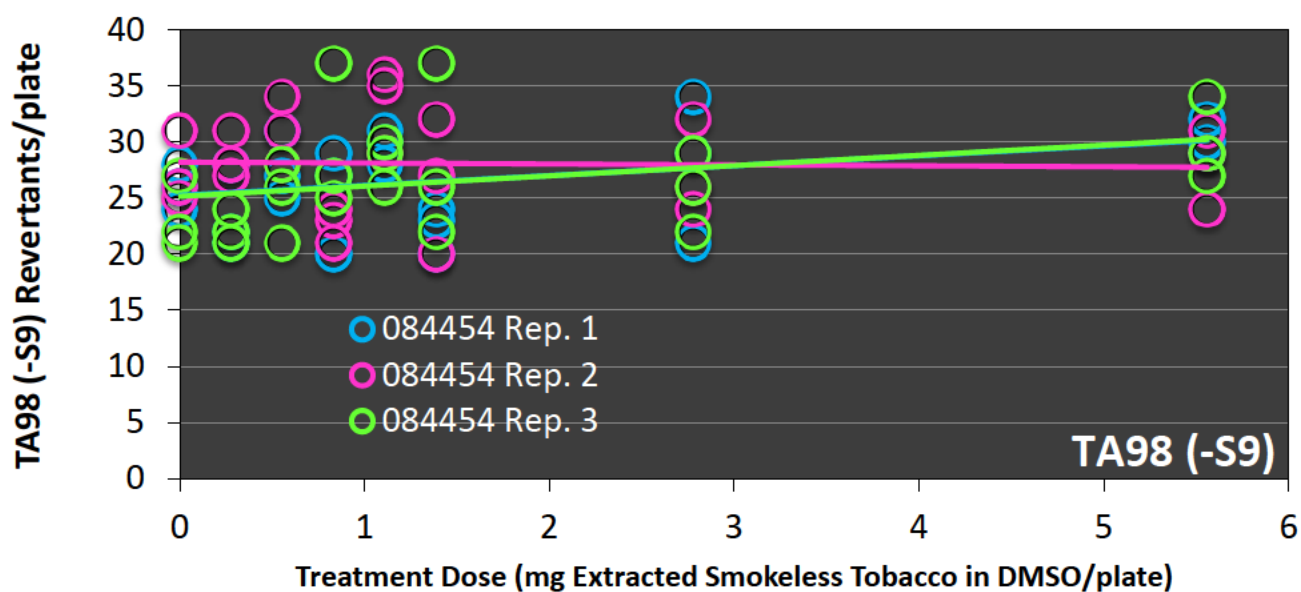
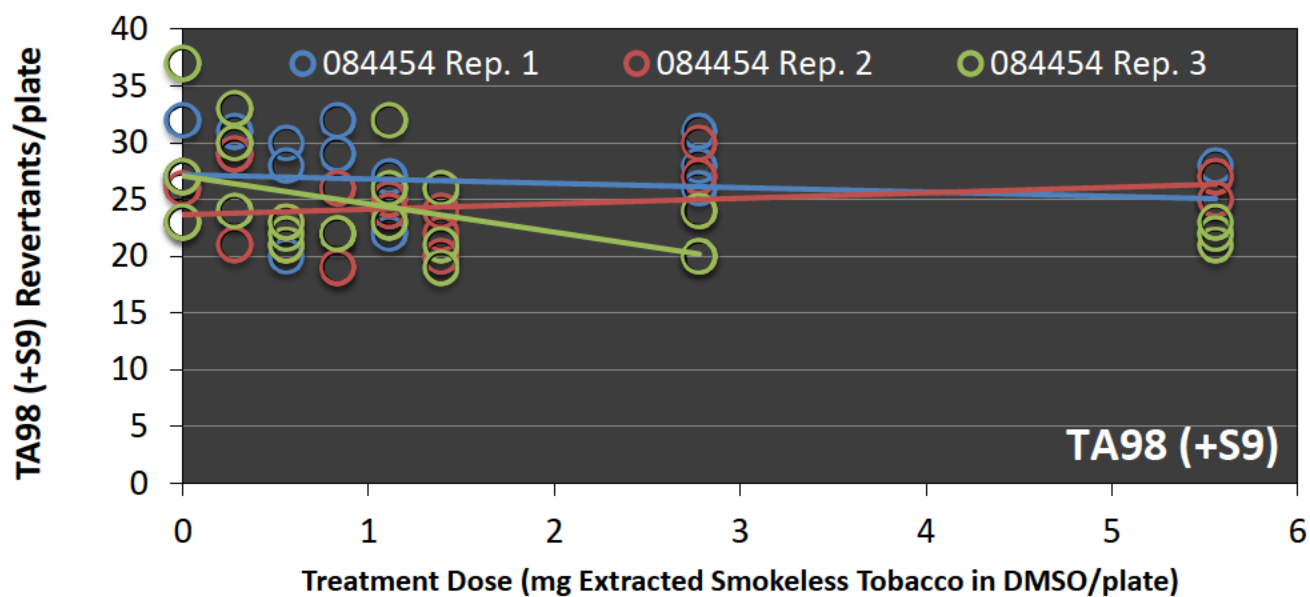


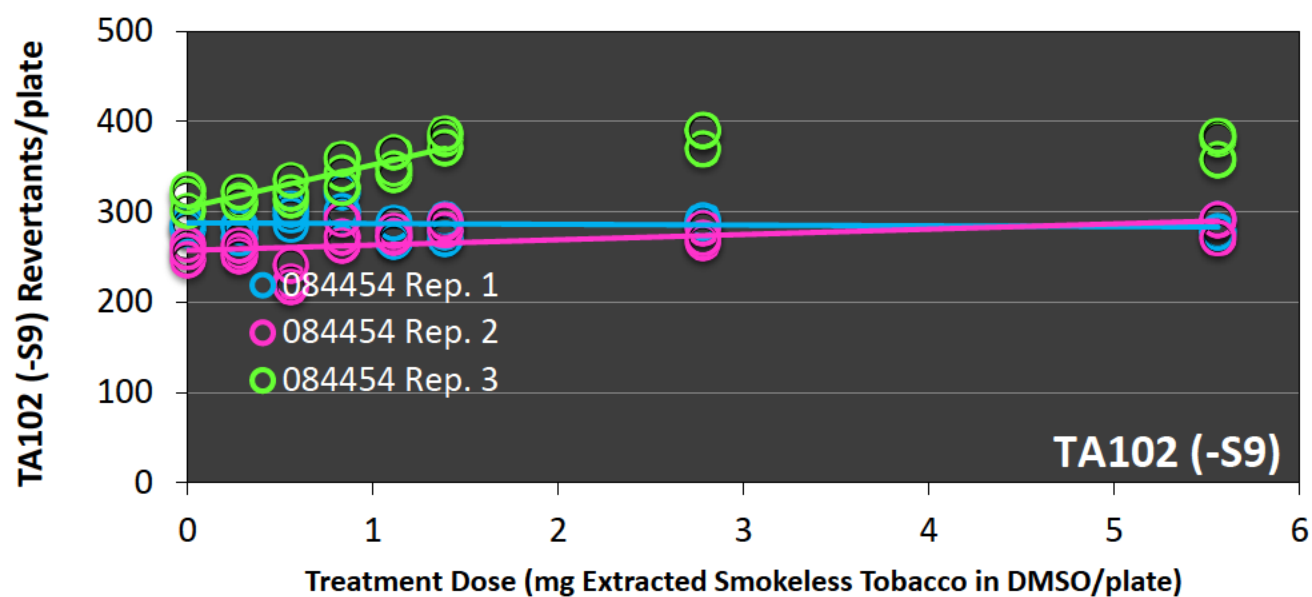
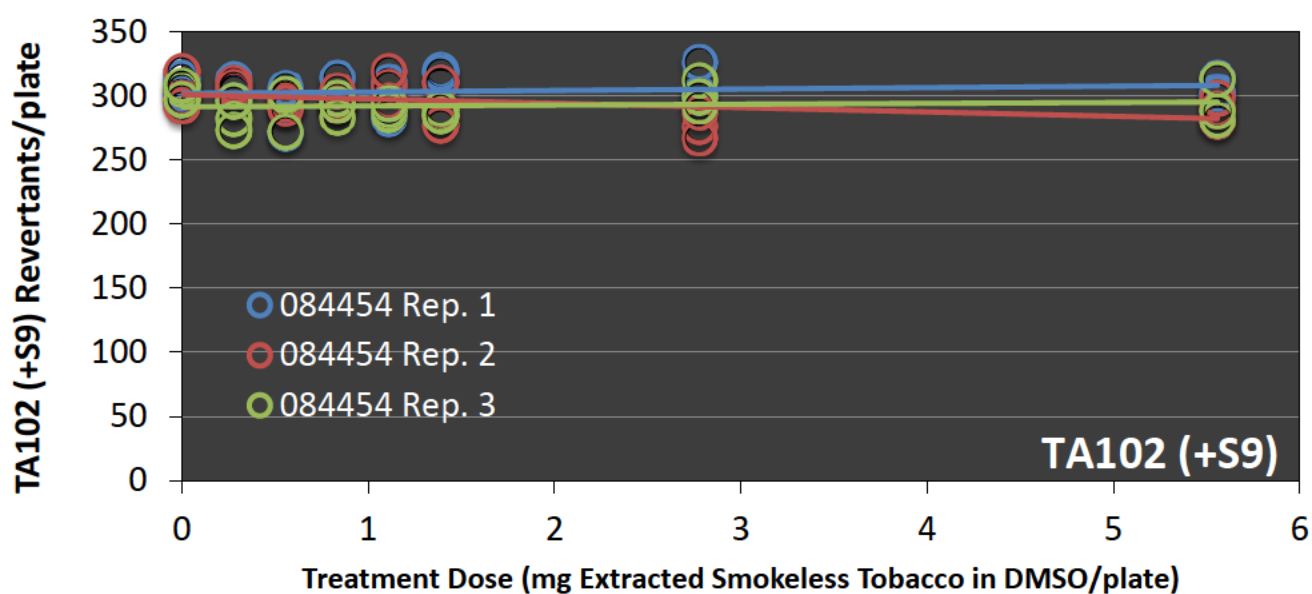
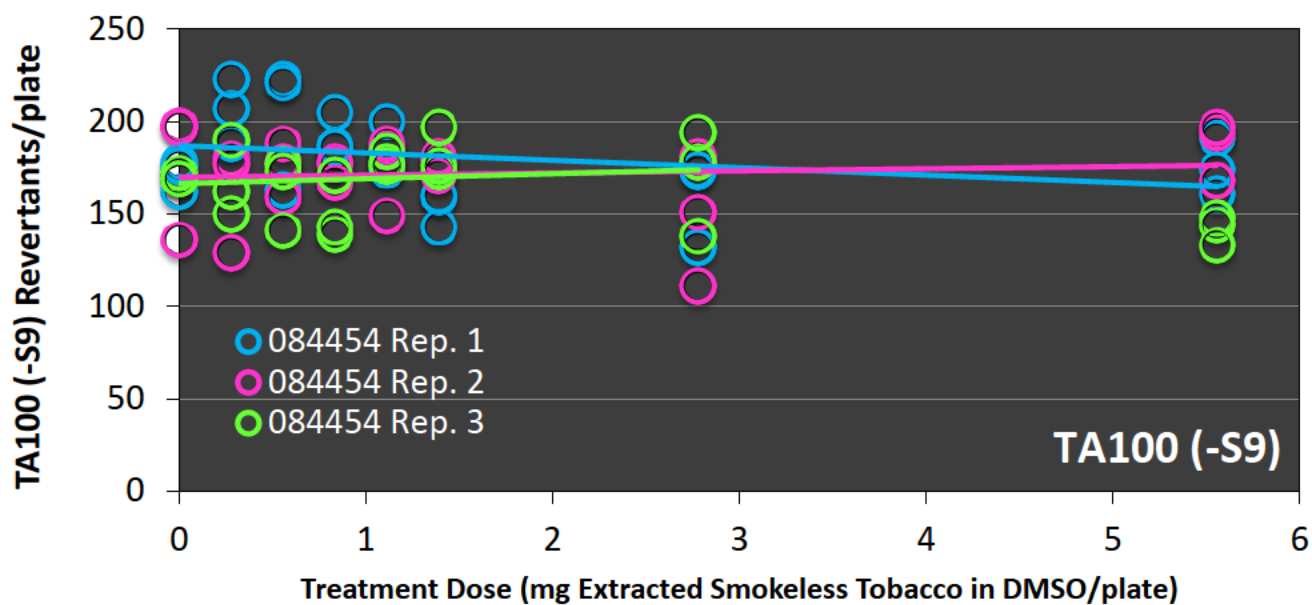


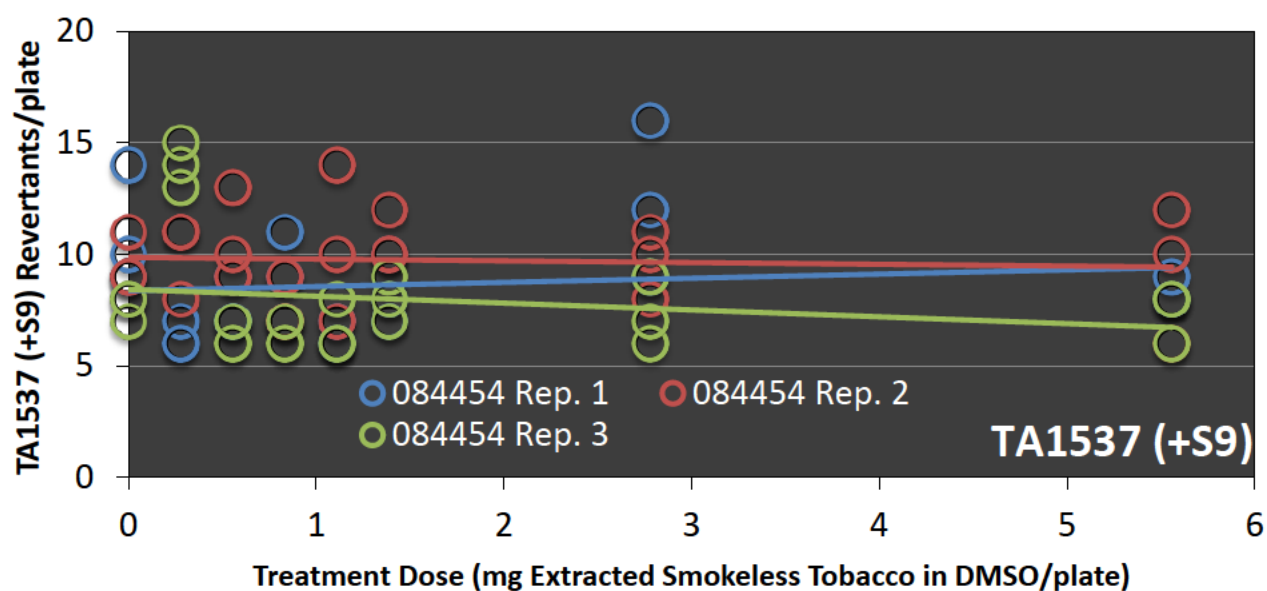
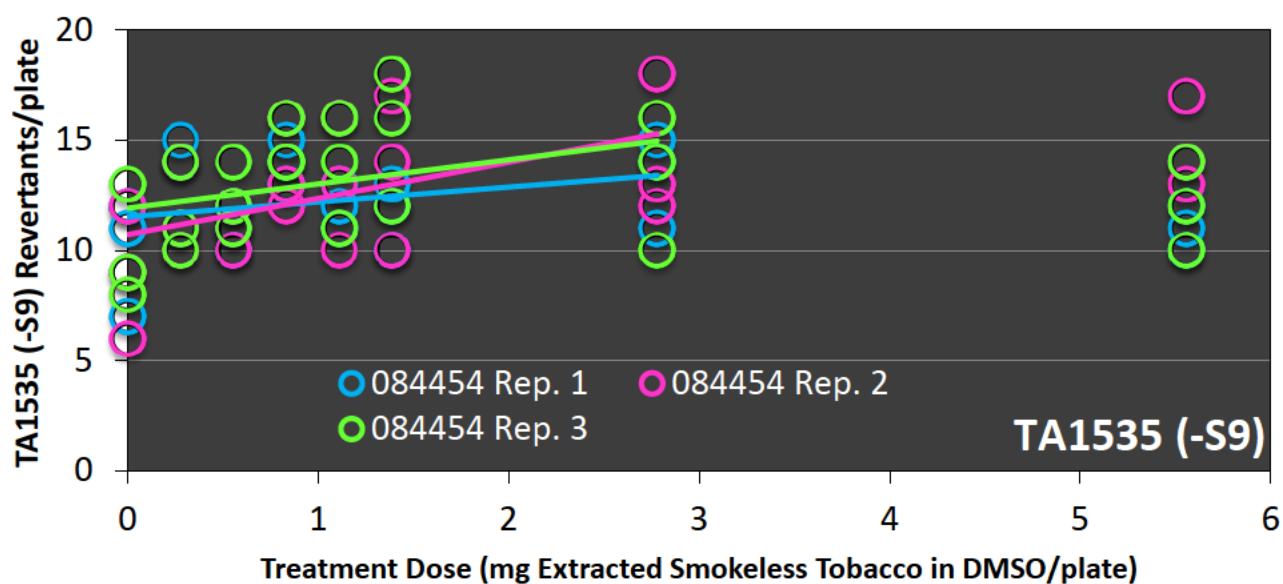
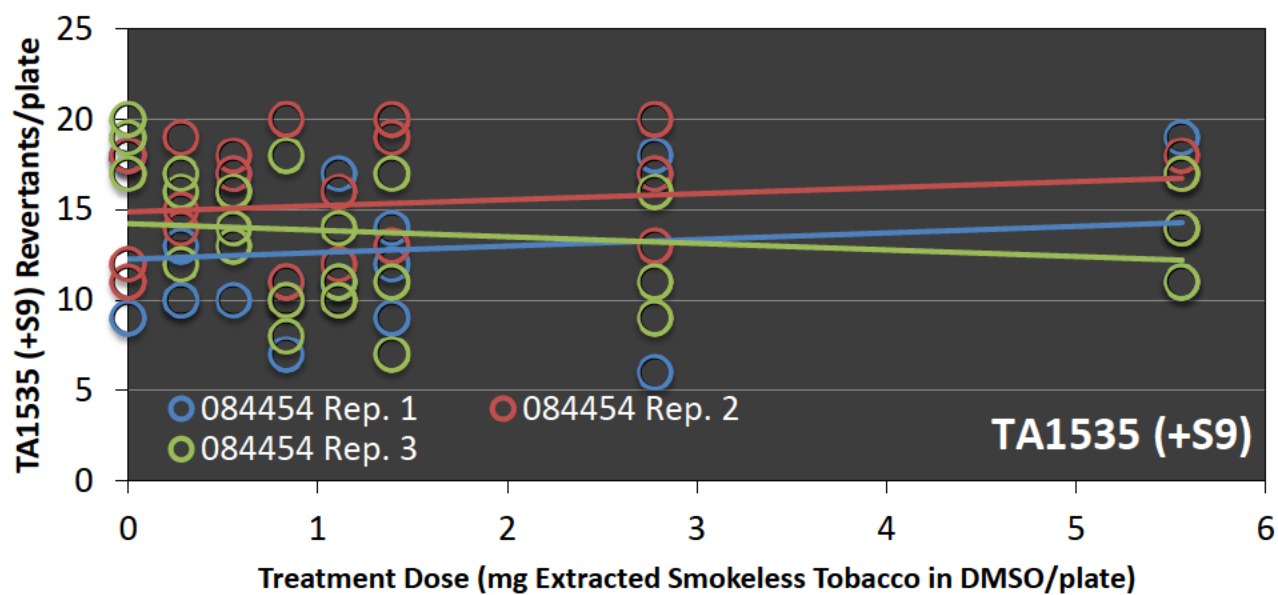


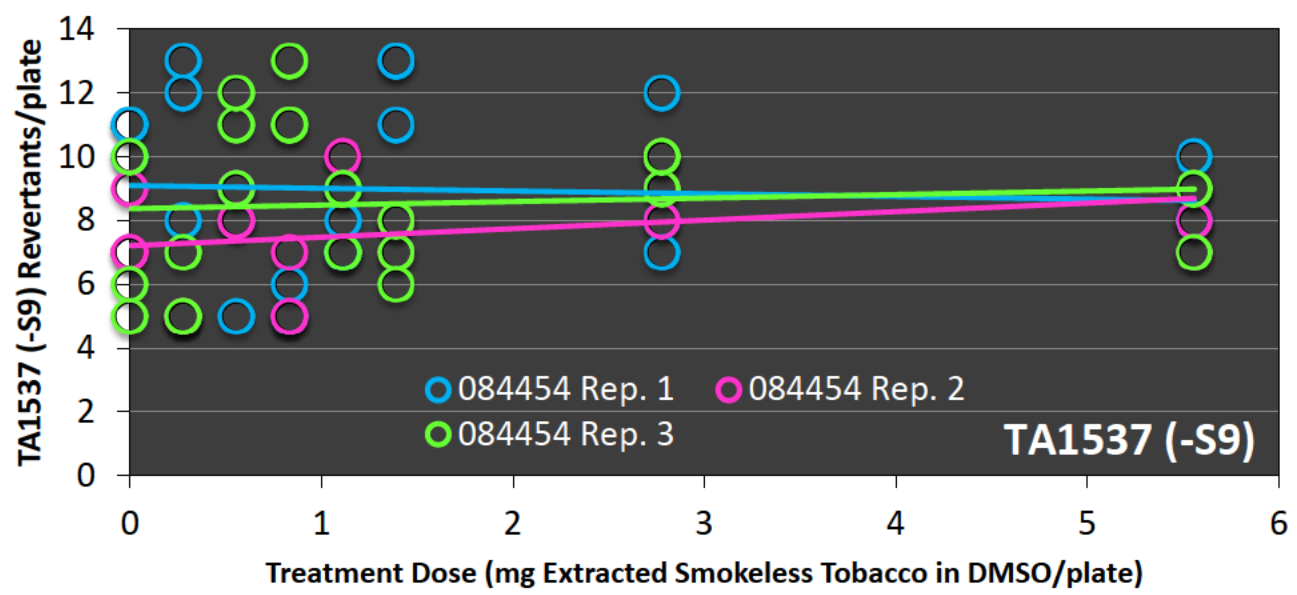


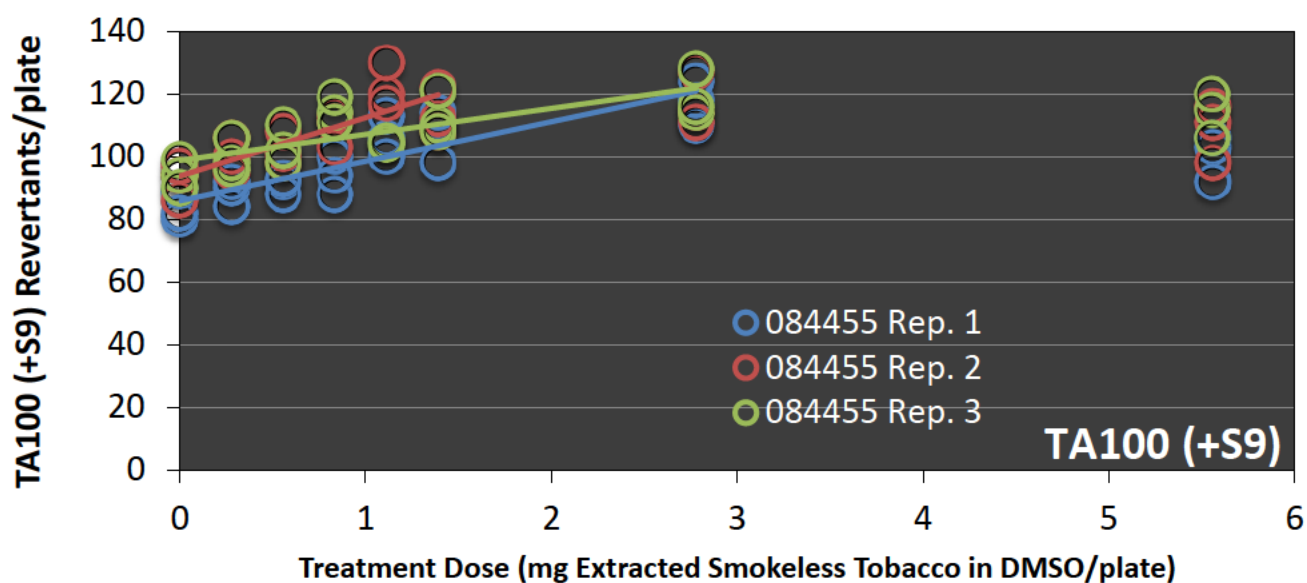
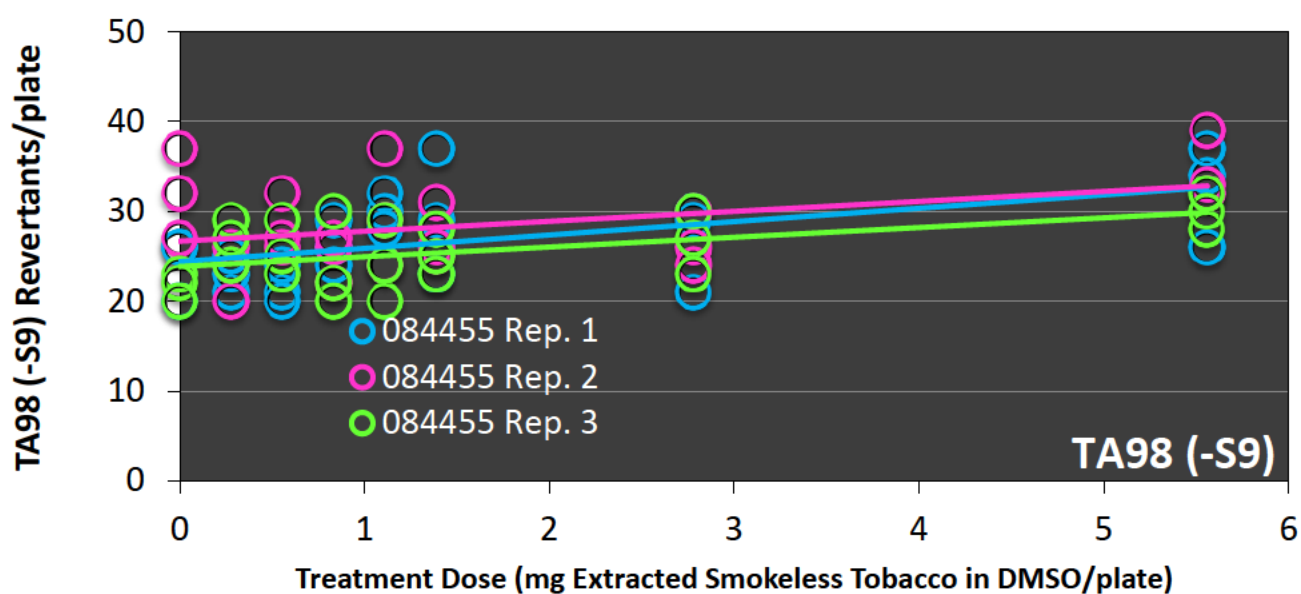
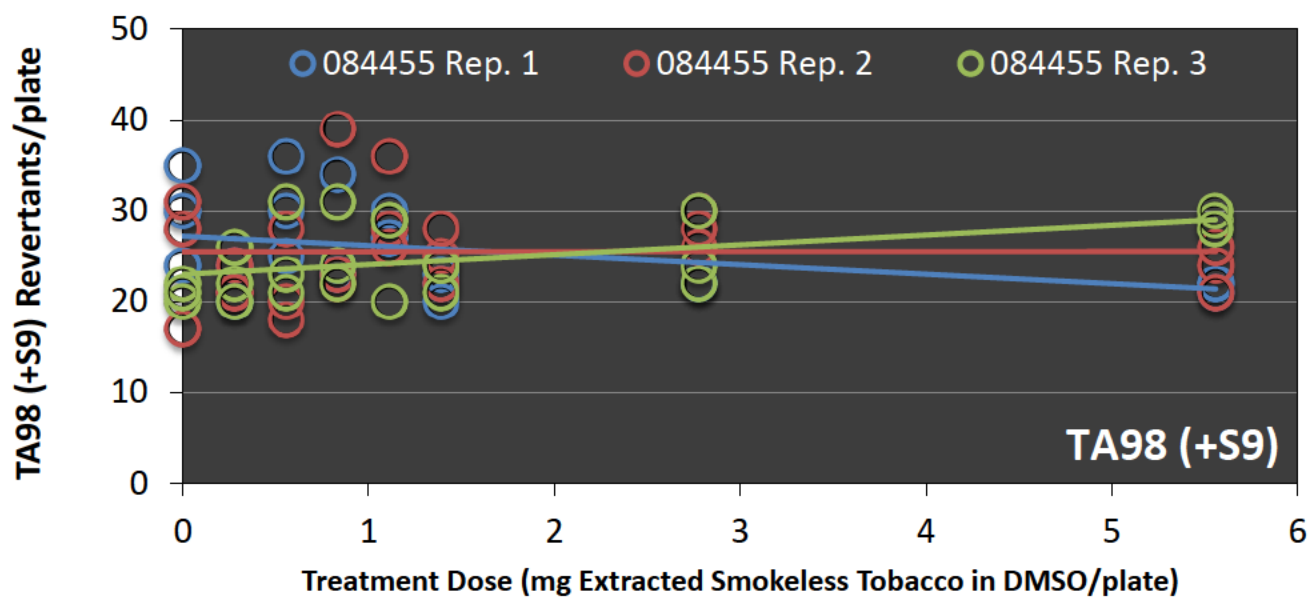


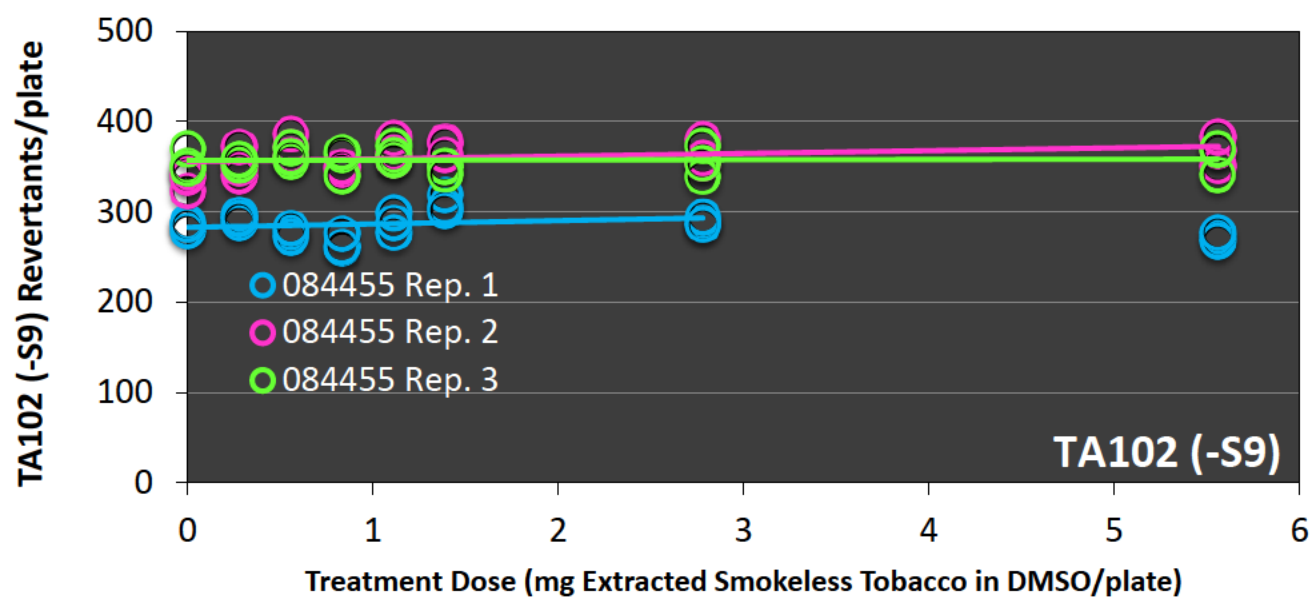
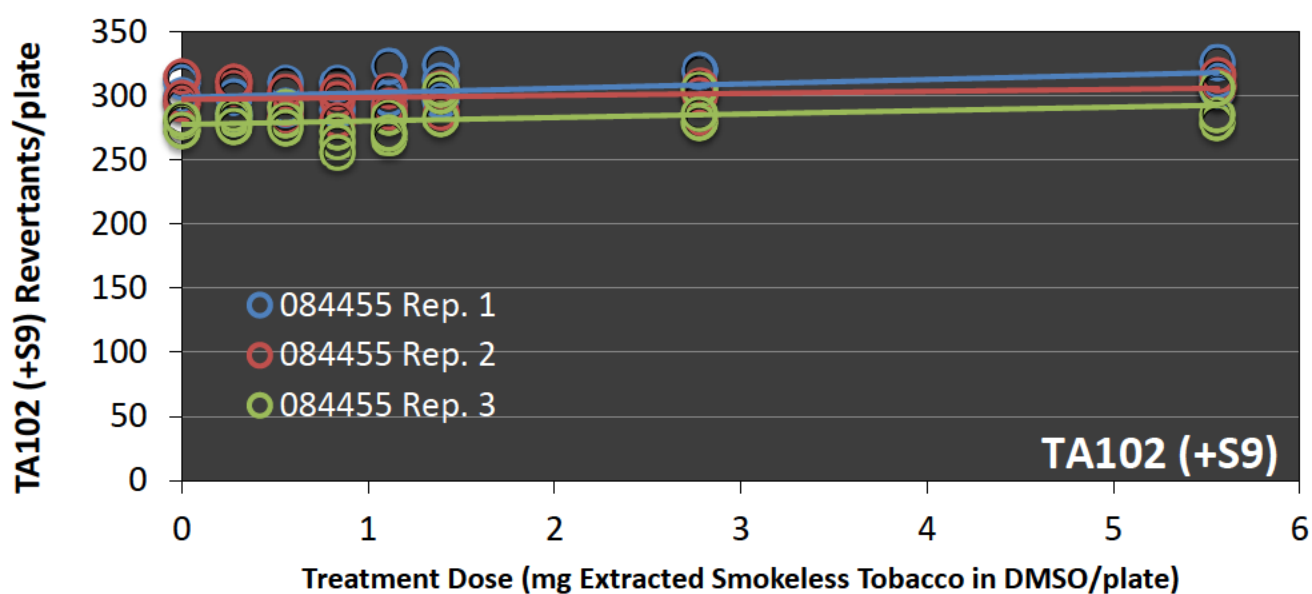
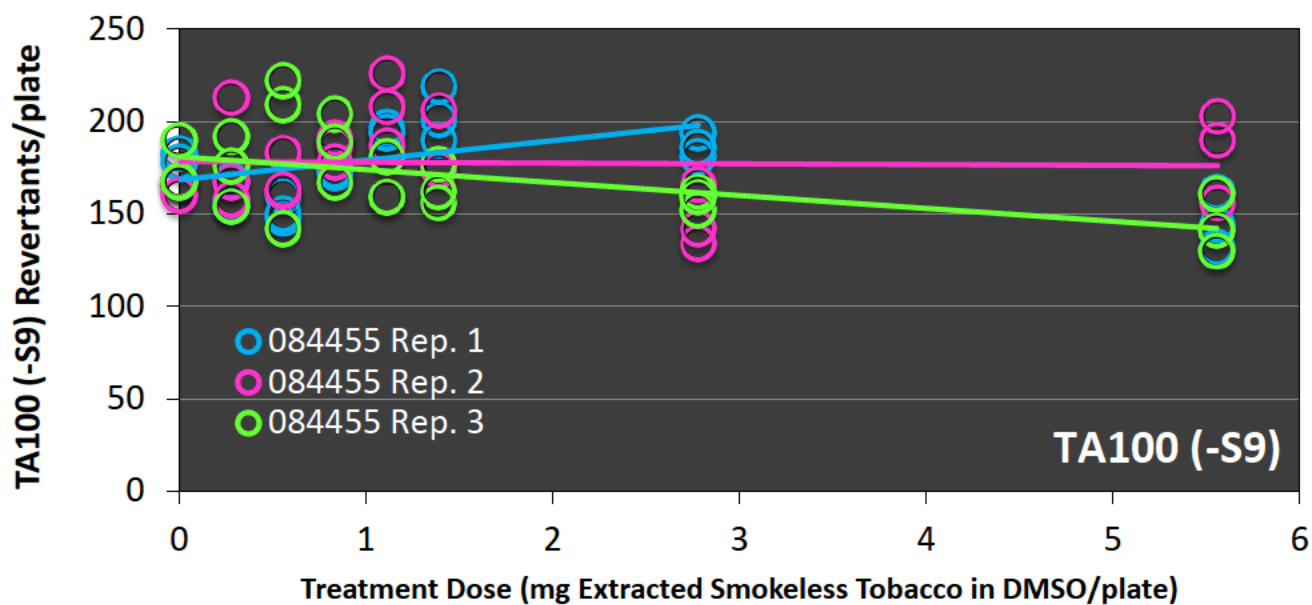


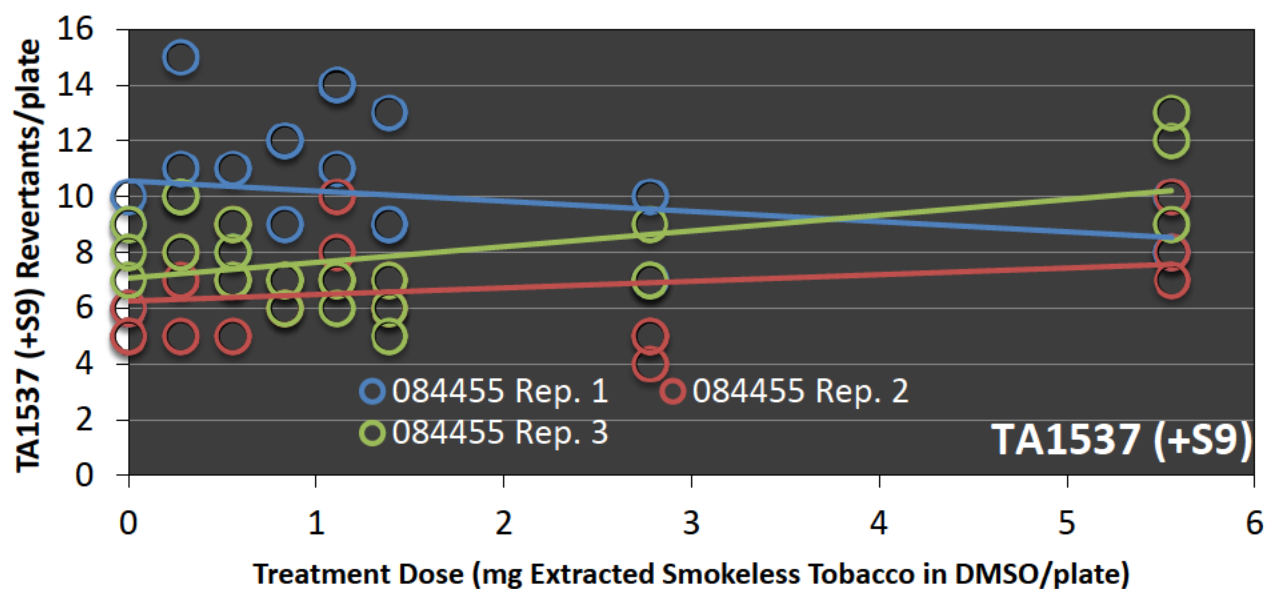
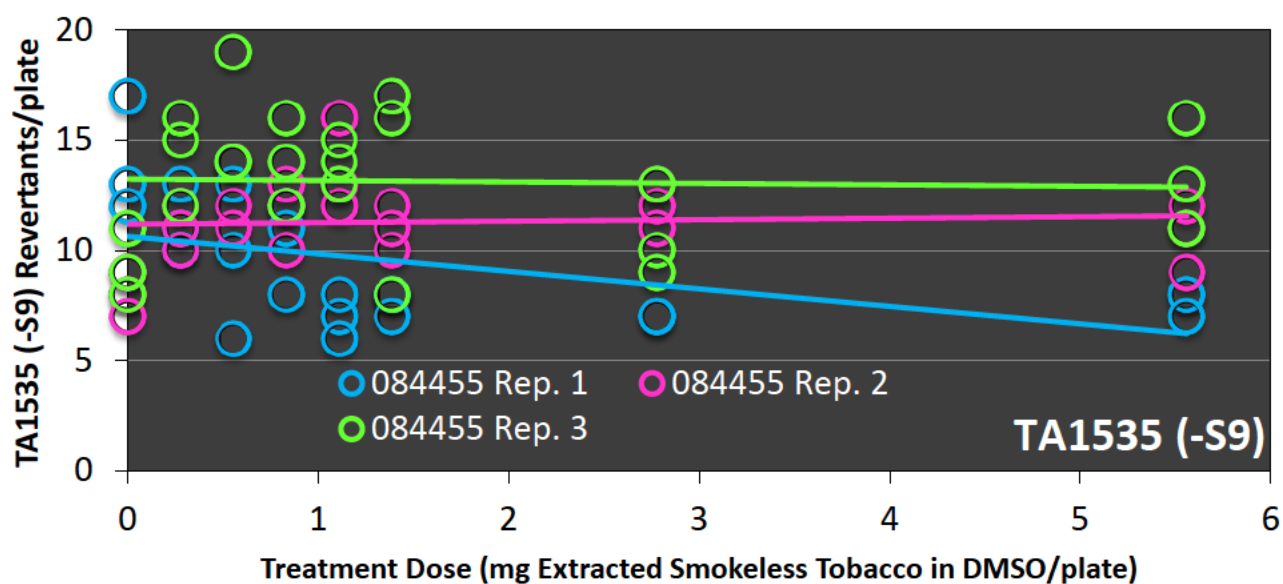
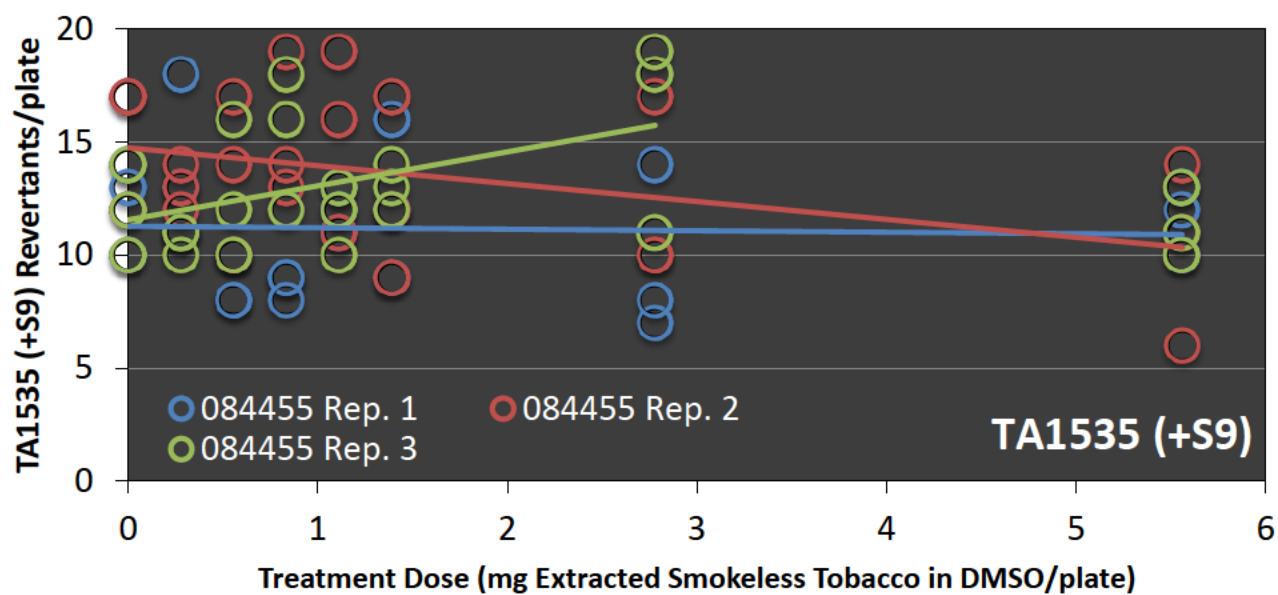


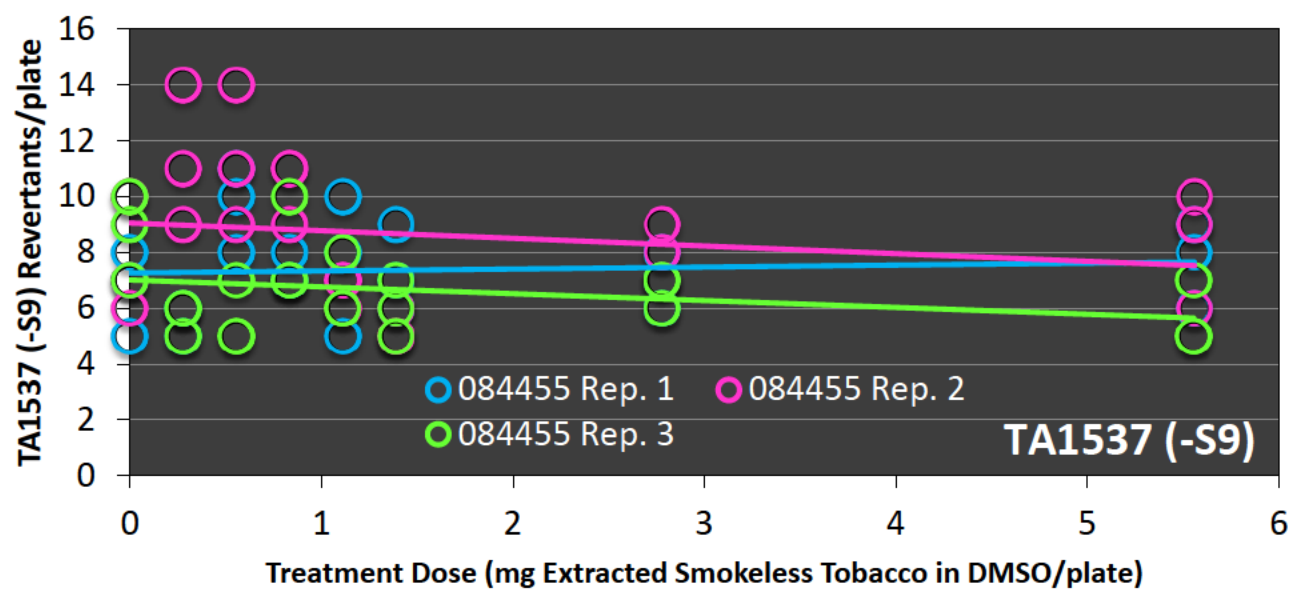


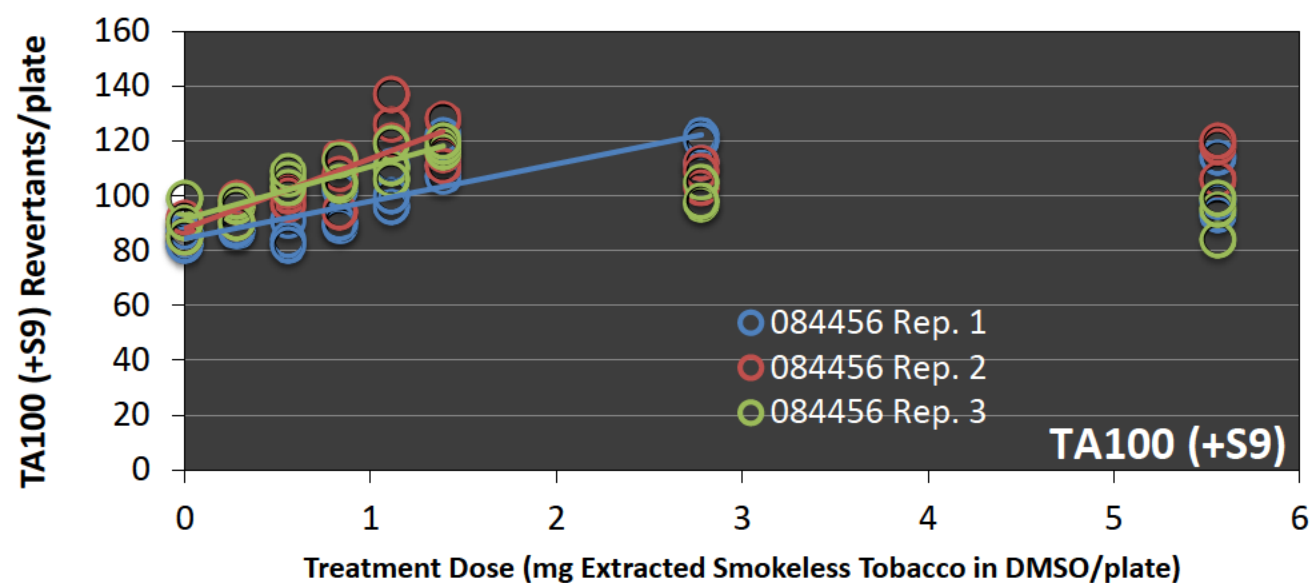
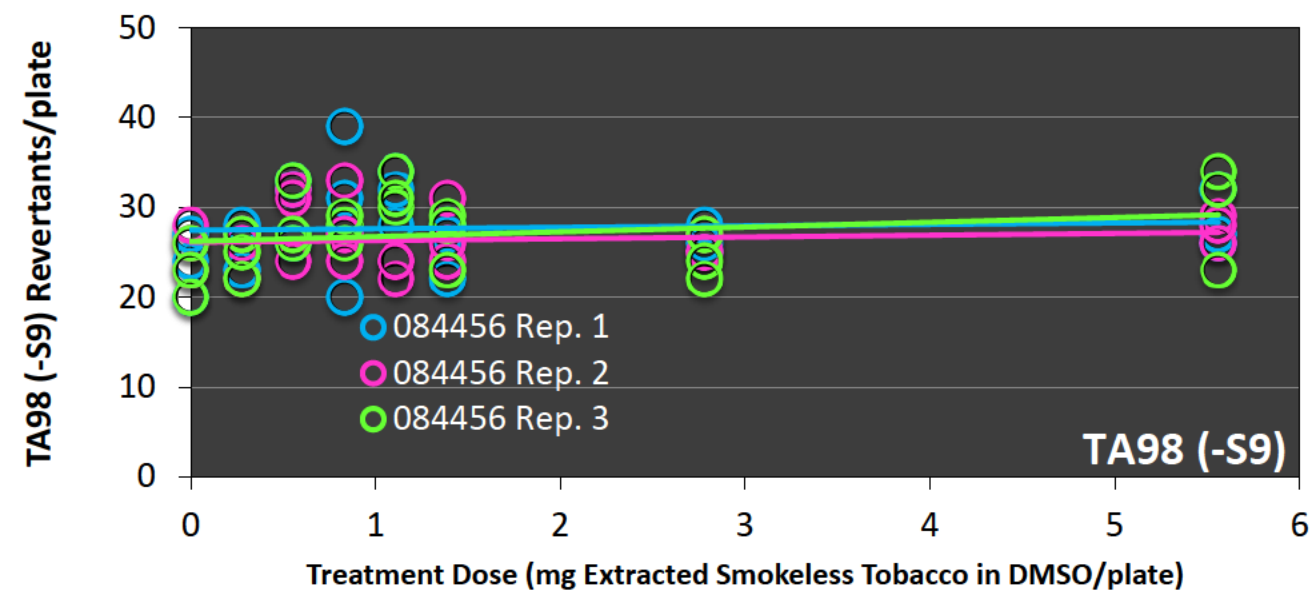
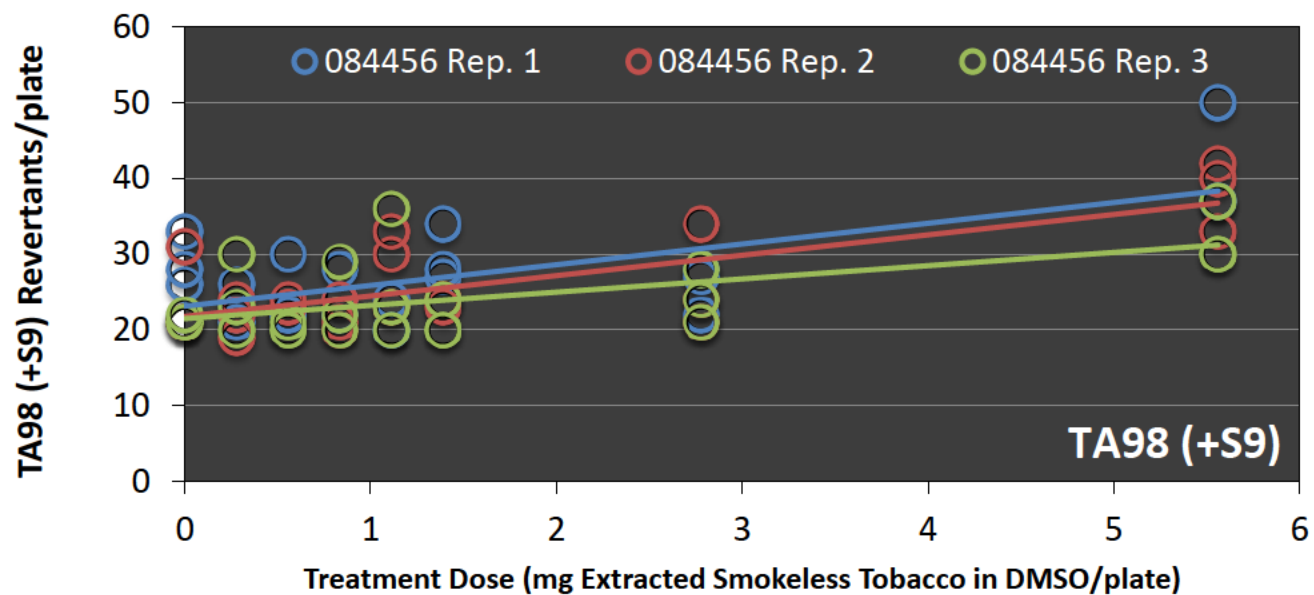


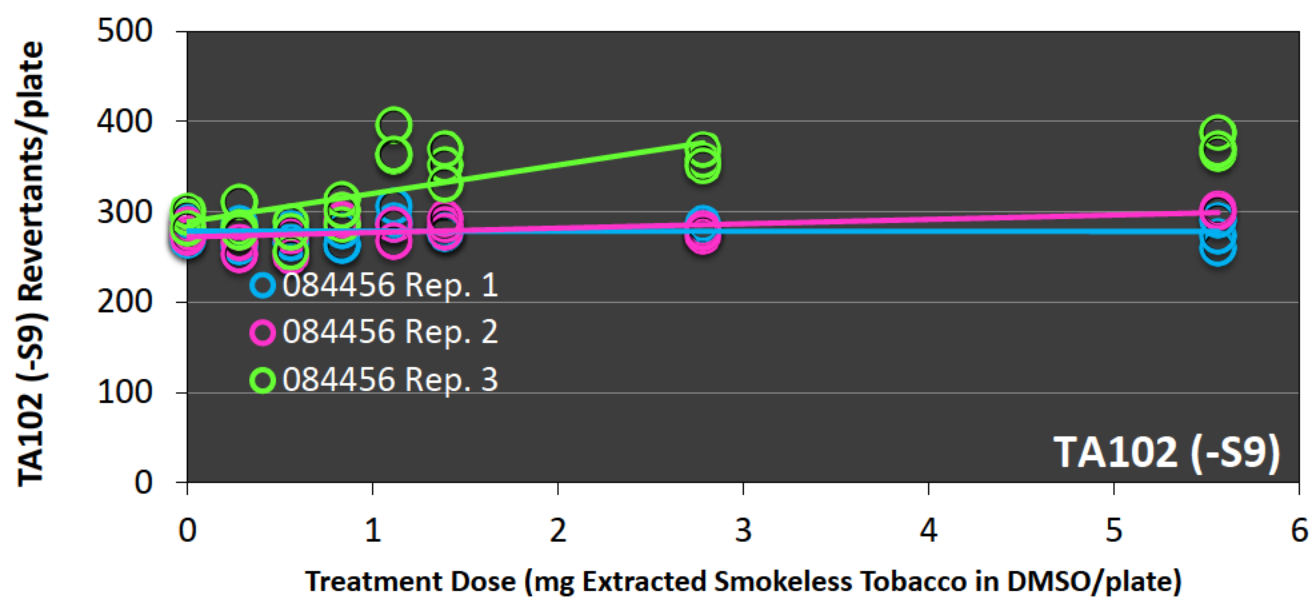
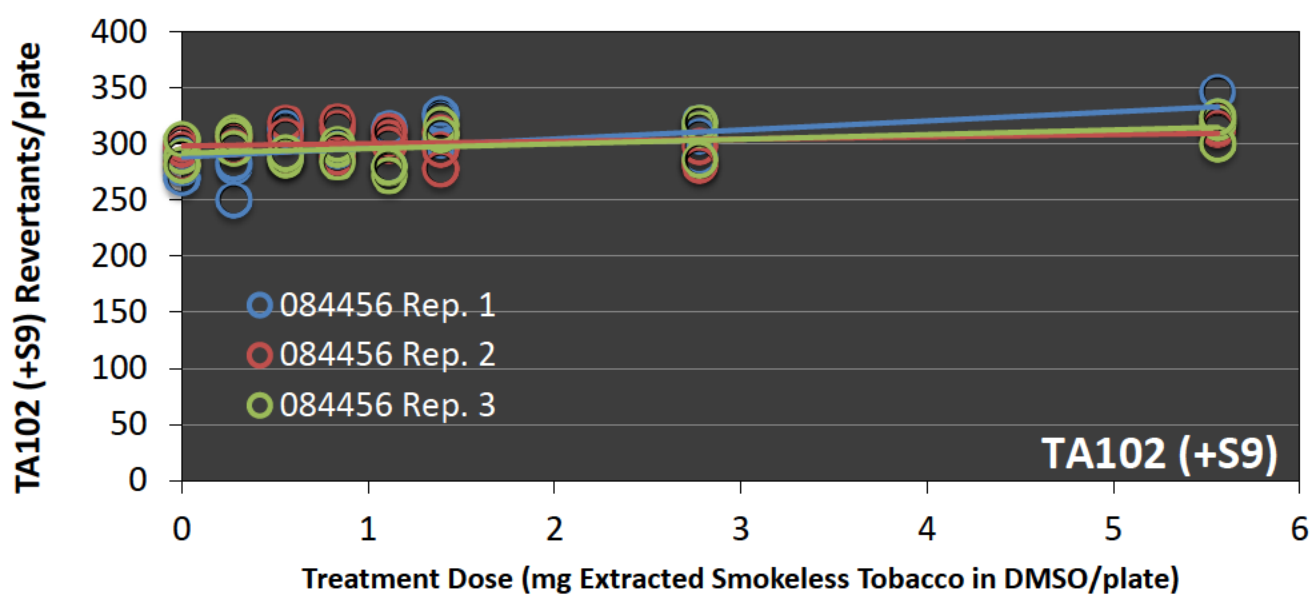
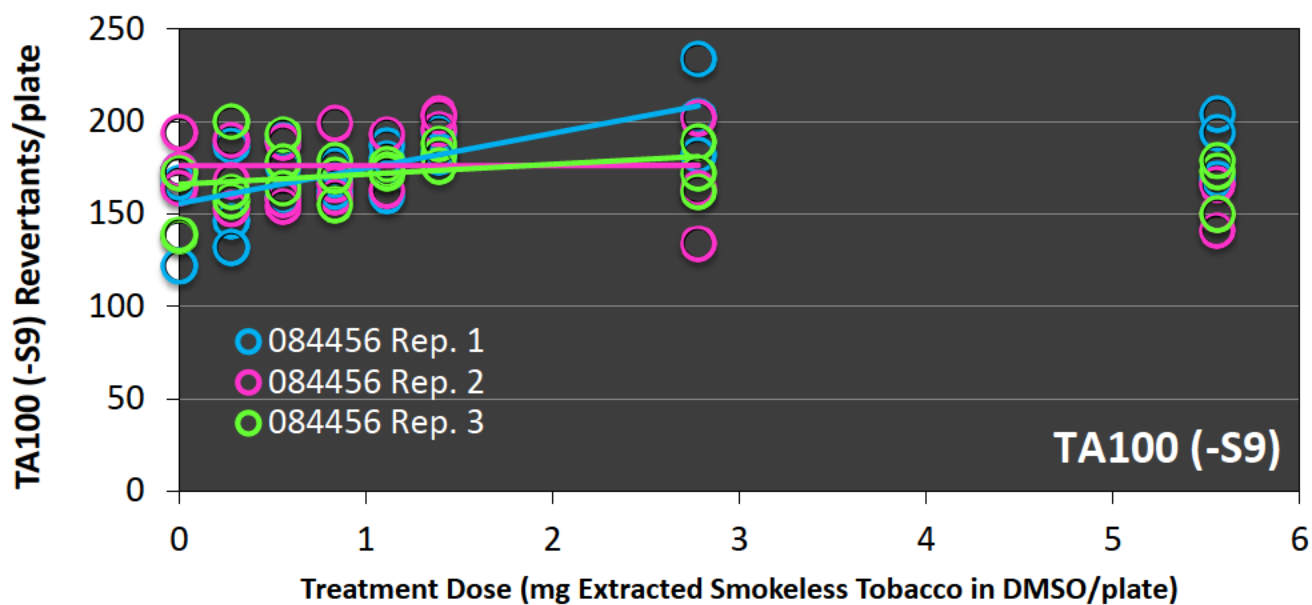


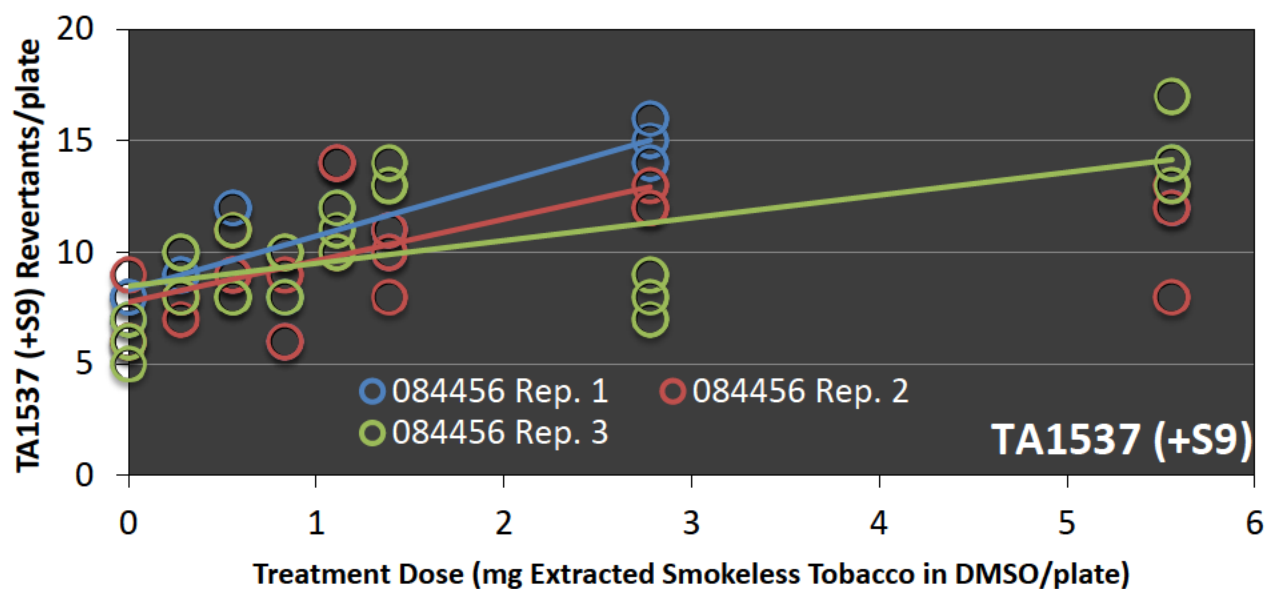
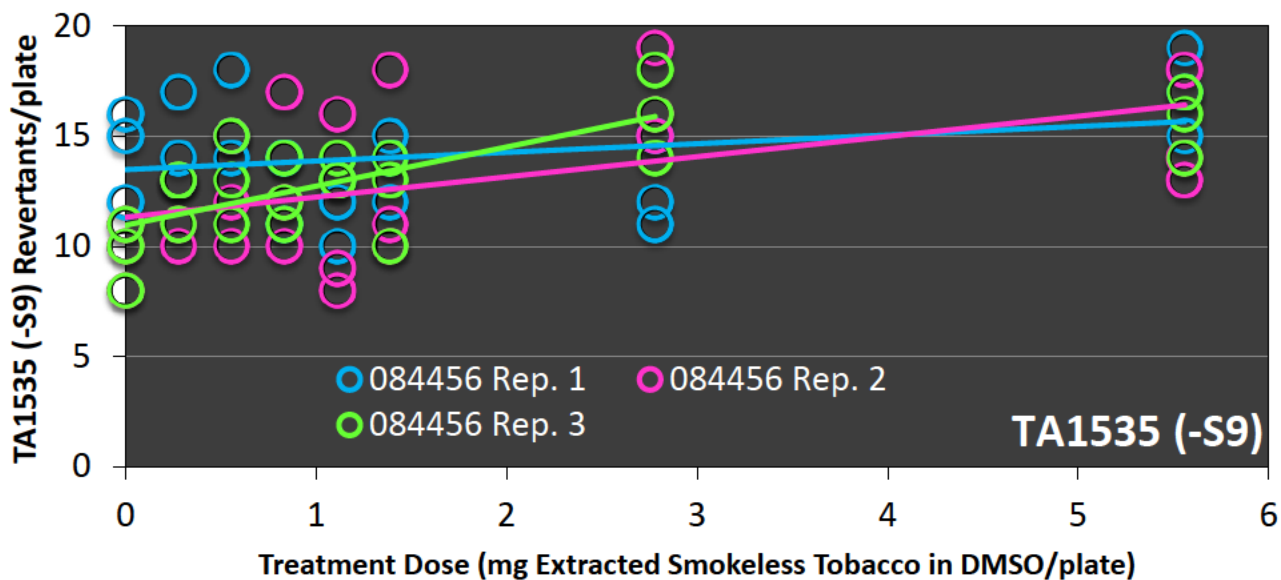
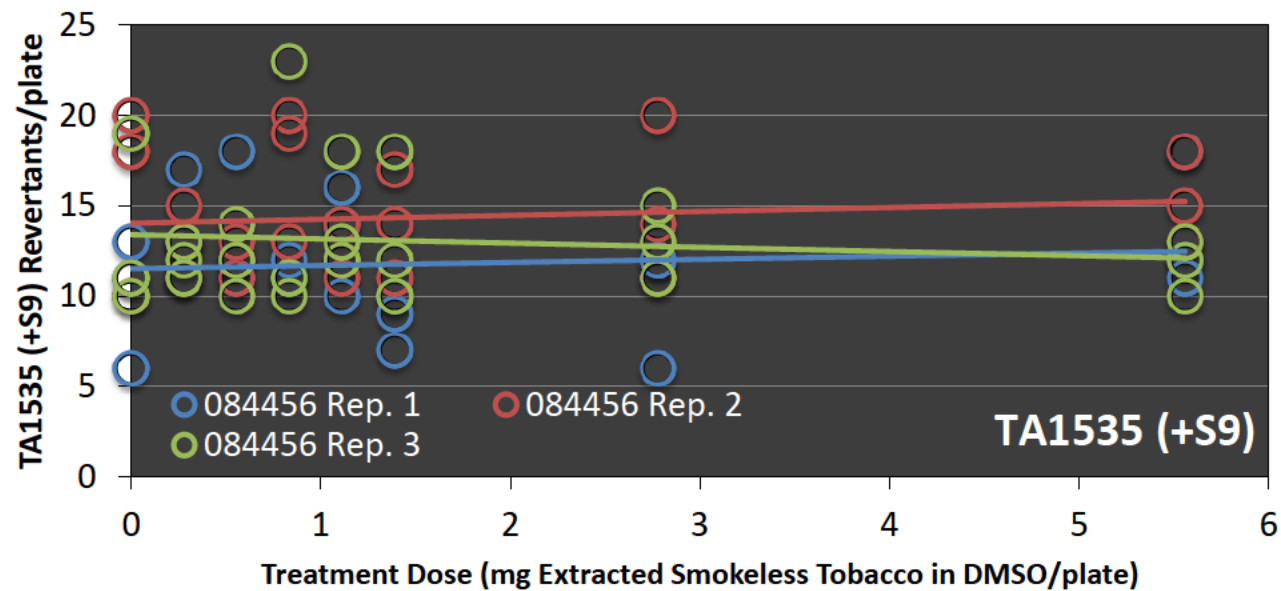


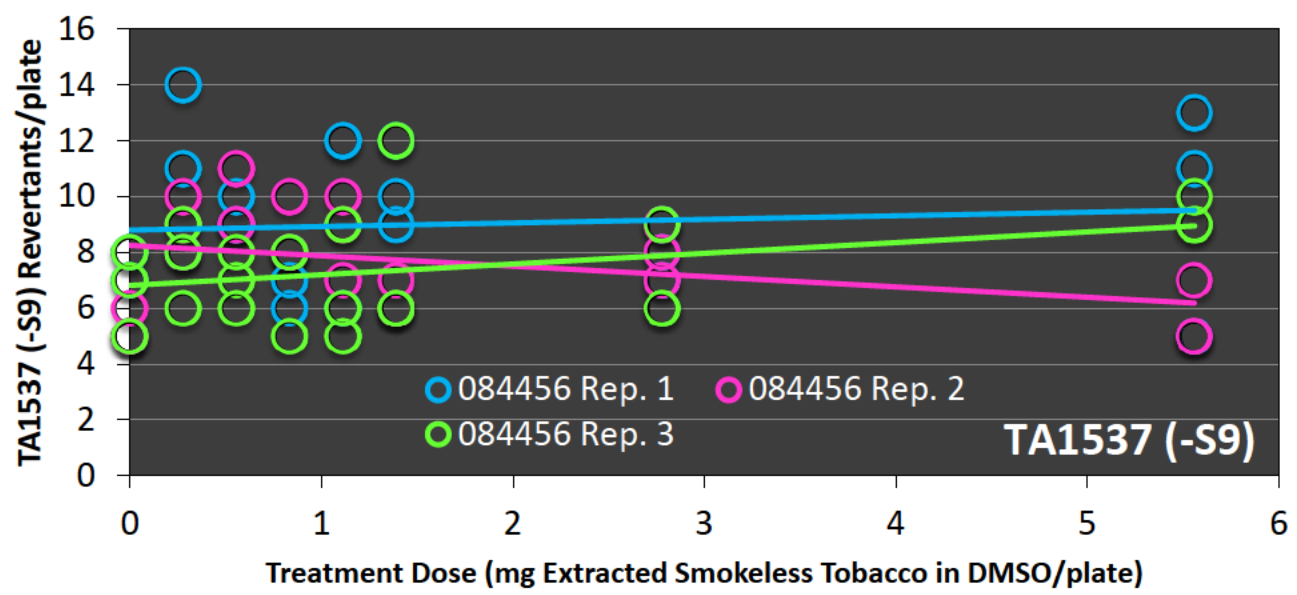


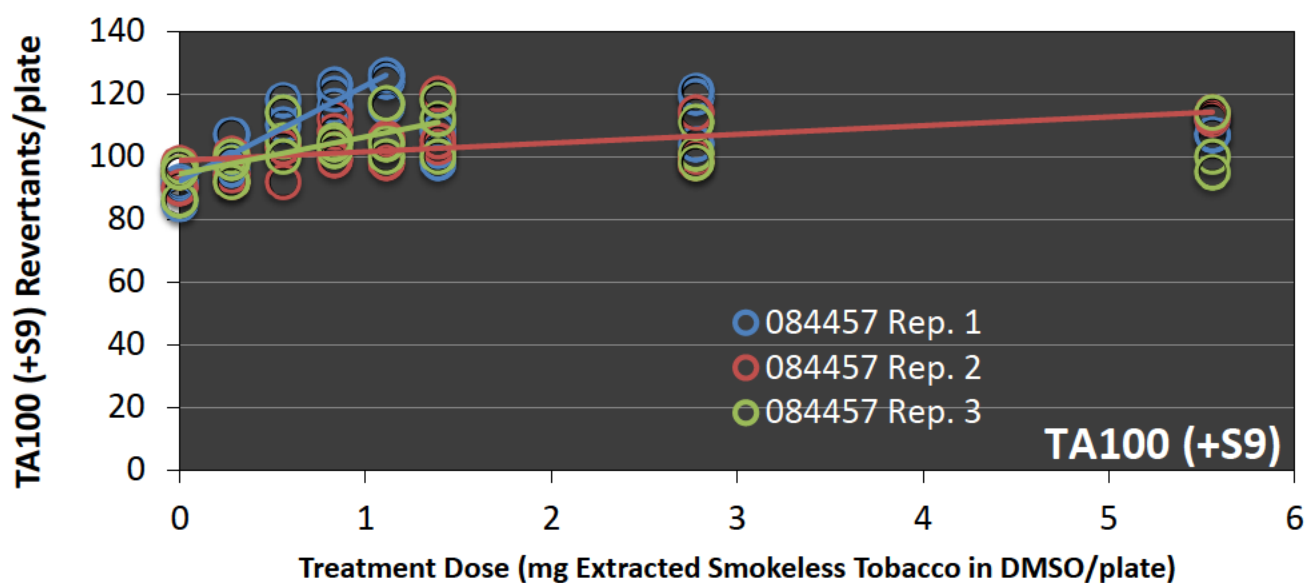
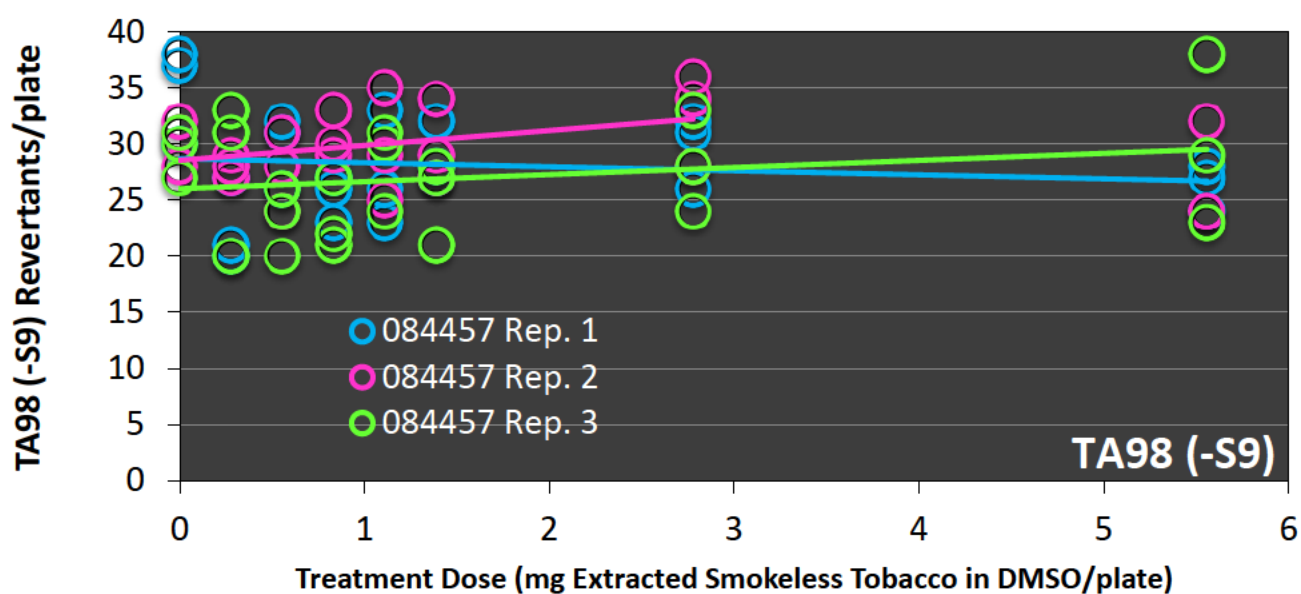
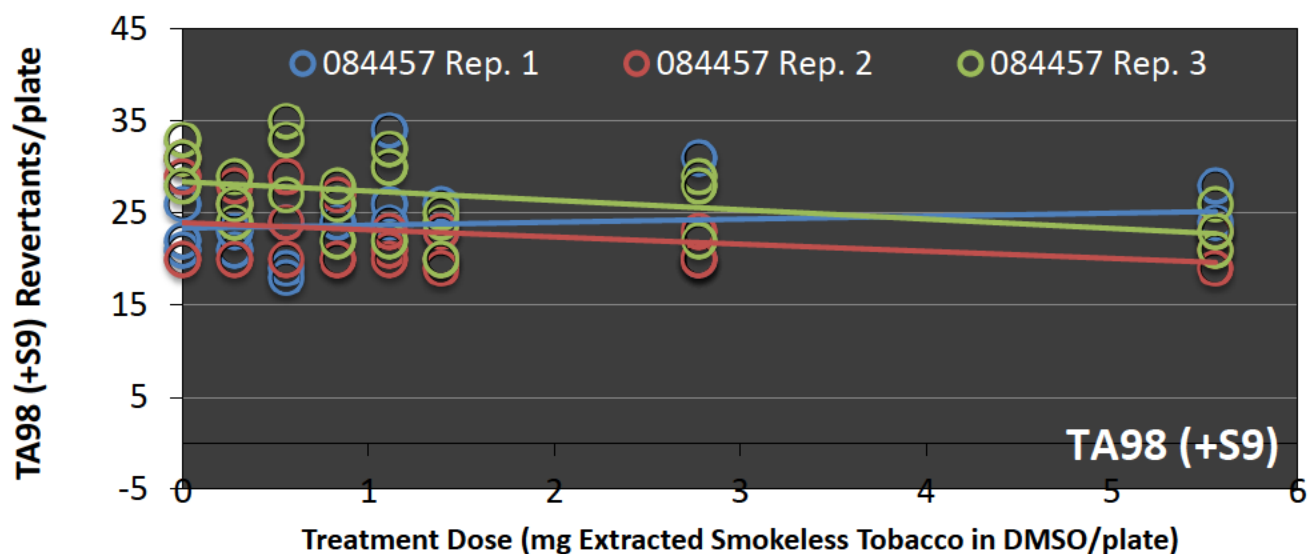


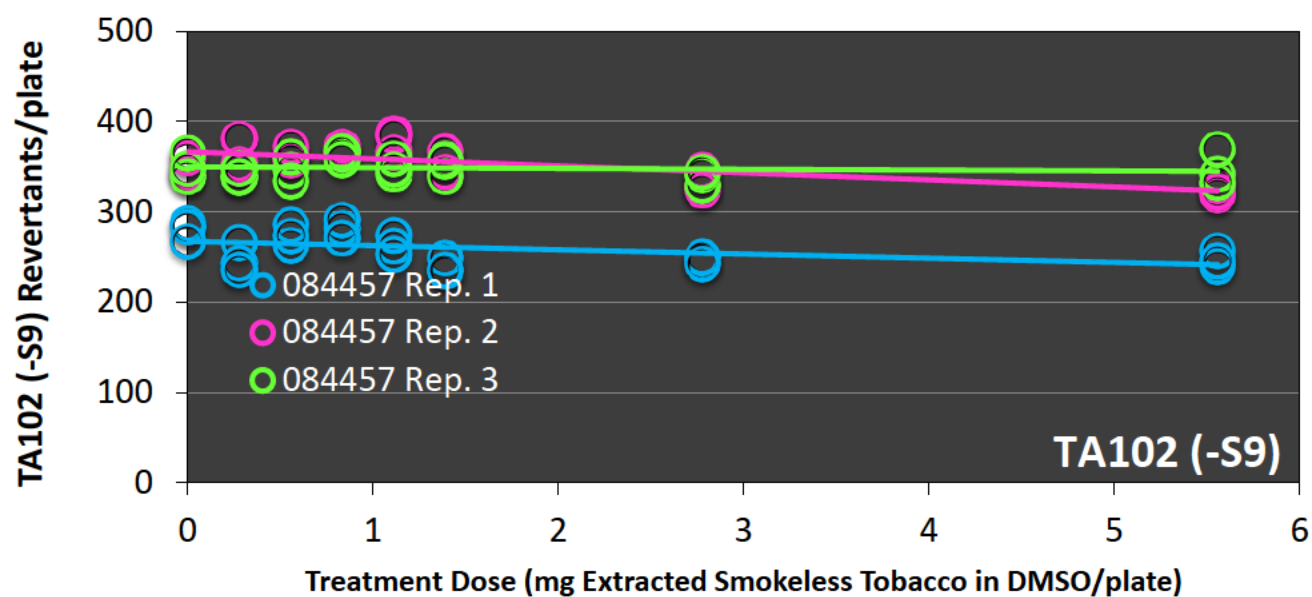
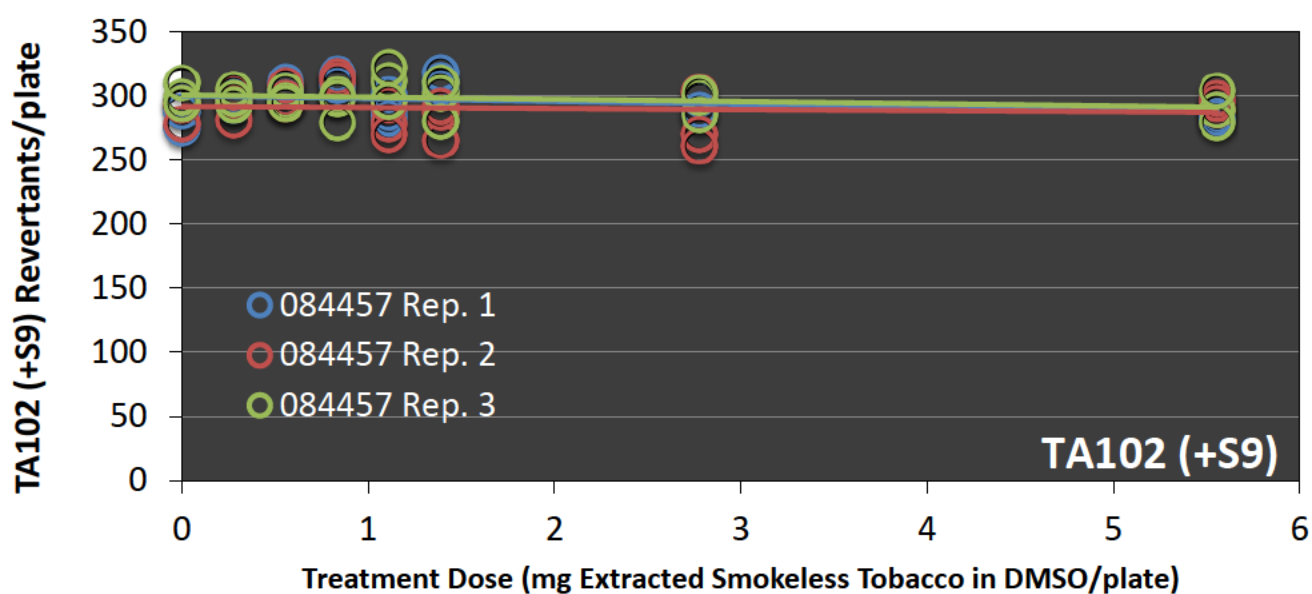
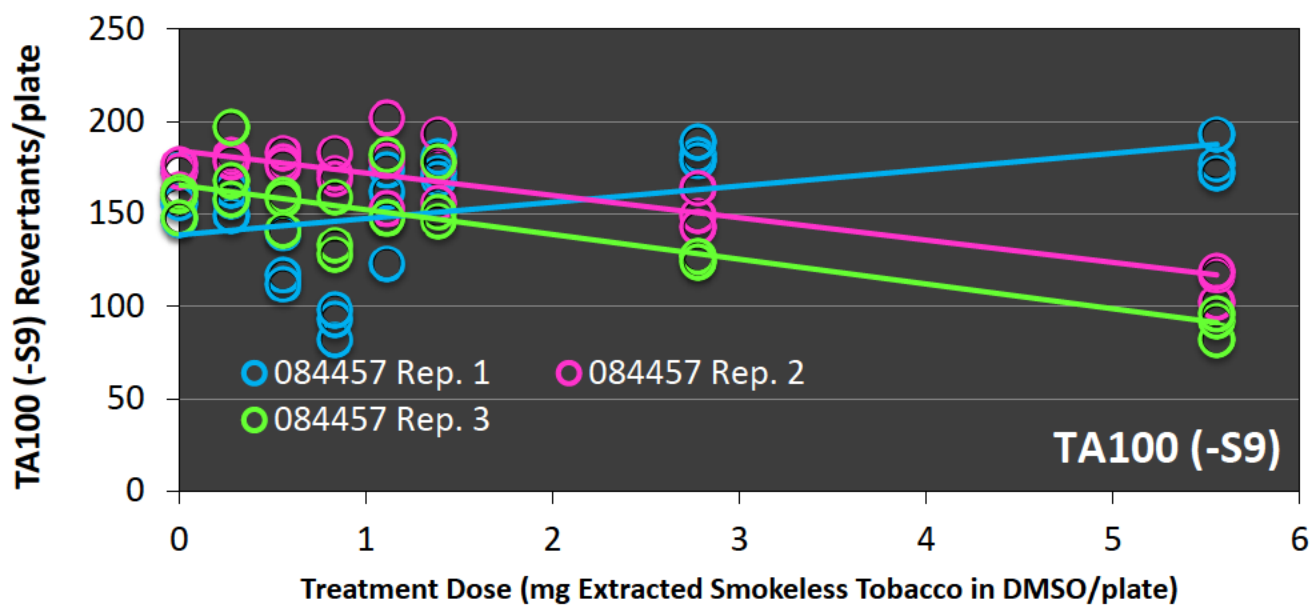


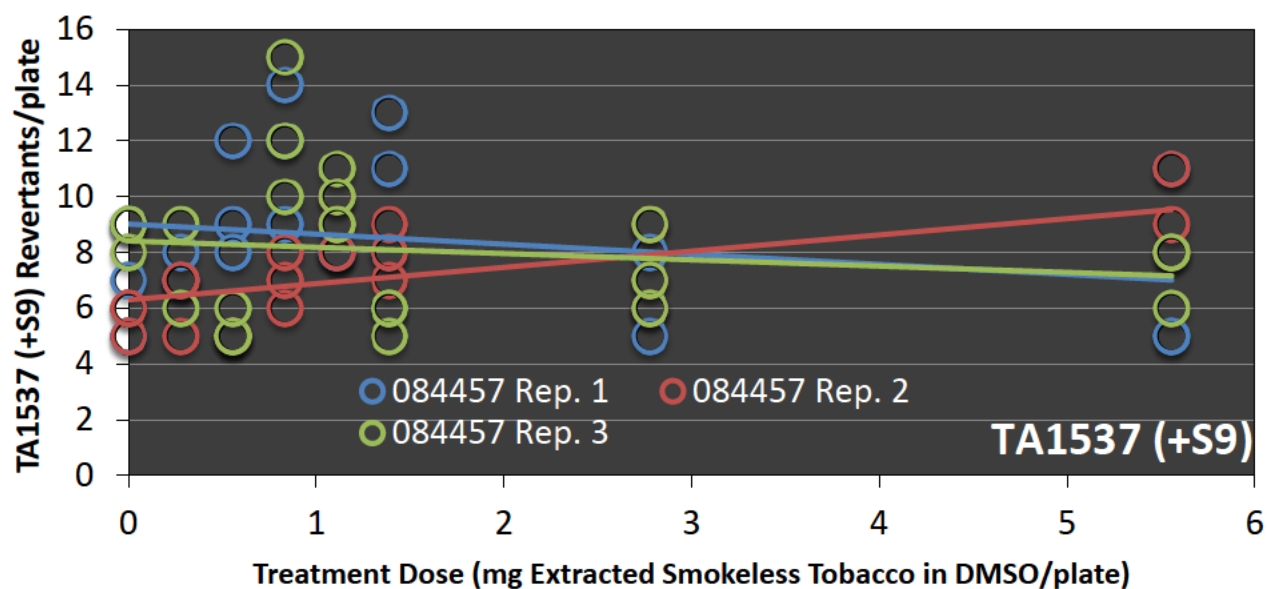
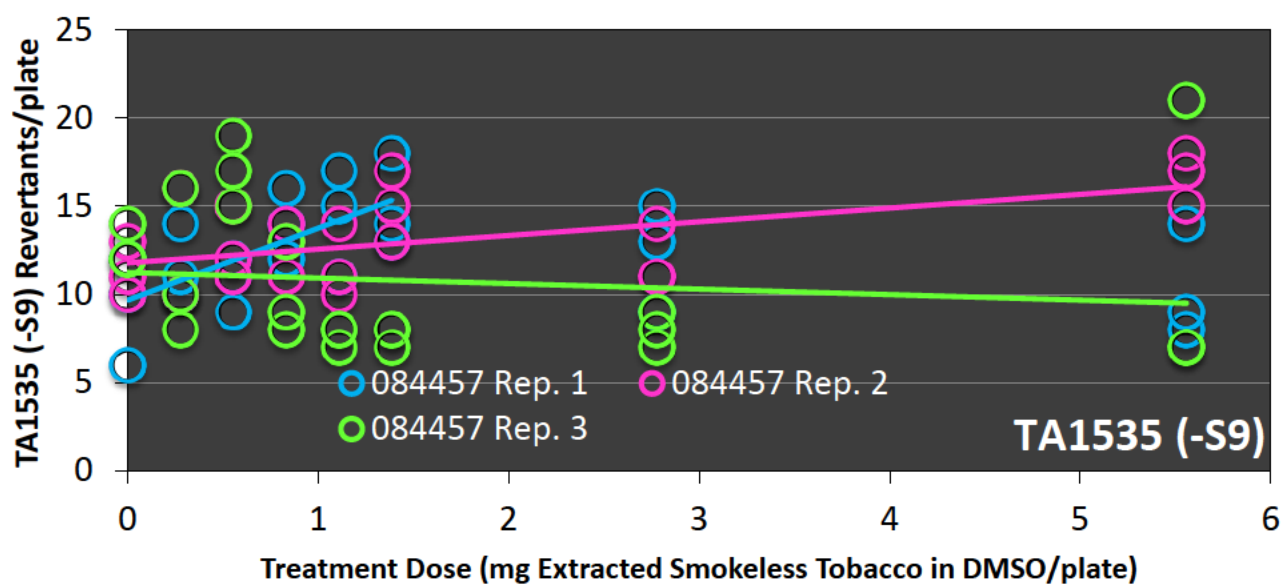
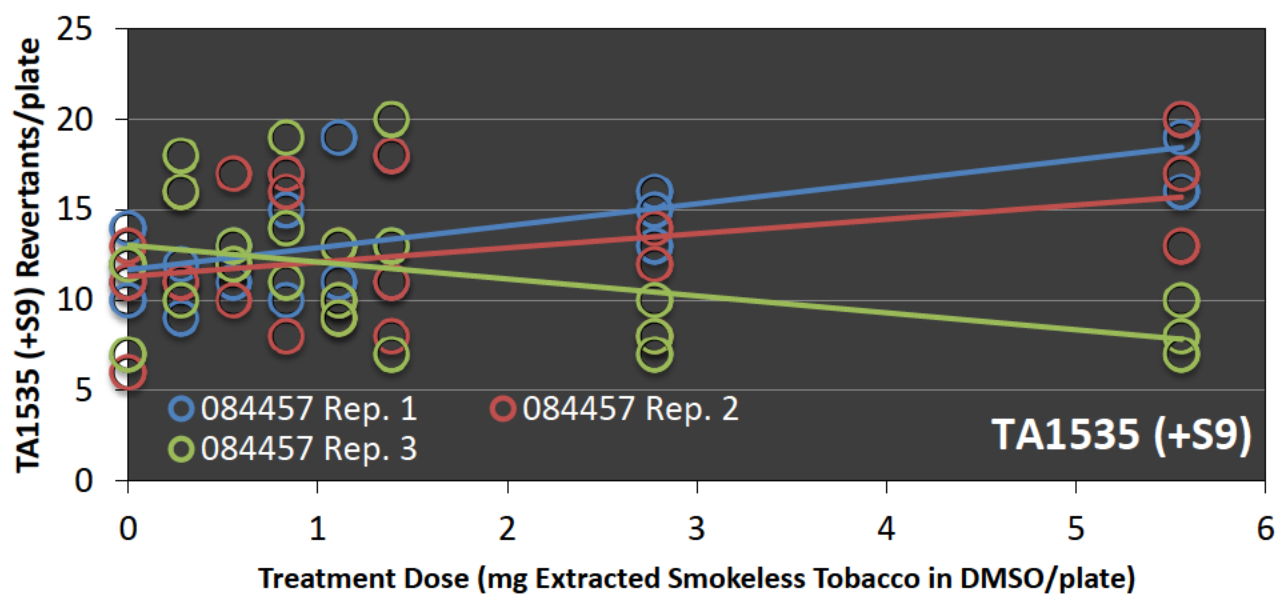


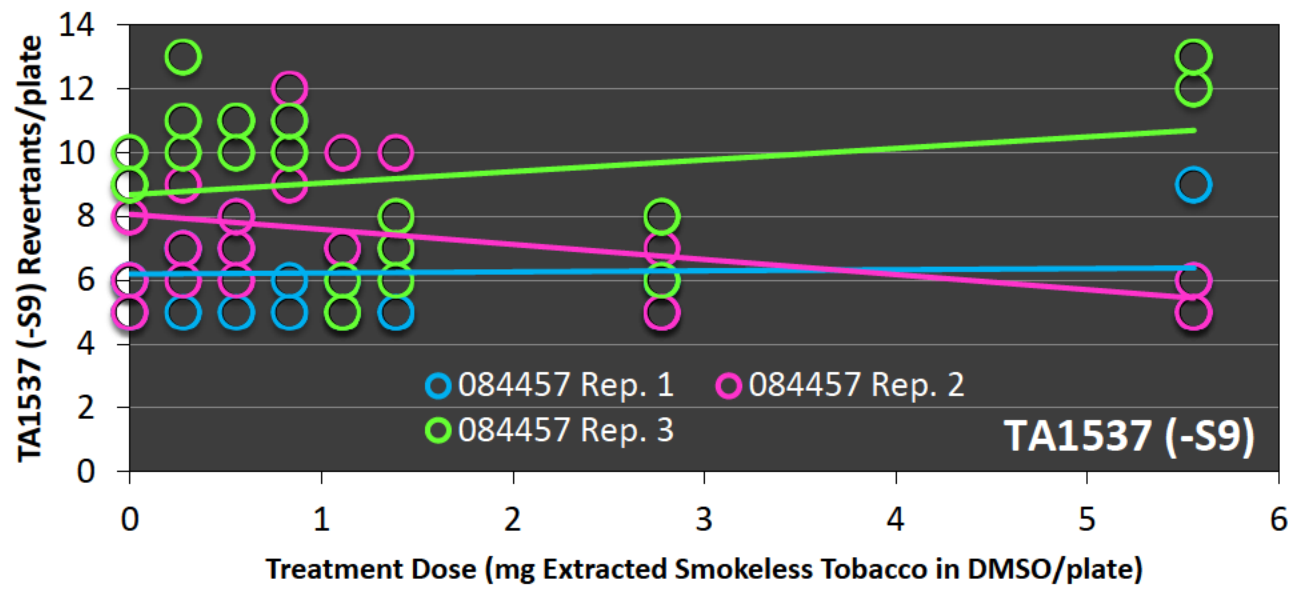


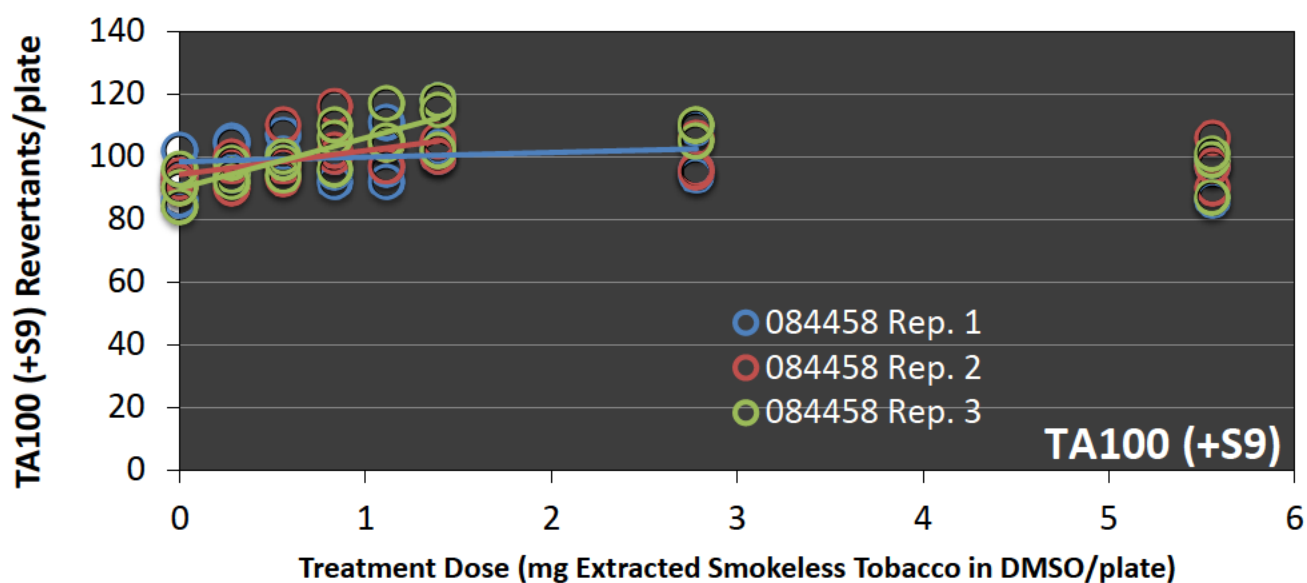
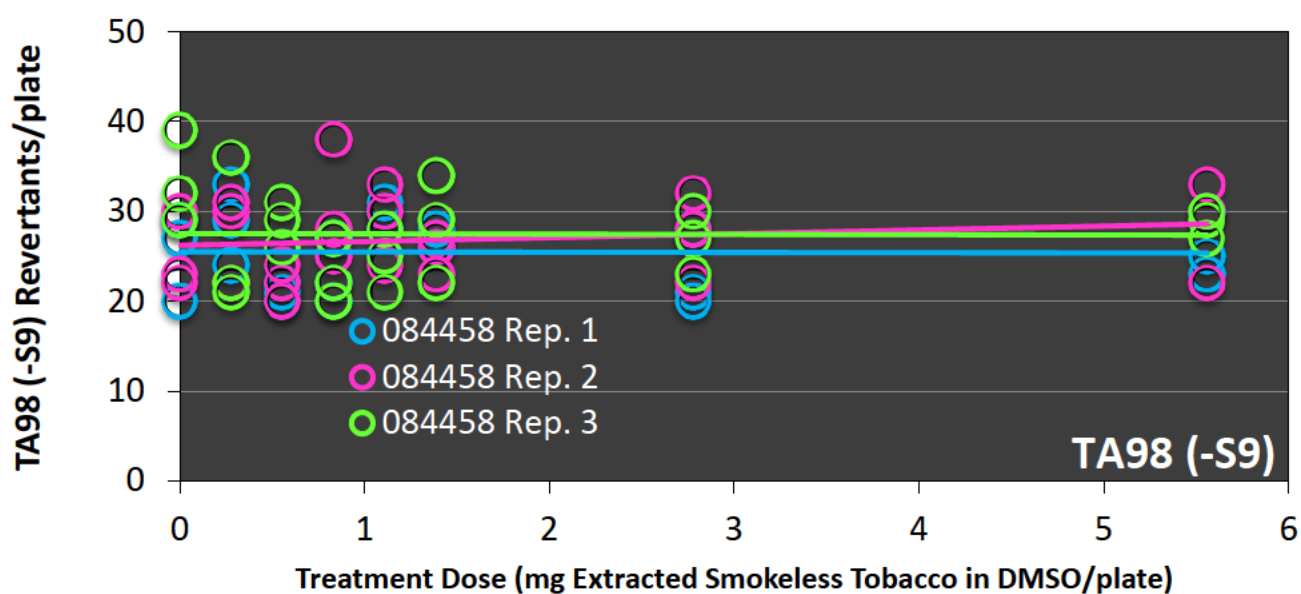
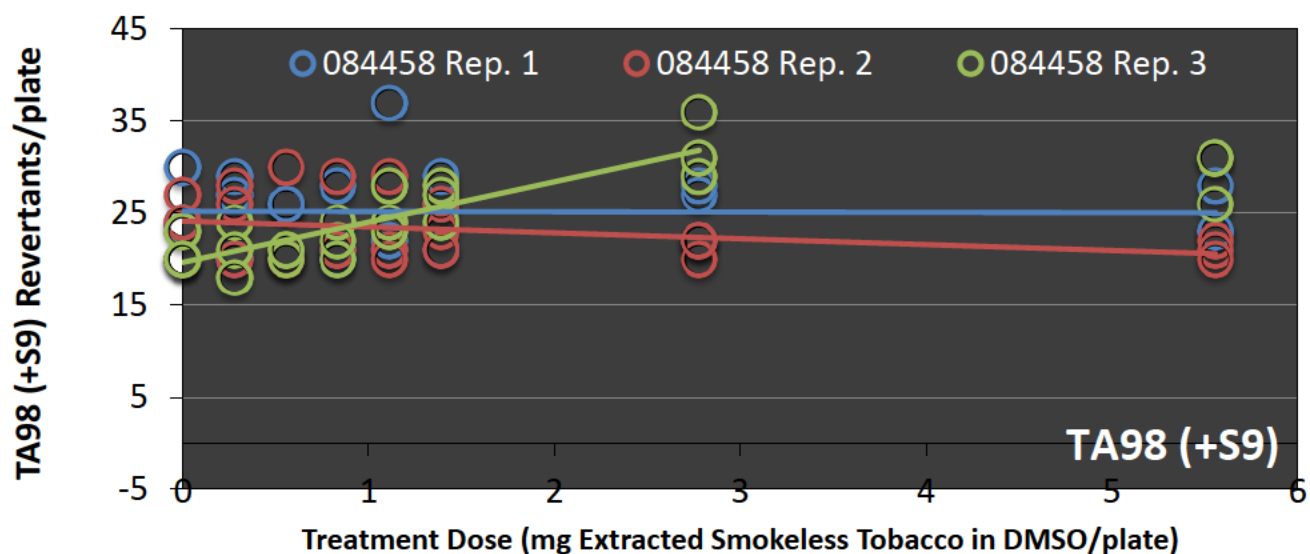


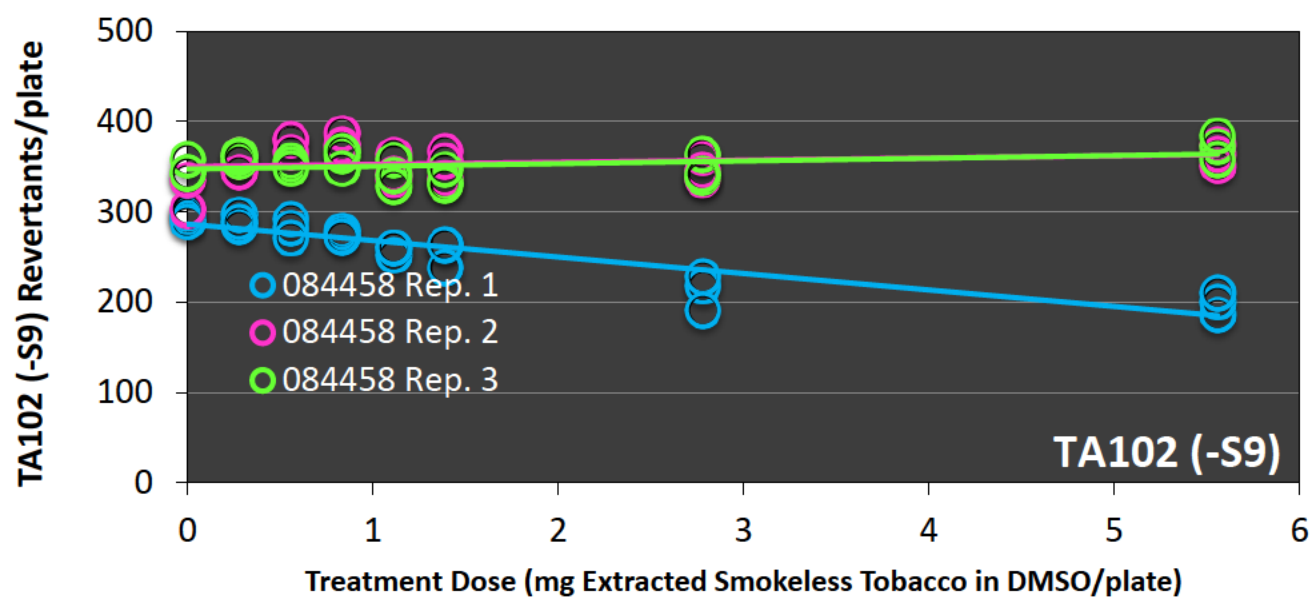
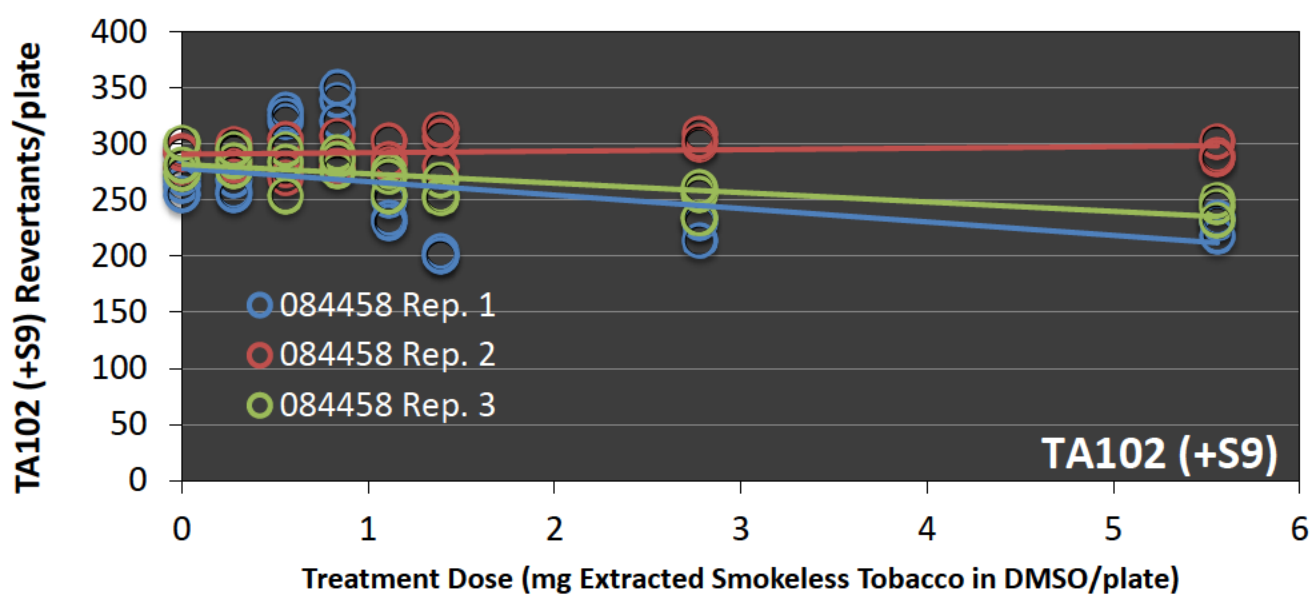
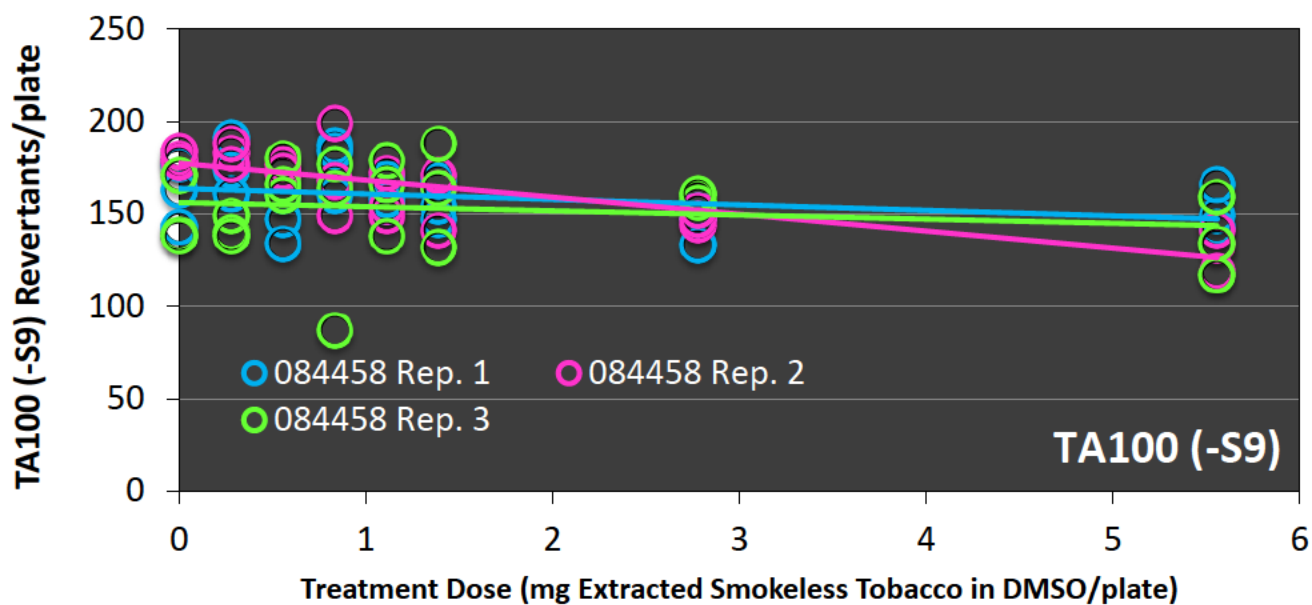


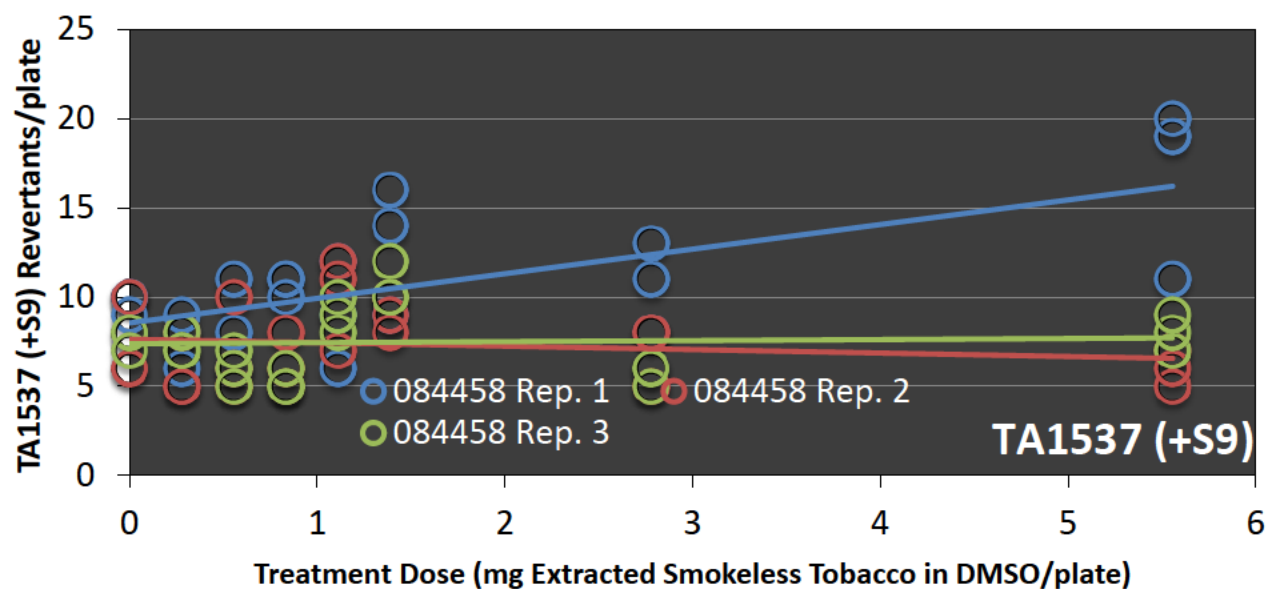
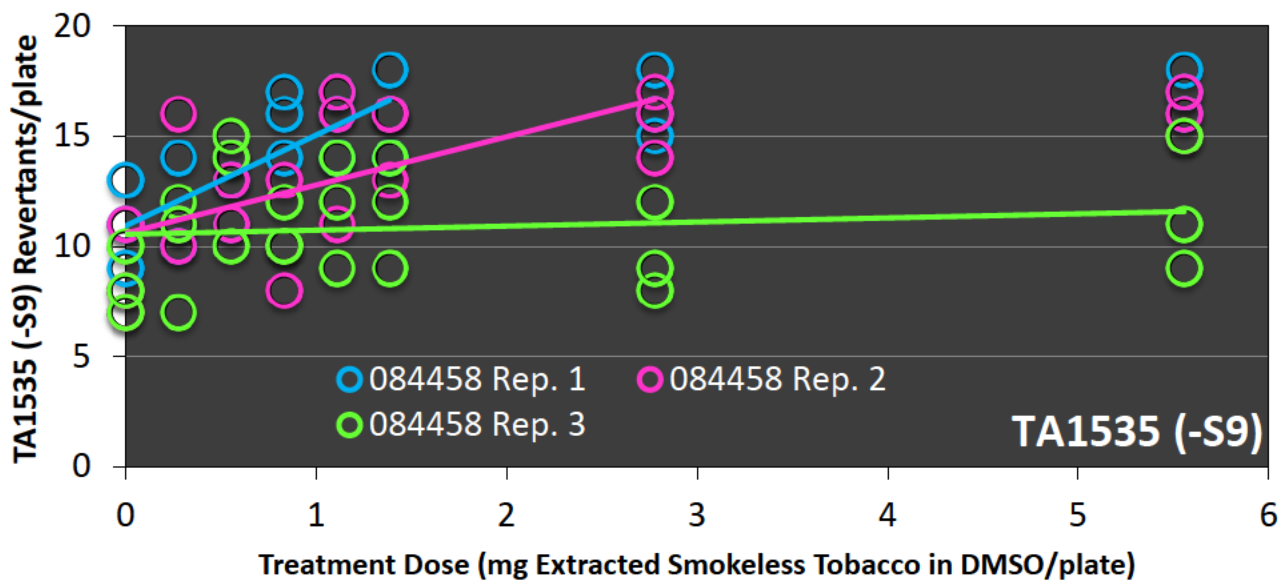
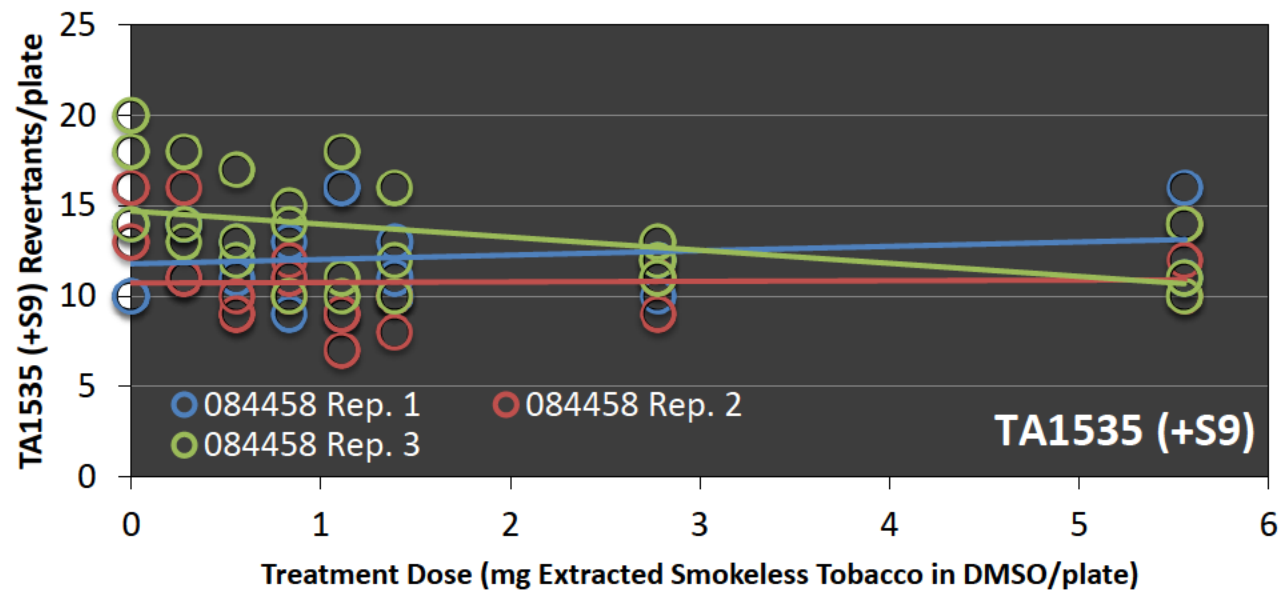


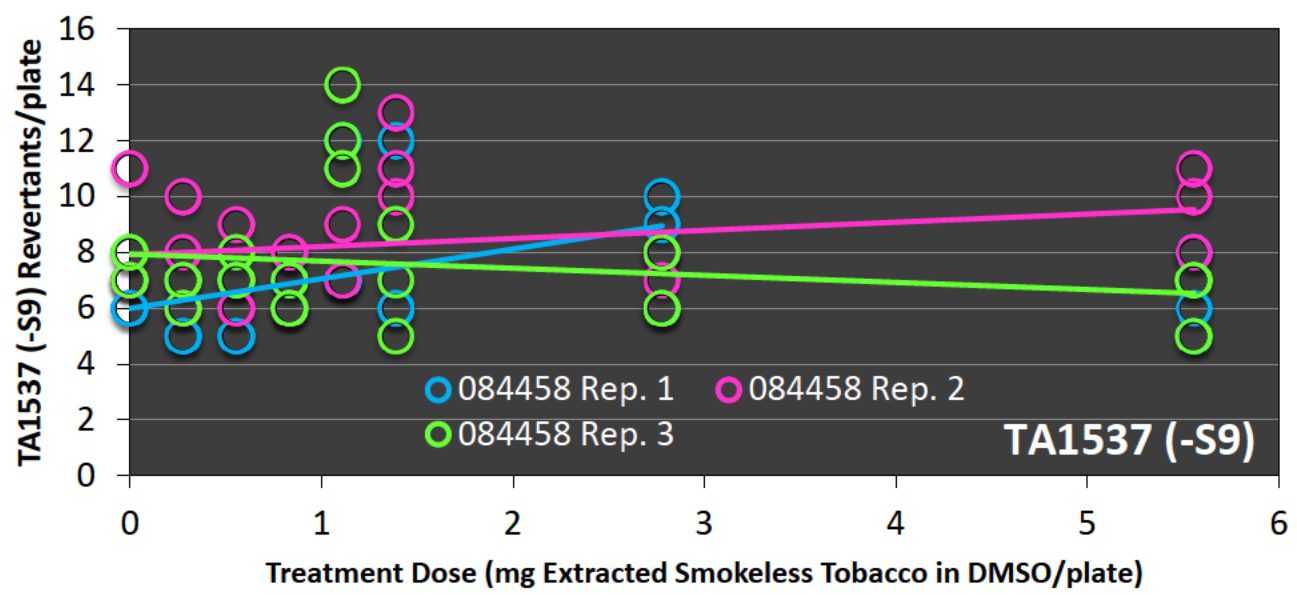












**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' (ST-H₂O))**

Strain and S9 Activation	Sample ID	Sample Description	Number of Revertant Colonies/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO'										
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'ST-H ₂ O' Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard			t-test p-value (H ₀ : mean = 0)	
			(mg ST-H ₂ O/plate)	slope	(mg ST-H ₂ O/plate)	slope	(mg ST-H ₂ O/plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA98 (+S9)	084394	Camel SNUS Frost	0 - 3.793	1.06	0 - 3.794	2.39	0 - 3.794	-2.12	0.444	1.340	0* - 6.21	0.772	not significant
TA98 (+S9)	084395	2S3	0 - 2.556	6.07	0 - 2.556	0.525	0 - 2.555	4.72	3.77	1.669	0* - 11	0.152	not significant
TA98 (+S9)	084454	Fresh Strips	0 - 4.941	-0.428	0 - 4.94	0.544	0 - 2.47	-2.78	0*	0.987	0* - 3.36	0.463	not significant
TA98 (+S9)	084455	Mellow Sticks	0 - 5.22	-1.11	0 - 5.222	0.011	0 - 5.218	1.14	0.014	0.651	0* - 2.82	0.984	not significant
TA98 (+S9)	084456	Copenhagen Long Cut	0 - 2.481	6.13	0 - 2.481	6.04	0 - 2.481	3.92	5.36	0.723	2.25 - 8.48	0.018	significant
TA98 (+S9)	084457	Ariva Wintergreen	0 - 5.352	0.338	0 - 5.351	-0.802	0 - 5.352	-1.05	0*	0.427	0* - 1.33	0.359	not significant
TA98 (+S9)	084458	Fresh Orbs	0 - 5.272	-0.036	0 - 5.271	-0.672	0 - 2.635	4.62	1.30	1.67	0* - 8.48	0.516	not significant
TA98 (-S9)	084394	Camel SNUS Frost	0 - 3.793	-0.402	0 - 3.794	1.60	0 - 1.897	0.000	0.398	0.611	0* - 3.03	0.581	not significant
TA98 (-S9)	084395	2S3	0 - 2.556	1.07	0 - 2.556	-1.25	0 - 1.278	-0.630	0*	0.692	0* - 2.71	0.733	not significant
TA98 (-S9)	084454	Fresh Strips	0 - 4.941	0.991	0 - 4.94	-0.091	0 - 4.941	1.03	0.643	0.367	0* - 2.22	0.222	not significant
TA98 (-S9)	084455	Mellow Sticks	0 - 5.22	1.59	0 - 5.222	1.18	0 - 5.218	1.16	1.31	0.140	0.707 - 1.91	0.011	significant
TA98 (-S9)	084456	Copenhagen Long Cut	0 - 2.481	0.359	0 - 2.481	0.443	0 - 2.481	1.20	0.666	0.266	0* - 1.81	0.129	not significant
TA98 (-S9)	084457	Ariva Wintergreen	0 - 5.352	-0.371	0 - 2.676	1.38	0 - 5.352	0.656	0.555	0.508	0* - 2.74	0.389	not significant
TA98 (-S9)	084458	Fresh Orbs	0 - 5.272	-0.029	0 - 5.271	0.452	0 - 5.27	-0.033	0.130	0.161	0* - 0.823	0.504	not significant
TA100 (+S9)	084394	Camel SNUS Frost	0 - 0.948	1.96	0 - 0.949	19.8	0 - 0.948	27.1	16.3	7.46	0* - 48.3	0.161	not significant
TA100 (+S9)	084395	2S3	0 - 0.511	26.9	0 - 0.511	61.8	0 - 0.511	24.8	37.8	12.01	0* - 89.5	0.088	not significant
TA100 (+S9)	084454	Fresh Strips	0 - 1.235	21.2	0 - 2.47	12.1	0 - 1.235	14.8	16.1	2.70	4.45 - 27.7	0.027	significant
TA100 (+S9)	084455	Mellow Sticks	0 - 2.61	13.4	0 - 1.305	19.8	0 - 2.609	8.83	14.0	3.18	0.317 - 27.7	0.048	significant
TA100 (+S9)	084456	Copenhagen Long Cut	0 - 1.241	30.5	0 - 0.62	57.3	0 - 0.62	42.8	43.5	7.74	10.2 - 76.8	0.030	significant
TA100 (+S9)	084457	Ariva Wintergreen	0 - 1.07	31.5	0 - 5.351	2.86	0 - 1.338	12.3	15.6	8.43	0* - 51.8	0.206	not significant
TA100 (+S9)	084458	Fresh Orbs	0 - 2.636	1.56	0 - 1.318	8.02	0 - 1.317	17.0	8.87	4.48	0* - 28.2	0.186	not significant
TA100 (-S9)	084394	Camel SNUS Frost	0 - 3.793	3.53	0 - 3.794	6.68	0 - 3.794	9.69	6.63	1.78	0* - 14.3	0.065	not significant
TA100 (-S9)	084395	2S3	0 - 1.278	8.85	0 - 2.556	9.34	0 - 2.555	12.0	10.1	0.985	5.83 - 14.3	0.009	significant
TA100 (-S9)	084454	Fresh Strips	0 - 4.941	-4.50	0 - 4.94	1.27	0 - 2.47	3.01	0*	2.27	0* - 9.68	0.977	not significant
TA100 (-S9)	084455	Mellow Sticks	0 - 2.61	11.3	0 - 5.222	-0.445	0 - 5.218	-7.43	1.13	5.45	0* - 24.6	0.855	not significant
TA100 (-S9)	084456	Copenhagen Long Cut	0 - 1.241	42.5	0 - 1.24	0.070	0 - 1.241	12.2	18.3	12.63	0* - 72.6	0.285	not significant
TA100 (-S9)	084457	Ariva Wintergreen	0 - 5.352	9.16	0 - 5.351	-12.6	0 - 5.352	-13.9	0*	7.47	0* - 26.4	0.521	not significant
TA100 (-S9)	084458	Fresh Orbs	0 - 5.272	-3.11	0 - 5.271	-9.69	0 - 5.27	-2.36	0*	2.33	0* - 4.95	0.162	not significant
TA102 (+S9)	084394	Camel SNUS Frost	0 - 0.759	61.2	0 - 0.949	83.6	0 - 0.948	61.0	68.6	7.52	36.3 - 101	0.012	significant
TA102 (+S9)	084395	2S3	0 - 0.511	102	0 - 2.556	9.52	0 - 0.639	35.8	49.2	27.6	0* - 168	0.217	not significant
TA102 (+S9)	084454	Fresh Strips	0 - 4.941	1.25	0 - 4.94	-3.79	0 - 4.941	0.753	0*	1.60	0* - 6.3	0.746	not significant
TA102 (+S9)	084455	Mellow Sticks	0 - 5.22	3.69	0 - 5.222	1.63	0 - 5.218	2.85	2.72	0.598	0.15 - 5.3	0.045	significant
TA102 (+S9)	084456	Copenhagen Long Cut	0 - 2.481	18.0	0 - 2.481	4.48	0 - 2.481	9.35	10.6	3.95	0* - 27.6	0.115	not significant
TA102 (+S9)	084457	Ariva Wintergreen	0 - 5.352	-2.33	0 - 5.351	-0.866	0 - 5.352	-1.76	0*	0.426	0* - 0.181	0.061	not significant
TA102 (+S9)	084458	Fresh Orbs	0 - 5.272	-12.6	0 - 5.271	1.42	0 - 5.27	-8.81	0*	4.18	0* - 11.3	0.252	not significant
TA102 (-S9)	084394	Camel SNUS Frost	0 - 3.793	-3.57	0 - 1.897	8.05	0 - 3.794	-2.08	0.799	3.65	0* - 16.5	0.847	not significant
TA102 (-S9)	084395	2S3	0 - 2.556	3.87	0 - 2.556	11.7	0 - 2.555	26.9	14.2	6.74	0* - 43.2	0.171	not significant

**Slope Analysis of the Linear Portion of the Dose-Response Curve
(Revertant Colonies/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO' (ST-H₂O))**

Strain and S9 Activation	Sample ID	Sample Description	Number of Revertant Colonies/mg 'Extracted Moisture-Corrected Smokeless Tobacco in DMSO'										
			Replicate 1		Replicate 2		Replicate 3		Statistics for Replicate 'ST-H ₂ O' Slope Estimates				
			Dose Range		Dose Range		Dose Range		Standard			t-test p-value (H ₀ : mean = 0)	
			(mg ST-H ₂ O/plate)	slope	(mg ST-H ₂ O/plate)	slope	(mg ST-H ₂ O/plate)	slope	Mean	Error	95% C.I.	p-value	significance
TA102 (-S9)	084454	Fresh Strips	0 - 4.941	-0.902	0 - 4.94	6.57	0 - 1.235	53.2	19.6	16.9	0* - 92.5	0.366	not significant
TA102 (-S9)	084455	Mellow Sticks	0 - 2.61	4.04	0 - 5.222	3.31	0 - 5.218	0.241	2.53	1.16	0* - 7.53	0.162	not significant
TA102 (-S9)	084456	Copenhagen Long Cut	0 - 2.481	-0.049	0 - 2.481	10.9	0 - 1.241	70.6	27.1	21.94	0* - 122	0.342	not significant
TA102 (-S9)	084457	Ariva Wintergreen	0 - 5.352	-4.80	0 - 5.351	-8.06	0 - 5.352	-0.906	0*	2.07	0* - 4.31	0.157	not significant
TA102 (-S9)	084458	Fresh Orbs	0 - 5.272	-19.2	0 - 5.271	2.55	0 - 5.27	3.19	0*	7.37	0* - 27.2	0.604	not significant
TA1535 (+S9)	084394	Camel SNUS Frost	0 - 3.793	0.124	0 - 3.794	0.763	0 - 3.794	-1.52	0*	0.681	0* - 2.72	0.785	not significant
TA1535 (+S9)	084395	2S3	0 - 2.556	0.804	0 - 2.556	0.327	0 - 2.555	-0.112	0.340	0.264	0* - 1.48	0.328	not significant
TA1535 (+S9)	084454	Fresh Strips	0 - 4.941	0.409	0 - 4.94	0.374	0 - 4.941	-0.407	0.126	0.266	0* - 1.27	0.684	not significant
TA1535 (+S9)	084455	Mellow Sticks	0 - 5.22	-0.070	0 - 5.222	-0.844	0 - 2.609	1.60	0.230	0.722	0* - 3.34	0.781	not significant
TA1535 (+S9)	084456	Copenhagen Long Cut	0 - 2.481	0.384	0 - 2.481	0.484	0 - 2.481	-0.522	0.115	0.320	0* - 1.49	0.753	not significant
TA1535 (+S9)	084457	Ariva Wintergreen	0 - 5.352	1.26	0 - 5.351	0.821	0 - 5.352	-0.973	0.371	0.684	0* - 3.31	0.642	not significant
TA1535 (+S9)	084458	Fresh Orbs	0 - 5.272	0.258	0 - 5.271	0.032	0 - 5.27	-0.762	0*	0.309	0* - 1.17	0.661	not significant
TA1535 (-S9)	084394	Camel SNUS Frost	0 - 3.793	0.100	0 - 3.794	1.40	0 - 3.794	-0.822	0.227	0.645	0* - 3	0.758	not significant
TA1535 (-S9)	084395	2S3	0 - 2.556	-0.586	0 - 2.556	0.639	0 - 2.555	2.03	0.694	0.755	0* - 3.94	0.455	not significant
TA1535 (-S9)	084454	Fresh Strips	0 - 2.47	0.754	0 - 2.47	1.85	0 - 2.47	1.23	1.28	0.317	0* - 2.64	0.056	not significant
TA1535 (-S9)	084455	Mellow Sticks	0 - 5.22	-0.845	0 - 5.222	0.070	0 - 5.218	-0.067	0*	0.285	0* - 0.946	0.429	not significant
TA1535 (-S9)	084456	Copenhagen Long Cut	0 - 2.481	0.879	0 - 2.481	2.05	0 - 1.241	3.98	2.31	0.905	0* - 6.2	0.126	not significant
TA1535 (-S9)	084457	Ariva Wintergreen	0 - 1.338	4.24	0 - 5.351	0.809	0 - 5.352	-0.323	1.57	1.37	0* - 7.47	0.370	not significant
TA1535 (-S9)	084458	Fresh Orbs	0 - 1.318	4.34	0 - 2.636	2.31	0 - 5.27	0.195	2.28	1.20	0* - 7.42	0.197	not significant
TA1537 (+S9)	084394	Camel SNUS Frost	0 - 1.897	4.28	0 - 3.794	1.85	0 - 3.794	1.93	2.68	0.796	0* - 6.11	0.078	not significant
TA1537 (+S9)	084395	2S3	0 - 0.639	17.0	0 - 2.556	2.32	0 - 2.555	2.12	7.14	4.92	0* - 28.3	0.284	not significant
TA1537 (+S9)	084454	Fresh Strips	0 - 4.941	0.210	0 - 4.94	-0.086	0 - 4.941	-0.346	0*	0.161	0* - 0.617	0.690	not significant
TA1537 (+S9)	084455	Mellow Sticks	0 - 5.22	-0.389	0 - 5.222	0.252	0 - 5.218	0.599	0.154	0.290	0* - 1.4	0.648	not significant
TA1537 (+S9)	084456	Copenhagen Long Cut	0 - 1.241	5.41	0 - 1.24	4.15	0 - 2.481	2.29	3.95	0.909	0.04 - 7.86	0.049	significant
TA1537 (+S9)	084457	Ariva Wintergreen	0 - 5.352	-0.375	0 - 5.351	0.606	0 - 5.352	-0.232	0*	0.306	0* - 1.32	0.999	not significant
TA1537 (+S9)	084458	Fresh Orbs	0 - 5.272	1.45	0 - 5.271	-0.201	0 - 5.27	0.064	0.438	0.512	0* - 2.64	0.483	not significant
TA1537 (-S9)	084394	Camel SNUS Frost	0 - 0.948	6.08	0 - 3.794	1.28	0 - 1.897	3.22	3.53	1.393	0* - 9.52	0.127	not significant
TA1537 (-S9)	084395	2S3	0 - 2.556	4.05	0 - 1.278	4.12	0 - 1.278	1.32	3.16	0.920	0* - 7.12	0.075	not significant
TA1537 (-S9)	084454	Fresh Strips	0 - 4.941	-0.096	0 - 4.94	0.302	0 - 4.941	0.125	0.110	0.115	0* - 0.606	0.438	not significant
TA1537 (-S9)	084455	Mellow Sticks	0 - 5.22	0.074	0 - 5.222	-0.293	0 - 5.218	-0.260	0*	0.117	0* - 0.344	0.305	not significant
TA1537 (-S9)	084456	Copenhagen Long Cut	0 - 2.481	0.285	0 - 2.481	-0.828	0 - 2.481	0.861	0.106	0.496	0* - 2.24	0.850	not significant
TA1537 (-S9)	084457	Ariva Wintergreen	0 - 5.352	0.034	0 - 5.351	-0.491	0 - 5.352	0.377	0*	0.252	0* - 1.06	0.925	not significant
TA1537 (-S9)	084458	Fresh Orbs	0 - 2.636	1.12	0 - 5.271	0.307	0 - 5.27	-0.269	0.388	0.404	0* - 2.13	0.439	not significant

0*: Mean or lower bound of the 95% confidence interval has been truncated at 0.

One-Way ANOVA of Mean 'Extracted Moisture-Corrected Smokeless Tobacco' Slope Estimates Among Test Samples

TA98 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	99.09717278	6	16.51619546	4.070	0.014
Within Samples	56.80848684	14	4.05774906		
Total (Corr.)	155.9056596	20			

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	3175.483288	6	529.2472146	3.352	0.029
Within Samples	2210.375596	14	157.8839712		
Total (Corr.)	5385.858884	20			

TA102 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	15475.1107	6	2579.185116	7.046	0.001
Within Samples	5124.873831	14	366.0624165		
Total (Corr.)	20599.98453	20			

TA1535 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	0.929754219	6	0.154959036	0.202	0.971
Within Samples	10.74664367	14	0.767617405		
Total (Corr.)	11.67639789	20			

TA1537 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	134.6347429	6	22.43912381	2.000	0.134
Within Samples	157.0346808	14	11.21676291		
Total (Corr.)	291.6694237	20			

One-Way ANOVA of Mean 'Extracted Moisture-Corrected Smokeless Tobacco' Slope Estimates Among Test Samples

TA98 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	4.336430708	6	0.722738451	1.240	0.344
Within Samples	8.159457846	14	0.582818418		
Total (Corr.)	12.49588855	20			

TA100 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	1346.050894	6	224.3418157	2.015	0.131
Within Samples	1558.496222	14	111.3211587		
Total (Corr.)	2904.547116	20			

TA102 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	2807.624332	6	467.9373887	1.231	0.348
Within Samples	5321.468772	14	380.1049123		
Total (Corr.)	8129.093104	20			

TA1535 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	17.73636021	6	2.956060035	1.303	0.318
Within Samples	31.76324971	14	2.268803551		
Total (Corr.)	49.49960993	20			

TA1537 (-S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	46.25592548	6	7.709320914	5.472	0.004
Within Samples	19.72316585	14	1.408797561		
Total (Corr.)	65.97909134	20			

One-way ANOVA analysis indicates significant differences (at $\alpha = 0.05$) among mean 'Extracted Moisture-Corrected Smokeless Tobacco' specific activity slope estimates for test samples with TA98 (+S9), TA100 (+S9), TA102 (+S9) and TA1537 (-S9).

**Evaluation of Ratio (Max ÷ Min) of Standard Deviations of
'Extracted Moisture-Corrected Smokeless Tobacco' Slope
Estimates and Corresponding Method of Comparison**

Strain and S9 Activation	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	3.9	ANOVA (equal variance)
TA98 (-S9)	5.0	ANOVA (equal variance)
TA100 (+S9)	4.4	ANOVA (equal variance)
TA100 (-S9)	12.8	ANOVA (equal variance)
TA102 (+S9)	64.8	Pairwise T-test (unequal variance)
TA102 (-S9)	18.9	Pairwise T-test (unequal variance)
TA1535 (+S9)	2.7	ANOVA (equal variance)
TA1535 (-S9)	4.8	ANOVA (equal variance)
TA1537 (+S9)	30.7	Pairwise T-test (unequal variance)
TA1537 (-S9)	12.1	ANOVA (equal variance)

**Evaluation of Ratio (Max ÷ Min) of Standard Deviations of
'Extracted Moisture-Corrected Smokeless Tobacco' Slope
Estimates and Corresponding Method of Comparison**

**ANOVA-Based Comparison Tests of Mean 'Extracted Moisture-Corrected Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

ANOVA-Based Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	4.093	0.0626	not significant	4.415	0.0542	not significant	1.545	0.2343	not significant	0.594	0.4537	not significant	2.661	0.1251	not significant
084394 vs. 084454	0.656	0.4317	not significant	0.000	0.9852	not significant	19.619	0.0006	significant	0.222	0.6445	not significant	1.017	0.3304	not significant
084394 vs. 084455	0.068	0.7980	not significant	0.048	0.8296	not significant	17.783	0.0009	significant	0.381	0.5471	not significant	0.856	0.3706	not significant
084394 vs. 084456	8.951	0.0097	not significant	7.054	0.0188	not significant	13.779	0.0023	significant	0.209	0.6545	not significant	0.215	0.6501	not significant
084394 vs. 084457	0.332	0.5734	not significant	0.005	0.9455	not significant	20.223	0.0005	significant	0.663	0.4293	not significant	0.963	0.3430	not significant
084394 vs. 084458	0.274	0.6090	not significant	0.520	0.4828	not significant	23.204	0.0003	significant	0.006	0.9404	not significant	0.674	0.4253	not significant
084395 vs. 084454	8.024	0.0133	not significant	4.495	0.0523	not significant	10.154	0.0066	not significant	0.089	0.7693	not significant	6.968	0.0194	not significant
084395 vs. 084455	5.216	0.0385	not significant	5.385	0.0359	not significant	8.845	0.0101	not significant	0.024	0.8802	not significant	6.535	0.0228	not significant
084395 vs. 084456	0.939	0.3490	not significant	0.308	0.5879	not significant	6.097	0.0270	not significant	0.098	0.7587	not significant	1.364	0.2624	not significant
084395 vs. 084457	6.757	0.0210	not significant	4.713	0.0476	not significant	10.589	0.0058	not significant	0.002	0.9660	not significant	6.827	0.0205	not significant
084395 vs. 084458	2.249	0.1559	not significant	7.965	0.0136	not significant	12.775	0.0031	not significant	0.482	0.4987	not significant	6.015	0.0279	not significant
084454 vs. 084455	0.301	0.5918	not significant	0.040	0.8441	not significant	0.045	0.8349	not significant	0.021	0.8863	not significant	0.007	0.9347	not significant
084454 vs. 084456	14.452	0.0019	significant	7.155	0.0181	not significant	0.514	0.4850	not significant	0.000	0.9889	not significant	2.167	0.1632	not significant
084454 vs. 084457	0.054	0.8190	not significant	0.003	0.9602	not significant	0.005	0.9470	not significant	0.117	0.7371	not significant	0.001	0.9789	not significant
084454 vs. 084458	1.777	0.2039	not significant	0.493	0.4941	not significant	0.150	0.7040	not significant	0.156	0.6985	not significant	0.035	0.8542	not significant
084455 vs. 084456	10.581	0.0058	not significant	8.267	0.0122	not significant	0.255	0.6215	not significant	0.026	0.8753	not significant	1.928	0.1867	not significant
084455 vs. 084457	0.100	0.7570	not significant	0.022	0.8832	not significant	0.078	0.7835	not significant	0.039	0.8467	not significant	0.003	0.9558	not significant
084455 vs. 084458	0.615	0.4461	not significant	0.252	0.6237	not significant	0.360	0.5580	not significant	0.293	0.5970	not significant	0.011	0.9188	not significant
084456 vs. 084457	12.733	0.0031	not significant	7.429	0.0164	not significant	0.616	0.4456	not significant	0.127	0.7266	not significant	2.088	0.1705	not significant
084456 vs. 084458	6.095	0.0271	not significant	11.403	0.0045	not significant	1.221	0.2878	not significant	0.145	0.7087	not significant	1.651	0.2197	not significant
084457 vs. 084458	1.209	0.2900	not significant	0.424	0.5254	not significant	0.102	0.7536	not significant	0.545	0.4727	not significant	0.026	0.8750	not significant

**ANOVA-Based Comparison Tests of Mean 'Extracted Moisture-Corrected Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

ANOVA-Based Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084395	1.151	0.3014	not significant	0.159	0.6964	not significant	0.704	0.4155	not significant	0.144	0.7100	not significant	0.142	0.7121	not significant
084394 vs. 084454	0.154	0.7003	not significant	0.606	0.4492	not significant	1.400	0.2564	not significant	0.730	0.4073	not significant	12.425	0.0034	not significant
084394 vs. 084455	2.134	0.1662	not significant	0.408	0.5333	not significant	0.012	0.9150	not significant	0.171	0.6859	not significant	14.469	0.0019	significant
084394 vs. 084456	0.185	0.6739	not significant	1.826	0.1980	not significant	2.737	0.1203	not significant	2.856	0.1132	not significant	12.457	0.0033	not significant
084394 vs. 084457	0.063	0.8055	not significant	2.074	0.1718	not significant	0.115	0.7401	not significant	1.199	0.2921	not significant	13.444	0.0025	not significant
084394 vs. 084458	0.185	0.6737	not significant	1.841	0.1964	not significant	0.111	0.7442	not significant	2.784	0.1174	not significant	10.490	0.0059	not significant
084395 vs. 084454	2.149	0.1648	not significant	1.385	0.2589	not significant	0.118	0.7359	not significant	0.226	0.6421	not significant	9.911	0.0071	not significant
084395 vs. 084455	6.420	0.0239	not significant	1.076	0.3173	not significant	0.534	0.4771	not significant	0.628	0.4414	not significant	11.746	0.0041	not significant
084395 vs. 084456	2.259	0.1551	not significant	0.908	0.3568	not significant	0.665	0.4285	not significant	1.717	0.2111	not significant	9.940	0.0071	not significant
084395 vs. 084457	1.753	0.2067	not significant	3.380	0.0873	not significant	1.387	0.2586	not significant	0.512	0.4862	not significant	10.823	0.0054	not significant
084395 vs. 084458	0.413	0.5307	not significant	3.080	0.1011	not significant	1.373	0.2608	not significant	1.661	0.2183	not significant	8.192	0.0125	not significant
084454 vs. 084455	1.140	0.3037	not significant	0.020	0.8908	not significant	1.155	0.3007	not significant	1.606	0.2257	not significant	0.078	0.7844	not significant
084454 vs. 084456	0.001	0.9711	not significant	4.536	0.0514	not significant	0.222	0.6447	not significant	0.698	0.4175	not significant	0.000	0.9964	not significant
084454 vs. 084457	0.020	0.8891	not significant	0.438	0.5189	not significant	2.315	0.1504	not significant	0.058	0.8135	not significant	0.020	0.8894	not significant
084454 vs. 084458	0.677	0.4243	not significant	0.334	0.5723	not significant	2.299	0.1517	not significant	0.663	0.4293	not significant	0.082	0.7790	not significant
084455 vs. 084456	1.063	0.3201	not significant	3.960	0.0665	not significant	2.390	0.1444	not significant	4.422	0.0541	not significant	0.075	0.7878	not significant
084455 vs. 084457	1.464	0.2464	not significant	0.642	0.4363	not significant	0.200	0.6617	not significant	2.273	0.1539	not significant	0.019	0.8928	not significant
084455 vs. 084458	3.575	0.0795	not significant	0.516	0.4846	not significant	0.195	0.6656	not significant	4.332	0.0562	not significant	0.319	0.5810	not significant
084456 vs. 084457	0.032	0.8606	not significant	7.792	0.0144	not significant	3.972	0.0661	not significant	0.354	0.5613	not significant	0.019	0.8929	not significant
084456 vs. 084458	0.739	0.4043	not significant	7.333	0.0170	not significant	3.950	0.0668	not significant	0.000	0.9832	not significant	0.084	0.7756	not significant
084457 vs. 084458	0.464	0.5069	not significant	0.007	0.9347	not significant	0.000	0.9956	not significant	0.329	0.5753	not significant	0.183	0.6753	not significant

Some ANOVA-based comparison p-values for tester strains TA98 (+S9), TA102 (+S9) and TA1537 (-S9) were significant at $\alpha = 0.05$.

Significant differences in mean 'Extracted Moisture-Corrected Smokeless Tobacco' specific activity slope were detected in TA102 (+S9) between Camel SNUS Frost (084394) and each of {Fresh Strips (084454), Mellow Sticks (084455), Copenhagen Long Cut (084456), Ariva Wintergreen (084457), Fresh Orbs (084458)}

Significant difference in mean 'Extracted Moisture-Corrected Smokeless Tobacco' specific activity slope were detected in TA98 (+S9) between Fresh Strips (084454) and Copenhagen Long Cut (084456).

Significant differences in mean 'Extracted Moisture-Corrected Smokeless Tobacco' specific activity slope were detected in TA1537 (-S9) between Camel SNUS Frost (084394) and Mellow Sticks (084455).

**Pairwise T-Test Comparisons of Mean 'Extracted Moisture-Corrected Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

Pairwise T-test Comparison	TA98 (+S9)			TA100 (+S9)			TA102 (+S9)			TA1535 (+S9)			TA1537 (+S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084395							0.679	0.5345	not significant				0.894	0.4217	not significant
084394 vs. 084454							9.003	0.0008	significant				3.395	0.0274	not significant
084394 vs. 084455							8.737	0.0009	significant				2.986	0.0405	not significant
084394 vs. 084456							6.828	0.0024	not significant				1.049	0.3534	not significant
084394 vs. 084457							9.331	0.0007	significant				3.146	0.0346	not significant
084394 vs. 084458							8.750	0.0009	significant				2.372	0.0767	not significant
084395 vs. 084454							1.801	0.1461	not significant				1.465	0.2167	not significant
084395 vs. 084455							1.683	0.1676	not significant				1.417	0.2294	not significant
084395 vs. 084456							1.384	0.2386	not significant				0.638	0.5583	not significant
084395 vs. 084457							1.842	0.1393	not significant				1.448	0.2211	not significant
084395 vs. 084458							2.001	0.1160	not significant				1.355	0.2470	not significant
084454 vs. 084455							1.940	0.1244	not significant				0.689	0.5288	not significant
084454 vs. 084456							2.627	0.0584	not significant				4.360	0.0121	not significant
084454 vs. 084457							0.637	0.5586	not significant				0.213	0.8416	not significant
084454 vs. 084458							1.353	0.2474	not significant				0.954	0.3943	not significant
084455 vs. 084456							1.973	0.1198	not significant				3.980	0.0164	not significant
084455 vs. 084457							5.959	0.0040	not significant				0.366	0.7326	not significant
084455 vs. 084458							2.221	0.0906	not significant				0.482	0.6547	not significant
084456 vs. 084457							3.084	0.0368	not significant				4.119	0.0146	not significant
084456 vs. 084458							3.001	0.0399	not significant				3.367	0.0281	not significant
084457 vs. 084458							1.190	0.2998	not significant				0.734	0.5034	not significant

**Pairwise T-Test Comparisons of Mean 'Extracted Moisture-Corrected Smokeless Tobacco' Slope
for Contrasts of Interest using Bonferroni-adjusted p-values**

Pairwise T-test Comparison	TA98 (-S9)			TA100 (-S9)			TA102 (-S9)			TA1535 (-S9)			TA1537 (-S9)		
	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$	t-statistic	p-value	significance at $\alpha = 0.05$
084394 vs. 084395							1.742	0.1564	not significant						
084394 vs. 084454							1.087	0.3382	not significant						
084394 vs. 084455							0.451	0.6750	not significant						
084394 vs. 084456							1.184	0.3018	not significant						
084394 vs. 084457							1.284	0.2685	not significant						
084394 vs. 084458							0.644	0.5545	not significant						
084395 vs. 084454							0.300	0.7788	not significant						
084395 vs. 084455							1.699	0.1645	not significant						
084395 vs. 084456							0.566	0.6019	not significant						
084395 vs. 084457							2.658	0.0565	not significant						
084395 vs. 084458							1.868	0.1352	not significant						
084454 vs. 084455							1.007	0.3707	not significant						
084454 vs. 084456							0.271	0.8000	not significant						
084454 vs. 084457							1.419	0.2288	not significant						
084454 vs. 084458							1.306	0.2615	not significant						
084455 vs. 084456							1.120	0.3253	not significant						
084455 vs. 084457							2.999	0.0400	not significant						
084455 vs. 084458							0.942	0.3996	not significant						
084456 vs. 084457							1.440	0.2233	not significant						
084456 vs. 084458							1.367	0.2434	not significant						
084457 vs. 084458							0.012	0.9913	not significant						

Pairwise t-test comparison p-values less than the Bonferroni-adjusted $\alpha = 0.05$ indicate that significant differences in mean 'Extracted Moisture-Corrected Smokeless Tobacco' specific activity slope were as follows for strain TA102 (+S9):

TA102 (+S9): Camel SNUS Frost (084394) was significantly different from each of {Fresh Strips (084454), Mellow Sticks (084455), Ariva Wintergreen (084457), Fresh Orbs (084458)}

Number of Mean 'Extracted Moisture-Corrected Smokeless Tobacco' Slope Estimates Significantly Greater than Zero (0), the Corresponding Number of Paired Comparisons and Comparison Method

Strain and S9 Activation	# of Significant Mean Slopes	Number of Comparisons	Std. Dev. Ratio (Max ÷ Min)	Method of Comparison
TA98 (+S9)	1	0		
TA98 (-S9)	1	0		
TA100 (+S9)	3	3	2.9	ANOVA (equal variance)
TA100 (-S9)	1	0		
TA102 (+S9)	2	1	12.6	ANOVA (equal variance)
TA102 (-S9)	0	0		
TA1535 (+S9)	0	0		
TA1535 (-S9)	0	0		
TA1537 (+S9)	1	0		
TA1537 (-S9)	0	0		

One-Way ANOVA and ANOVA-Based Comparisons Among Test Samples of Mean 'Extracted Smokeless Tobacco' Slope Estimates that are Significantly Greater than Zero (0)

TA100 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	1627.401	2	813.701	10.528	0.011
Within Samples	463.743	6	77.290		
Total (Corr.)	2091.144	8			

TA100 (+S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084454 vs. 084455	0.08	0.7842	not significant
084454 vs. 084456	14.61	0.0087	significant
084455 vs. 084456	16.89	0.0063	significant

TA102 (+S9)

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Among Samples	6509.537	1	6509.54	76.33	0.001
Within Samples	341.117	4	85.279		
Total (Corr.)	6850.654	5			

TA102 (+S9)			
ANOVA-Based Comparison	f-ratio	p-value	significance at $\alpha = 0.05$
084394 vs. 084455	76.33	0.0009	significant

Both TA100 (+S9) and TA102 (+S9) strains have more than one test sample for which the mean 'extracted moisture-corrected smokeless tobacco' specific activity slope estimate is greater than zero (0) .

TA100 (+S9):

Significant differences among mean 'Extracted Moisture-Corrected Smokeless Tobacco' specific activity slope estimates were detected in TA100 (+S9) between test sample 084456 (Copenhagen Long Cut) and each of {084454 (Fresh Strips), 084455 (Mellow Sticks)}.

TA102 (+S9):

Significant differences among mean 'Extracted Smokeless Tobacco' specific activity slope estimates were detected in TA102 (+S9) between test samples 084394 (Camel SNUS Frost) and 084455 (Mellow Sticks) .

**Number of Mean 'Extracted Moisture-Corrected Smokeless Tobacco'
Slope Estimates Significantly Greater than Zero (0), the Corresponding
Number of Paired Comparisons and Comparison Method**

**One-Way ANOVA and ANOVA-Based Comparisons Among
Test Samples of Mean 'Extracted Smokeless Tobacco'
Slope Estimates that are Significantly Greater than Zero (0)**

