REFERENCES

[1] Refetoff, S.; Weiss R.E.; and Usala S.J. The syndromes of resistance to thyroid hormone. Endocr. Rev. 14(1993): 348-99.

[2] Brucker-Davis, F., et al. Genetic and clinical features of 42 kindreds with resistance to thyroid hormone. The National Institutes of Health Prospective Study. Ann. Intern. Med. 123(1995): 572-83.

[3] Olateju, T.O. and Vanderpump M.P.Thyroid hormone resistance. Ann.Clin. Biochem. 43(200 6): 431-40.

[4] Usala, S.J., et al. Tight linkage between the syndrome of generalized thyroid hormone resistance and the human c-erbA beta gene. Mol. Endocrinol. 2(1988): 1217-20.

[5] Takeda, K., et al. Recessive inheritance of thyroid hormone resistance caused by complete deletion of the protein-coding region of the thyroid hormone receptor-beta gene. J. Clin. Endocrinol. Metab. 74(1992): 49-55.

[6] Yen, P.M. Molecular basis of resistance to thyroid hormone. Trends Endocrinol Metab. 14(2003): 327-33.

[7] Lafranchi, S.H., et al.Follow-up of newborns with elevated screening T4 concentrations. J Pediatr. 143(2003): 296-301.

[8] Weiss, R.E. and Refetoff S. Resistance to thyroid hormone. Rev. Endocr. Metab. Disord. 1(2000): 97-108.

[9] Kvistad, P.H., et al. Retarded bone growth in thyroid hormone resistance. A clinical study of a large family with a novel thyroid hormone receptor mutation. Eur. J. Endocrinol. 150(2004): 425-430.

[10] Beck-Peccoz, P. and Chatterjee V.K. The variable clinical phenotype in thyroid hormone resistance syndrome. Thyroid. 4(1994): 225-232.

[11] Frankton, S., et al. Multiple messenger ribonucleic acid variants regulate cell-specific expression of human thyroid hormone receptor beta1. Mol. Endocrinol. 18(2004): 1631-1642.

[12] Safer, J.D., et al. Isoform variable action among thyroid hormone receptor mutants provides insight into pituitary resistance to thyroid hormone. Mol. Endocrinol. 11(1997): 16-26.

[13] Cheng, S.Y. Thyroid hormone receptor mutations and disease: beyond thyroid hormone resistance. Trends Endocrinol Metab. 16(2005): 176-182.

[14] Wondisford, F.E. Thyroid hormone action: insight from transgenic mouse models. J. Investig. Med. 51(2003): 215-220.

[15] Cheng, S.Y. Multiple mechanisms for regulation of the transcriptional activity of thyroid hormone receptors. Rev. Endocr. Metab. Disord. 1(2000): 9-18.

[16] Yen, P.M. Physiological and molecular basis of thyroid hormone action. Physiol Rev. 81(2001): 1097-1142.

[17] O'Shea, P.J., et al. A thyrotoxic skeletal phenotype of advanced bone formation in mice with resistance to thyroid hormone. Mol.Endocrinol. 17(2003): 1410-1424.

[18] Zhang, X.Y., et al. Differential expression of thyroid hormone receptor isoforms dictates the dominant negative activity of mutant Beta receptor. Mol Endocrinol. 16(2002): 2077-2092.

[19] Zhang, J. and Lazar M.A. The mechanism of action of thyroid hormones. Annu Rev. Physiol. 62(2000): 439-466.

[20] Umesono, K. and Evans R.M. Determinants of target gene specificity for steroid/thyroid hormone receptors. Cell. 57(1989): 1139-1146.

[21] Burnside, J.; Darling, DS.; and Chin W.W. A nuclear factor that enhances binding of thyroid hormone receptors to thyroid hormone response elements. J. Biol. Chem. 265 (1990): 2500–2504.

[22] Murray, M. and Towle H. Identification of nuclear factors that enhance binding of the thyroid hormone receptor to a thyroid hormone response element. Mol. Endocrinol. 3(1989): 1434–1442.

[23] Feng, X., et al. TH regulation of hepatic genes in vivo detected by cDNA microarray. Mol. Endocrinol. 14(2000): 947-955.

[24] Flores-Morales A., et al. Patterns of liver gene expression governed by TRbeta. Mol. Endocrinol. 16(2002): 1257-1268.

[25] Leedman P.J., et al. Regulated specific protein binding to a conserved region of the 3'-untranslated region of thyrotropin beta-subunit mRNA. Mol. Endocrinol. 9(1995): 375-387.

[26] Williams G.R. and Brent G.A. TH response elements. In B. D. Weintraub: Molecular Endocrinology: Basic Concepts and Clinical Correlations. New York: Raven Press, 1994.

[27] Horlein, A.J., et al. Ligand-independent repression by the thyroid hormone receptor mediated by a nuclear co-repressor. Nature. 377(1995): 397–404.

[28] Chen, J.D. and Evans R.M. A transcriptional co-repressor that interacts with nuclear hormone receptors. Nature. 377(1995): 454–457.

[29] McKenna, N.J. et al. Nuclear receptor coregulators: cellular and molecular biology. Endocr. Rev. 120(1999): 321–344.

[30] Onate, S.A. et al. Sequence and characterization of a coactivator for the steroid hormone receptor superfamily. Science. 270(1995): 1354–1357.

[31] Torchia, J. et al. Co-activators and co-repressors in the integration of transcriptional responses. Curr. Opin. Cell Biol. 10(1998): 373–383.

[32] Ito, M. and Roeder R.G. The TRAP/SMCC/mediator complex and thyroid hormone receptor function. Trends Endocrinol.Metab. 12(2001): 127–134.

[33] Rachez, C. and Freedman L.P., Mediator complexes and transcription. Curr. Opin. Cell Biol. 13 (2001): 274–280.

[34] Sharma, D. and Fondell J.D. Ordered recruitment of histone acetyltransferases and the TRAP/Mediator complex to thyroid hormone-responsive promoters in vivo. Proc. Natl. Acad. Sci. U. S. A. 99(2002): 7934–7939.

[35] Shang, Y. et al. Cofactor dynamics and sufficiency in estrogen receptor-regulated transcription. Cell. 103(2000): 843–852.

[36] Phillips, S.A., et al. Extreme thyroid hormone resistance in a patient with a novel truncated TR mutant. J. Clin. Endocrinol. Metab. 86(2001): 5142-5147.

[37] Takeda, K. et al. Recessive inheritance of thyroid hormone resistance caused by complete deletion of the protein-coding region of the thyroid hormone receptor-b gene. J. Clin. Endocrinol. Metab. 74(1992): 49–55.

[38] Yen, P.M. and Chin W.W. Molecular mechanisms of dominant negative activity by nuclear hormone receptors. Mol. Endocrinol. 8(1994): 1450-1454.

[39] Safer, J.D., et al. Defective release of corepressor by hinge mutants of the thyroid hormone receptor found in patients with resistance to thyroid hormone. J Biol. Chem. 273(1998): 30175-30182.

[40] Pohlenz, J., et al. Five new families with resistance to thyroid hormone not caused by mutations in the thyroid hormone receptor beta gene. J.Clin. Endocrinol. Metab. 84(1999): 3919-3928.

[41] Reutrakul, S., et al. Search for abnormalities of nuclear corepressors, coactivators, and a coregulator in families with resistance to thyroid hormone without mutations in thyroid hormone receptor beta or alpha genes. J. Clin. Endocrinol. Metab. 85(2000): 3609-3617.

[42] Hayashi, Y.; Sunthornthepvarakul T.; and Refetoff S. Mutations of CpG dinucleotides located in the triiodothyronine (T3)-binding domain of the thyroid hormone receptor (TR) beta gene that appears to be devoid of natural mutations may not be detected because they are unlikely to produce the clinical phenotype of resistance to thyroid hormone. J. Clin. Invest. 94(1994): 607-615.

[43] Frank-Raue, K., et al. Severe form of thyroid hormone resistance in a patient with homozygous/hemizygous mutation of T3 receptor gene. Eur. J. Endocrinol. 150(2004): 819-823.

[44] Ditudompo, S., et al. A de novo L330S point mutation in thyroid hormone receptor beta gene in a Thai female with resistance to thyroid hormone. Endocr. J. 46(1999): 825-829.

[45] Lam, C.W., et al. DNA-based diagnosis of thyroid hormone resistance syndrome: a novel THRB mutation associated with mild resistance to thyroid hormone. Clin. Chim. Acta. 358(2005): 55-59.

[46] Kvistad, P.H., et al., Retarded bone growth in thyroid hormone resistance. A clinical study of a large family with a novel thyroid hormone receptor mutation. Eur. J. Endocrinol.150(2004): 425-430.

[47] Bayer, Y., M. Fasshauer, and Paschke R. The novel missense mutation methionine 442 threonine in the thyroid hormone receptor beta causes thyroid hormone resistance: a case report. Exp. Clin. Endocrinol. Diabetes. 112(2004): 95-97.

[48] Kijima, H., et al. A novel missense mutation in the thyroid hormone receptor beta gene in a kindred with resistance to thyroid hormone. Hum. Genet. 97(1996): 407-408.

[49] Geffner, M.E., et al. An arginine to histidine mutation in codon 311 of the C-erbA beta gene results in a mutant thyroid hormone receptor that does not mediate a dominant negative phenotype. J. Clin. Invest. 91(1993): 538-46.

[50] Phillips, S.A., et al. Extreme thyroid hormone resistance in a patient with a novel truncated TR mutant. J. Clin. Endocrinol. Metab. 86(2001): 5142-5147.

[51] Dumitrescu *et al.* Multiple etiologies for reduced sensitivity to thyroid hormone. Journal of hotthyroidology[Online]. 2006. Available from: http://www.hotthyroidology.com/_css/thyruidology.css" type=text/css rel=stylesheet [2006, January].

[52] Dumitrescu A.M. et al. A novel syndromecombining thyroid and neurological abnormalities is associated with mutations in a monocarboxylate transporter gene. Am. J. Hum. Genet. 74(2004): 168-175.

[53] Friesema E.C.et al. Association between mutations in a thyroid hormone transporter and severe X-linked psychomotor retardation. Lancet. 364(2004): 1435-1437.

[54] Schwartz C.E. et al. Allan-Herndon-Dudley syndrome and the monocarboxylate transporter 8 (MCT8) gene. Am. J. Hum. Genet. 77(2005): 41-53.

[55] Maranduba C.M. et al. Decreased cellular T_3 uptake and metabolism in Allan-Herndon-Dudley syndrome(AHDS) due to a novel mutation in the MCT8 thyroid hormone transporter. J. Med. Genet . (2005).

[56] Hayashi, Y., et al. Do clinical manifestations of resistance to thyroid hormone correlate with the functional alteration of the corresponding mutant thyroid hormone-beta receptors?. J. Clin. Endocrinol. Metab. 80(1995): 3246-3256.

[57] Reutrakul, S. et al.Search for abnormalities of nuclear corepressors, coactivators, and a coregulator in families with resistance to thyroid hormone without mutations in thyroid hormone receptor b or a genes. J. Clin. Endocrinol. Metab. 8(2000) : 3609–3617.

APPENDICES

APPENDIX A

BUFFERS AND REAGENT

1. Lysis Buffer I

Sucrose	109.54	g
1.0 M Tris – HCl (pH 7.5)	10	ml
1.0 M MgCl$_2$	5	ml
Triton X – 100 (pure)	10	ml
Distilled water to	1,000	ml

   Sterilize the solution by autoclaving and store in a refrigerator (at 4^{0}C).

2. Lysis Buffer II

5.0 M NaCl	15	ml
0.5 M EDTA (pH 8.0)	48	ml
Distilled water to	1,000	ml

   Sterilize the solution by autoclaving and store at room temperature.

3. 10% SDS solution

Sodium dodecyl sulfate	10	g
Distilled water to	100	ml

   Mix the solution and store at room temperature.

4. 20 mg/ml Proteinase K

Proteinase K	2	mg
Distilled water to	1	ml

   Mix the solution and store in a refrigerator (at -20^{0}C).

5. 1.0 M Tris – HCl

Tris base	12.11	g

   Dissolve in distilled water and adjusted pH to 7.5 with HCl

Distilled water to	100	ml

   Sterilize the solution by autoclaving and store at room temperature.

6. 0.5 M EDTA (pH 8.0)

Disodium ethylenediamine tetraacetate.$2H_2O$ 186.6   g

Dissolve in distilled water and adjusted pH to 8.0 with NaOH

Distilled water to   1,000   ml

Sterilize the solution by autoclaving and store at room temperature.

7. 1.0 M $MgCl_2$ solution

Magnesium chloride.$6H_2O$ 20.33   g

Distilled water to   100   ml

Dispense the solution into aliquots and sterilize by autoclaving.

8. 5 M NaCl solution

Sodium chloride   29.25   g

Distilled water to   100   ml

Dispense the solution into aliquot and sterilize by autoclaving.

9. 10X Tris borate buffer (10X TBE buffer)

Tris – base   100   g

Boric acid   55   g

0.5 M EDTA (pH 8.0)   40   ml

Adjust volume to 1,000 ml with distilled water. The solution was mixed and store at room temperature.

10. 6X loading dye

Bromphenol blue   0.25   g

Xylene cyanol   0.25   g

Glycerol   50   ml

1M Tris (pH 8.0)   1   ml

Distilled water until   100   ml

Mixed and stored at 4^0C

11. 7.5 M Ammonium acetate (CH₃COONH₄)

Ammonium acetate	57.81	g
Distilled water	80	ml

Adjust volume to 100 ml with distilled water and sterilize by autoclaving.

12. 25:24:1 (v/v) Phenol-chloroform-isoamyl alcohol

Phenol	25	volume
Chloroform	24	volume
Isoamyl alcohol	1	volume

Mix the reagent and store in a sterile bottle kept in a refrigerator.

13. 2% Agarose gel (w/v)

Agarose	1.6	g
1X TBE	80	ml

Dissolve by heating in microwave oven and occasional mix until no granules of agarose are visible.

14. Ethidium bromide

Ethidium bromide	10	mg
Distilled water	1	ml

Mix the solution and store at 4°C

15. LB agar

Agar	1.5	g
Peptone	1.0	g
Yeast extract	0.5	g
NaCl	0.5	g
Distilled water	100	ml

16. LB broth

Peptone	1.0	g
Yeast extract	0.5	g
NaCl	0.5	g
Distilled water	100	ml

17. SOC medium (100 ml)

Peptone		2.0	g
Yeast extract		0.5	g
1M NaCl	(1 ml)	0.06	g
1M KCl	(0.25 ml)	0.02	g
2M Mg^{2+}		1.0	ml
2M Glucose		1.0	ml
Distilled water		97.0	ml

18. Cell culture medium:

DMEM+10%(v/v) FCS+1%PenStrep

DMEM	45	ml
10% (v/v) FCS	5	ml
1%PenStrep	0.5	ml
Total Volume	50	ml

19. Cell culture medium:

DMEM+10%(v/v) charcoal-stripped FBS +1%PenStrep

DMEM	45	ml
10%(v/v)charcoal-stripped FBS	5	ml
1%PenStrep	0.5	ml
Total Volume	50	ml

20. 10^{-7}M T_3 for cell culture

T_3	1	mg
1.0 NaOH	1	ml
10% FBS	5	ml
DMEM	44	ml
1%PenStrep	0.5	ml
Total Volume	50	ml

APPENDIX B

Raw data of luiferase reporter assays

1. **Table results of T_3-dependent transactivation assays**

Samples	Condition	No.	Luciferase Activity(RLU)					
			Firefly(F)	Renilla(R)	Ratio(F:R)	F-NTC	R-NTC	(F-NTC):(R-NTC)
Negative control	No T₃	1	19068	84100	0.2267	18979	83711.5	0.226719149
		2	16305	41520	0.3927	16216	41131.5	0.394247718
		3	23364	86839	0.269	23275	86450.5	0.269229212
		4	29285	119909	0.2442	29196	119520.5	0.244276087
		5	11784	77522	0.152	11695	77133.5	0.151620243
		6	24544	397080	0.0618	24455	396691.5	0.061647401
	Average		20725	134495	0.2244	20636	134106.5	0.224623301
	10⁹ MIU	1	38022	119660	0.3178	37933	119271.5	0.318039096
		2	14656	61508	0.2383	14567	61119.5	0.238336374
		3	22419	67077	0.3342	22330	66688.5	0.33484034
		4	23149	230799	0.1003	23060	230410.5	0.100082245
		5	28558	182557	0.1564	28469	182168.5	0.156278391
		6	26202	142601	0.1837	26113	142212.5	0.183619583
	Average		25501	134033.6667	0.221783333	25412	133645.1667	0.221866005
wild-type	No T₃	1	11500	52685	0.2183	11411	52296.5	0.218198159
		2	3241	15353	0.2111	3152	14964.5	0.210631829
		3	16482	47383	0.3478	16393	46994.5	0.348828054
		4	20626	157370	0.1311	20537	156981.5	0.130824333
		5	12811	142182	0.0901	12722	141793.5	0.089722025
		6	29439	128842	0.2285	29350	128453.5	0.228487351
	Average		15683.16667	90635.83333	0.204483333	15594.16667	90247.33333	0.204448625

	1	242111	33611	7.2033	242022	33222.5	7.284882233
	2	148784	16900	8.8035	148695	16511.5	9.005541592
	3	169433	26629	6.3625	169344	26240.5	6.453535565
(O₇MT)	4	342979	57003	6.0168	342890	56614.5	6.056575612
	5	325934	76143	4.2805	325845	75754.5	4.301328634
	6	427517	83520	5.1187	427428	83131.5	5.141588928
Average		276126.3333	48967.66667	6.29755	276037.3333	48579.16667	6.373908761
	1	4955	34655	0.143	4866	34266.5	0.142004582
	2	6778	35829	0.1892	6689	35440.5	0.188738872
	3	6969	44424	0.1569	6880	44035.5	0.156237581
N T	4	5917	78367	0.0755	5828	77978.5	0.07473855
	5	16001	92433	0.1731	15912	92044.5	0.172872904
	6	3599	41644	0.0864	3510	41255.5	0.085079565
Average		7369.833333	54558.66667	0.13735	7280.833333	54170.16667	0.136612009
	1	8615	1997	4.3136	8526	1608.5	5.300590612
	2	93422	27112	3.4457	93333	26723.5	3.492544016
	3	143082	20485	6.9845	142993	20096.5	7.115318588
II MT	4	315675	73934	4.2697	315586	73545.5	4.291030722
	5	204893	62903	3.2572	204804	62514.5	3.276103944
	6	304103	68993	4.4077	304014	68604.5	4.431400273
Average		178298.3333	42570.66667	4.4464	178209.3333	42182.16667	4.651164692
	1	9279	24148	0.3843	9190	23759.5	0.386792651
	2	9504	40473	0.2348	9415	40084.5	0.234878818
	3	8150	24365	0.3345	8061	23976.5	0.3362042
N T	4	94185	98931	0.952	94096	98542.5	0.954877337
	5	26884	105308	0.2553	26795	104919.5	0.255386272
	6	20018	180668	0.1108	19929	180279.5	0.110545015
Average		28003.33333	78982.16667	0.378616667	27914.33333	78593.66667	0.379780716
	1	35866	64275	0.558	35777	63886.5	0.560008766
	2	20927	22877	0.9148	20838	22488.5	0.926606932
	3	11419	17307	0.6598	11330	16918.5	0.669681118

HT MT)	4	53180	115983	0.4585	53091	115594.5	0.459286558
	5	34608	192310	0.18	34519	191921.5	0.179859995
	6	56851	190467	0.2985	56762	190078.5	0.29862399
Average		35475.16667	100536.5	0.5116	35386.16667	100148	0.515677893
	1	6333	41727	0.1518	6244	41338.5	0.151045635
	2	13159	56952	0.2311	13070	56563.5	0.231067738
	3	5203	29040	0.1792	5114	28651.5	0.178489782
	4	32890	57498	0.572	32801	57109.5	0.574352778
	5	17221	24143	0.7133	17132	23754.5	0.721210718
M313T	6	8060	24275	0.3321	7971	23886.5	0.333703138
Average		13811	38939.16667	0.36325	13722	38550.66667	0.364978298
	1	8866	24761	0.3581	8777	24372.5	0.360118987
	2	5720	16992	0.3366	5631	16603.5	0.339145361
	3	9141	27264	0.3353	9052	26875.5	0.336812338
MT	4	31422	67163	0.4679	31333	66774.5	0.469236011
	5	14241	35457	0.4016	14152	35068.5	0.403553046
	6	28724	53927	0.5326	28635	53538.5	0.534848754
Average		16352.33333	37594	0.40535	16263.33333	37205.5	0.407285749
	1	6387	34310	0.1862	6298	33921.5	0.185663959
	2	5225	32619	0.1602	5136	32230.5	0.159352166
	3	4919	41974	0.1172	4830	41585.5	0.116146253
	4	60362	251435	0.2401	60273	251046.5	0.240086996
	5	29051	197636	0.147	28962	197247.5	0.146830758
R3 GT	6	30368	112580	0.2697	30279	112191.5	0.269886756
Average		22718.66667	111759	0.186733333	22629.66667	111370.5	0.186327815
	1	22001	12704	1.7319	21912	12315.5	1.779221306
	2	24583	12384	1.9851	24494	11995.5	2.041932391
	3	27506	35488	0.7751	27417	35099.5	0.781122238
	4	140793	156341	0.9006	140704	155952.5	0.902223433
	5	139068	111719	1.2448	138979	111330.5	1.248346141
	6	94324	67922	1.3887	94235	67533.5	1.395381551

	Average		74712.5	66093	1.3377	74623.5	65704.5	1.358037844
		1	4582	26551	0.1726	4493	26162.5	0.171734353
		2	7070	29843	0.2369	6981	29454.5	0.237009625
		3	5822	37025	0.1572	5733	36636.5	0.156483289
	no.1	4	24571	63130	0.3892	24482	62741.5	0.390204251
		5	15285	31850	0.4799	15196	31461.5	0.483003035
L33P8		6	39940	121832	0.3278	39851	121443.5	0.328144363
	Average		16211.66667	51705.16667	0.293933333	16122.66667	51316.66667	0.294429819
		1	3582	14162	0.2529	3493	13773.5	0.253602933
		2	5379	27104	0.1985	5290	26715.5	0.19801239
		3	11369	58242	0.1952	11280	57853.5	0.194975239
	10² MT	4	54469	93430	0.583	54380	93041.5	0.584470371
		5	40737	56998	0.7147	40648	56609.5	0.718042025
		6	33024	64060	0.5155	32935	63671.5	0.517264396
	Average		24760	52332.66667	0.409966667	24671	51944.16667	0.411061226
		1	8461	48705	0.1737	8372	48316.5	0.17327414
		2	4633	25939	0.1786	4544	25550.5	0.177843878
		3	7964	21211	0.3755	7875	20822.5	0.378196662
	No.13	4	38910	78010	0.4988	38821	77621.5	0.500132051
		5	30483	98775	0.3086	30394	98386.5	0.308924497
G34IA		6	37377	324031	0.1154	37288	323642.5	0.115213546
	Average		21304.66667	99445.16667	0.2751	21215.66667	99056.66667	0.275597462
		1	99637	22686	4.392	99548	22297.5	4.464536383
		2	95945	14172	6.77	95856	13783.5	6.954402002
		3	101255	16587	6.1045	101166	16198.5	6.245393092
	10² MT₂	4	677642	122766	5.5198	677553	122377.5	5.536581479
		5	612107	74909	8.1713	612018	74520.5	8.212746828
		6	544495	44031	12.366	544406	43642.5	12.47421665
	Average		317317.2	50224	6.19152	355091.1667	48803.33333	7.314646072
		1	2681	25801	0.1039	2592	25412.5	0.101997049
		2	6355	50603	0.1256	6266	50214.5	0.124784674

		3	4021	32766	0.1227	3932	32377.5	0.12144236
	No T₃	4	38329	118020	0.3248	38240	117631.5	0.325082992
		5	16302	63799	0.2555	16213	63410.5	0.255683207
		6	32051	108939	0.2942	31962	108550.5	0.2944436
	Average		16623.16667	66654.66667	0.20445	16534.16667	66266.16667	0.203905647
		1	3442	22175	0.1552	3353	21786.5	0.153902646
		2	4418	31126	0.142	4329	30737.5	0.140837739
		3	3692	41202	0.0896	3603	40813.5	0.088279613
	MT	4	35235	74369	0.4738	35146	73980.5	0.475071134
		5	39168	92083	0.4254	39079	91694.5	0.426186958
		6	29037	80356	0.3614	28948	79967.5	0.361997061
	Average		19165.33333	56885.16667	0.274566667	19076.33333	56496.66667	0.274379192
		1	6046	46809	0.1292	5957	46420.5	0.128326925
		2	3304	35406	0.0933	3215	35017.5	0.091811237
		3	3495	40008	0.0874	3406	39619.5	0.085967768
	No T₃	4	31477	96977	0.3246	31388	96588.5	0.324966223
		5	30573	126968	0.2408	30484	126579.5	0.240828886
M442T		6	24590	89309	0.2753	24501	88920.5	0.275538262
	Average		16580.83333	72579.5	0.191766667	16491.83333	72191	0.191239883
		1	25908	44637	0.5804	25819	44248.5	0.583500006
		2	28825	26928	1.0704	28736	26539.5	1.082763428
		3	44580	45369	0.9826	44491	44980.5	0.989117506
	MT	4	108041	90783	1.1901	107952	90394.5	1.19423195
		5	239210	151014	1.584	239121	150625.5	1.587520041
		6	135953	260533	0.5218	135864	260144.5	0.522263588
	Average		97086.16667	103210.6667	0.988216667	96997.16667	102822.1667	0.993232753
		1	96	411	0.2354			
		2	82	366	0.2252			
			89	388.5	0.2303			

2. Table results of dominant negative effect (DNE)

Sample	No.	Ratio WT:MT (1:1) Firefly(F)	Renilla(R)	Ratio(F:R)	Ratio WT:MT (1:4) Firefly(F)	Renilla(R)	Ratio(F:R)	RatioWT:MT (1:1) F-NTC	R-NTC	(F-NTC):(R-NTC)	Ratio WT:MT (1:4) F-NTC	R-NTC	(F-NTC)-(R-NTC)
Negative control	1	6995	7862	0.8897				6914.5	7549	0.91594913			
	2	10089	14250	0.708				10008.5	13937	0.71812442			
	3	11068	16753	0.6607				10987.5	16440	0.66833942			
	4	23242	52106	0.4461				23161.5	51793	0.44719364			
	5	17916	48848	0.3668				17835.5	48535	0.36747708			
	6	14587	28138	0.5184				14506.5	27825	0.52134771			
Average		13982.83	27992.83	0.598283				13902.33	27679.83	0.60640523			
Wild-type	1	121483	10746	11.305				121402.5	10433	11.6363941			
	2	420738	47271	8.9004				420657.5	46958	8.95816474			
	3	435032	43611	9.9751				434951.5	43298	10.0455333			
	4	400884	45826	8.7479				400803.5	45513	8.80635203			
	5	430467	75454	5.705				430386.5	75141	5.72771856			
	6	428041	38990	10.978				427960.5	38677	11.0649869			
Average		372774.2	43649.67	9.268567				372693.7	43336.67	9.37319161			
WT:1276	1	20813	13826	1.5053	36432	18403	1.9797	20732.5	13513	1.5342633	36351.5	18090	2.009480376
	2	90356	43978	2.0545	52970	31205	1.6975	90275.5	43665	2.06745677	52889.5	30892	1.712077561
	3	77887	35949	2.1666	47115	28992	1.6251	77806.5	35636	2.18336794	47034.5	28679	1.640032777
	4	765875	175395	4.3666	384922	392265	0.981281	765794.5	175082	4.37391908	384841.5	391952	0.981858748
	5	435570	379274	1.148431	298101	167562	1.779	435489.5	378961	1.14916706	298020.5	167249	1.781897052
	6	668974	486438	1.3753	358390	412382	0.869073	668893.5	486125	1.37597017	358309.5	412069	0.869537626
Average		343245.8	189143.3	2.102788	196321.7	175134.8	1.488609	343165.3	188830.3	2.11402406	196241.2	174821.8	1.499147356
WT:2805	1	16376	14730	1.1117	28987	36303	0.7985	16295.5	14417	1.13029757	28906.5	35990	0.803181439
	2	13231	12174	1.0868	25955	38507	0.6741	13150.5	11861	1.10871765	25874.5	38194	0.677449338
	3	25082	23436	1.0702	30192	39121	0.7717	25001.5	23123	1.08123946	30111.5	38808	0.775909606

	4	142474	31758	4.4862	232686	168396	1.3818	142393.5	31445	4.52833519	232605.5	168083	1.383872849
	5	283889	57228	4.9606	154348	33318	4.6325	283808.5	56915	4.98653255	154267.5	33005	4.674064536
	6	88609	16959	5.2248	105863	38402	2.7567	88528.5	16646	5.3183047	105782.5	38089	2.777245399
Average		94943.5	26047.5	2.99005	96338.5	59007.83	1.835883	94863	25734.5	3.02557118	96258	58694.83	1.848620528
	1	13342	19197	0.695	13010	18218	0.7141	13261.5	18884	0.70226117	12929.5	17905	0.722116727
	2	12748	32619	0.3908	46612	105203	0.4431	12667.5	32306	0.39210982	46531.5	104890	0.44362189
	3	25171	12047	2.0894	46136	55411	0.8326	25090.5	11734	2.13827339	46055.5	55098	0.835883335
	4	65391	55388	1.1806	33436	84396	0.3962	65310.5	55075	1.18584657	33355.5	84083	0.396697311
	5	50746	33254	1.526	36479	100206	0.364	50665.5	32941	1.53806806	36398.5	99893	0.364374881
	6	30190	30627	0.9857	38718	68793	0.5628	30109.5	30314	0.99325394	38637.5	68480	0.564215829
Average		32931.33	30522	1.144583	35731.83	72037.83	0.552133	32850.83	30209	1.15830216	35651.33	71724.83	0.554484996
	1	33088	22411	1.4764	24749	111729	0.2215	33007.5	22098	1.49368721	24668.5	111416	0.221408954
	2	25923	24561	1.0554	29459	49229	0.5984	25842.5	24248	1.065758	29378.5	48916	0.600590809
	3	24256	30160	0.8043	22762	22828	0.9971	24175.5	29847	0.8099809	22681.5	22515	1.00739507
	4	170722	118963	1.4351	127481	67261	1.8953	170641.5	118650	1.43819216	127400.5	66948	1.902976937
	5	218728	73676	2.9688	121498	119148	1.0197	218647.5	73363	2.98035113	121417.5	118835	1.021731813
	6	142388	40685	3.4998	105899	43168	2.4531	142307.5	40372	3.52490588	105818.5	42855	2.469221794
Average		102517.5	51742.67	1.8733	71974.67	68893.83	1.197517	102437	51429.67	1.88547921	71894.17	68580.83	1.203887563
	1	11571	10671	1.0844	19755	38851	0.5085	11490.5	10358	1.10933578	19674.5	38538	0.510522082
	2	31812	27570	1.1539	27292	178099	0.1532	31731.5	27257	1.16415967	27211.5	177786	0.153057609
	3	31055	33140	0.937	23418	43495	0.5384	30974.5	32827	0.94356779	23337.5	43182	0.540445093
	4	118210	73058	1.618	82957	45492	1.8235	118129.5	72745	1.6238848	82876.5	45179	1.834403152
	5	126941	136931	0.927	84071	72416	1.1609	126860.5	136618	0.92857823	83990.5	72103	1.164868313
	6	98626	120263	0.8201	43791	44370	0.987	98545.5	119950	0.82155481	43710.5	44057	0.992135189
Average		69702.5	66938.83	1.090067	46880.67	70453.83	0.861917	69622	66625.83	1.09851351	46800.17	70140.83	0.86590524
	1	33652	40529	0.8303	27655	39909	0.6929	33571.5	40216	0.83477969	27574.5	39596	0.696396101
	2	20312	10926	1.859	28527	50268	0.5675	20231.5	10613	1.90629417	28446.5	49955	0.569442498
	3	15589	14289	1.091	58535	35396	1.6537	15508.5	13976	1.10965226	58454.5	35083	1.666177351
	4	369716	328455	1.125621	298044	205745	1.448609	369635.5	328142	1.12644983	297963.5	205432	1.450423985
	5	373088	136827	2.7267	175026	243732	0.718108	373007.5	136514	2.73237543	174945.5	243419	0.718701087
	6	243357	333350	0.730034	255542	345779	0.739033	243276.5	333037	0.7304789	255461.5	345466	0.739469297

Label	#												
Average		175952.3	144062.7	1.393776	140554.8	153471.5	0.969975	175871.8	143749.7	1.40667171	140474.3	153158.5	0.973435053
	1	12830	14306	0.8968	14247	16110	0.8844	12749.5	13993	0.91113414	14166.5	15797	0.8967842
	2	10478	6869	1.5253	31324	102842	0.3046	10397.5	6556	1.5859518	31243.5	102529	0.304728418
	3	4991	5175	0.9644	20529	36355	0.5647	4910.5	4862	1.00997532	20448.5	36042	0.567351978
	4	33856	51207	0.6612	53126	62072	0.8559	33775.5	50894	0.66364404	53045.5	61759	0.858911252
	5	40201	42873	0.9377	63859	135990	0.4696	40120.5	42560	0.94268092	63778.5	135677	0.470075989
	6	21662	66147	0.3275	31375	89199	0.3517	21581.5	65834	0.32781693	31294.5	88886	0.352074567
Average		20669.67	31096.17	0.885483	35743.33	73761.33	0.571817	20589.17	30783.17	0.90686719	35662.83	73448.33	0.574987734
	1	18880	20539	0.9192	21691	25812	0.8404	18799.5	20226	0.92947197	21610.5	25499	0.847503824
	2	40044	25675	1.5596	35601	44502	0.8	39963.5	25362	1.57572352	35520.5	44189	0.80383127
	3	25375	26234	0.9673	26773	38238	0.7002	25294.5	25921	0.97583041	26692.5	37925	0.703823336
	4	146122	89068	1.6406	68960	69715	0.9892	146041.5	88755	1.64544533	68879.5	69402	0.992471399
	5	72398	33414	2.1667	101989	103903	0.9816	72317.5	33101	2.18475273	101908.5	103590	0.983767738
	6	105578	57938	1.8222	109402	155194	0.7049	105497.5	57625	1.83075922	109321.5	154881	0.705841904
Average		68066.17	42144.67	1.5126	60736	72894	0.83605	67985.67	41831.67	1.52366386	60655.5	72581	0.839539912
	1	81	297	0.272727									
	2	80	329	0.2446									
Average		80.5	313	0.258664									

APPENDIX C

RAW DATA OF STATISTIC ANALYSIS

1. Statistic analysis of T_3-dependent transactivation assays by ANOVA

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
NOT3	negative control	6	.2246	.11229	.04584	.1068	.3425	.06	.39
	wild-type	6	.2044	.08970	.03662	.1103	.2986	.09	.35
	I276L	6	.1366	.04676	.01909	.0875	.1857	.07	.19
	I280S	6	.3798	.29720	.12133	.0679	.6917	.11	.95
	M313T	6	.3650	.23246	.09490	.1210	.6089	.15	.72
	R316H	6	.1863	.05846	.02386	.1250	.2477	.12	.27
	L330S	6	.2944	.12903	.05268	.1590	.4298	.16	.48
	G344A	6	.2756	.14683	.05994	.1215	.4297	.12	.50
	G345R	6	.2039	.09900	.04042	.1000	.3078	.10	.33
	M442T	6	.1912	.10235	.04178	.0838	.2986	.09	.32
	Total	60	.2462	.15849	.02046	.2053	.2871	.06	.95
T3	negative control	6	.2219	.09261	.03781	.1247	.3191	.10	.33
	wild-type	6	6.3739	1.65388	.67519	4.6383	8.1096	4.30	9.01
	I276L	6	4.6512	1.40748	.57460	3.1741	6.1282	3.28	7.12
	I280S	6	.5157	.26744	.10918	.2350	.7963	.18	.93
	M313T	6	.4073	.07995	.03264	.3234	.4912	.34	.53

R316H	6	1.3580	.48972	.19993	.8441	1.8720	.78	2.04
L330S	6	.4111	.22471	.09174	.1752	.6469	.19	.72
G344A	6	7.3146	2.82791	1.15449	4.3469	10.2824	4.46	12.47
G345R	6	.2744	.16612	.06782	.1000	.4487	.09	.48
M442T	6	.9932	.39782	.16241	.5757	1.4107	.52	1.59
Total	60	2.2521	2.84628	.36745	1.5169	2.9874	.09	12.47

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
NOT3	2.368	9	50	.026
T3	5.128	9	50	.000

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
NOT3	Between Groups	.347	9	.039	1.695	.115
	Within Groups	1.136	50	.023		
	Total	1.482	59			
T3	Between Groups	411.597	9	45.733	34.448	.000
	Within Groups	66.380	50	1.328		
	Total	477.977	59			

Multiple Comparisons

Dependent Variable		(I) CODE	(J) CODE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
NOT3	LSD	negative control	wild-type	.0202	.08701	.818	-.1546	.1949
			I276L	.0880	.08701	.317	-.0867	.2628
			I280S	-.1552	.08701	.081	-.3299	.0196
			M313T	-.1404	.08701	.113	-.3151	.0344
			R316H	.0383	.08701	.662	-.1365	.2131
			L330S	-.0698	.08701	.426	-.2446	.1050
			G344A	-.0510	.08701	.561	-.2257	.1238
			G345R	.0207	.08701	.813	-.1540	.1955
			M442T	.0334	.08701	.703	-.1414	.2081
		wild-type	negative control	-.0202	.08701	.818	-.1949	.1546
			I276L	.0678	.08701	.439	-.1069	.2426
			I280S	-.1753(*)	.08701	.049	-.3501	-.0006
			M313T	-.1605	.08701	.071	-.3353	.0142
			R316H	.0181	.08701	.836	-.1566	.1929
			L330S	-.0900	.08701	.306	-.2647	.0848
			G344A	-.0711	.08701	.417	-.2459	.1036
			G345R	.0005	.08701	.995	-.1742	.1753
			M442T	.0132	.08701	.880	-.1616	.1880
		I276L	negative control	-.0880	.08701	.317	-.2628	.0867
			wild-type	-.0678	.08701	.439	-.2426	.1069
			I280S	-.2432(*)	.08701	.007	-.4179	-.0684
			M313T	-.2284(*)	.08701	.011	-.4031	-.0536
			R316H	-.0497	.08701	.570	-.2245	.1250
			L330S	-.1578	.08701	.076	-.3326	.0169
			G344A	-.1390	.08701	.116	-.3137	.0358

	G345R	-.0673	.08701	.443	-.2421	.1075
	M442T	-.0546	.08701	.533	-.2294	.1201
I280S	negative control	.1552	.08701	.081	-.0196	.3299
	wild-type	.1753(*)	.08701	.049	.0006	.3501
	I276L	.2432(*)	.08701	.007	.0684	.4179
	M313T	.0148	.08701	.866	-.1600	.1896
	R316H	.1935(*)	.08701	.031	.0187	.3682
	L330S	.0854	.08701	.331	-.0894	.2601
	G344A	.1042	.08701	.237	-.0706	.2789
	G345R	.1759(*)	.08701	.049	.0011	.3506
	M442T	.1885(*)	.08701	.035	.0138	.3633
M313T	negative control	.1404	.08701	.113	-.0344	.3151
	wild-type	.1605	.08701	.071	-.0142	.3353
	I276L	.2284(*)	.08701	.011	.0536	.4031
	I280S	-.0148	.08701	.866	-.1896	.1600
	R316H	.1787(*)	.08701	.045	.0039	.3534
	L330S	.0705	.08701	.421	-.1042	.2453
	G344A	.0894	.08701	.309	-.0854	.2641
	G345R	.1611	.08701	.070	-.0137	.3358
	M442T	.1737	.08701	.051	-.0010	.3485
R316H	negative control	-.0383	.08701	.662	-.2131	.1365
	wild-type	-.0181	.08701	.836	-.1929	.1566
	I276L	.0497	.08701	.570	-.1250	.2245
	I280S	-.1935(*)	.08701	.031	-.3682	-.0187
	M313T	-.1787(*)	.08701	.045	-.3534	-.0039
	L330S	-.1081	.08701	.220	-.2829	.0667
	G344A	-.0893	.08701	.310	-.2640	.0855
	G345R	-.0176	.08701	.841	-.1923	.1572
	M442T	-.0049	.08701	.955	-.1797	.1698
L330S	negative control	.0698	.08701	.426	-.1050	.2446
	wild-type	.0900	.08701	.306	-.0848	.2647

	I276L	.1578	.08701	.076	-.0169	.3326
	I280S	-.0854	.08701	.331	-.2601	.0894
	M313T	-.0705	.08701	.421	-.2453	.1042
	R316H	.1081	.08701	.220	-.0667	.2829
	G344A	.0188	.08701	.830	-.1559	.1936
	G345R	.0905	.08701	.303	-.0842	.2653
	M442T	.1032	.08701	.241	-.0716	.2780
G344A	negative control	.0510	.08701	.561	-.1238	.2257
	wild-type	.0711	.08701	.417	-.1036	.2459
	I276L	.1390	.08701	.116	-.0358	.3137
	I280S	-.1042	.08701	.237	-.2789	.0706
	M313T	-.0894	.08701	.309	-.2641	.0854
	R316H	.0893	.08701	.310	-.0855	.2640
	L330S	-.0188	.08701	.830	-.1936	.1559
	G345R	.0717	.08701	.414	-.1031	.2465
	M442T	.0844	.08701	.337	-.0904	.2591
G345R	negative control	-.0207	.08701	.813	-.1955	.1540
	wild-type	-.0005	.08701	.995	-.1753	.1742
	I276L	.0673	.08701	.443	-.1075	.2421
	I280S	-.1759(*)	.08701	.049	-.3506	-.0011
	M313T	-.1611	.08701	.070	-.3358	.0137
	R316H	.0176	.08701	.841	-.1572	.1923
	L330S	-.0905	.08701	.303	-.2653	.0842
	G344A	-.0717	.08701	.414	-.2465	.1031
	M442T	.0127	.08701	.885	-.1621	.1874
M442T	negative control	-.0334	.08701	.703	-.2081	.1414
	wild-type	-.0132	.08701	.880	-.1880	.1616
	I276L	.0546	.08701	.533	-.1201	.2294
	I280S	-.1885(*)	.08701	.035	-.3633	-.0138
	M313T	-.1737	.08701	.051	-.3485	.0010

		R316H	.0049	.08701	.955	-.1698	.1797
		L330S	-.1032	.08701	.241	-.2780	.0716
		G344A	-.0844	.08701	.337	-.2591	.0904
		G345R	-.0127	.08701	.885	-.1874	.1621
Bonferroni	negative control	wild-type	.0202	.08701	1.000	-.2809	.3213
		I276L	.0880	.08701	1.000	-.2131	.3891
		I280S	-.1552	.08701	1.000	-.4563	.1460
		M313T	-.1404	.08701	1.000	-.4415	.1608
		R316H	.0383	.08701	1.000	-.2628	.3394
		L330S	-.0698	.08701	1.000	-.3709	.2313
		G344A	-.0510	.08701	1.000	-.3521	.2501
		G345R	.0207	.08701	1.000	-.2804	.3218
		M442T	.0334	.08701	1.000	-.2677	.3345
	wild-type	negative control	-.0202	.08701	1.000	-.3213	.2809
		I276L	.0678	.08701	1.000	-.2333	.3690
		I280S	-.1753	.08701	1.000	-.4765	.1258
		M313T	-.1605	.08701	1.000	-.4617	.1406
		R316H	.0181	.08701	1.000	-.2830	.3192
		L330S	-.0900	.08701	1.000	-.3911	.2111
		G344A	-.0711	.08701	1.000	-.3723	.2300
		G345R	.0005	.08701	1.000	-.3006	.3017
		M442T	.0132	.08701	1.000	-.2879	.3143
	I276L	negative control	-.0880	.08701	1.000	-.3891	.2131
		wild-type	-.0678	.08701	1.000	-.3690	.2333
		I280S	-.2432	.08701	.331	-.5443	.0580
		M313T	-.2284	.08701	.516	-.5295	.0728
		R316H	-.0497	.08701	1.000	-.3508	.2514
		L330S	-.1578	.08701	1.000	-.4589	.1433
		G344A	-.1390	.08701	1.000	-.4401	.1621
		G345R	-.0673	.08701	1.000	-.3684	.2338
		M442T	-.0546	.08701	1.000	-.3558	.2465

I280S	negative control	.1552	.08701	1.000	-.1460	.4563
	wild-type	.1753	.08701	1.000	-.1258	.4765
	I276L	.2432	.08701	.331	-.0580	.5443
	M313T	.0148	.08701	1.000	-.2863	.3159
	R316H	.1935	.08701	1.000	-.1077	.4946
	L330S	.0854	.08701	1.000	-.2158	.3865
	G344A	.1042	.08701	1.000	-.1969	.4053
	G345R	.1759	.08701	1.000	-.1252	.4770
	M442T	.1885	.08701	1.000	-.1126	.4897
M313T	negative control	.1404	.08701	1.000	-.1608	.4415
	wild-type	.1605	.08701	1.000	-.1406	.4617
	I276L	.2284	.08701	.516	-.0728	.5295
	I280S	-.0148	.08701	1.000	-.3159	.2863
	R316H	.1787	.08701	1.000	-.1225	.4798
	L330S	.0705	.08701	1.000	-.2306	.3717
	G344A	.0894	.08701	1.000	-.2117	.3905
	G345R	.1611	.08701	1.000	-.1401	.4622
	M442T	.1737	.08701	1.000	-.1274	.4749
R316H	negative control	-.0383	.08701	1.000	-.3394	.2628
	wild-type	-.0181	.08701	1.000	-.3192	.2830
	I276L	.0497	.08701	1.000	-.2514	.3508
	I280S	-.1935	.08701	1.000	-.4946	.1077
	M313T	-.1787	.08701	1.000	-.4798	.1225
	L330S	-.1081	.08701	1.000	-.4092	.1930
	G344A	-.0893	.08701	1.000	-.3904	.2119
	G345R	-.0176	.08701	1.000	-.3187	.2835
	M442T	-.0049	.08701	1.000	-.3060	.2962
L330S	negative control	.0698	.08701	1.000	-.2313	.3709
	wild-type	.0900	.08701	1.000	-.2111	.3911
	I276L	.1578	.08701	1.000	-.1433	.4589
	I280S	-.0854	.08701	1.000	-.3865	.2158

	M313T	-.0705	.08701	1.000	-.3717	.2306
	R316H	.1081	.08701	1.000	-.1930	.4092
	G344A	.0188	.08701	1.000	-.2823	.3200
	G345R	.0905	.08701	1.000	-.2106	.3916
	M442T	.1032	.08701	1.000	-.1979	.4043
G344A	negative control	.0510	.08701	1.000	-.2501	.3521
	wild-type	.0711	.08701	1.000	-.2300	.3723
	I276L	.1390	.08701	1.000	-.1621	.4401
	I280S	-.1042	.08701	1.000	-.4053	.1969
	M313T	-.0894	.08701	1.000	-.3905	.2117
	R316H	.0893	.08701	1.000	-.2119	.3904
	L330S	-.0188	.08701	1.000	-.3200	.2823
	G345R	.0717	.08701	1.000	-.2294	.3728
	M442T	.0844	.08701	1.000	-.2168	.3855
G345R	negative control	-.0207	.08701	1.000	-.3218	.2804
	wild-type	-.0005	.08701	1.000	-.3017	.3006
	I276L	.0673	.08701	1.000	-.2338	.3684
	I280S	-.1759	.08701	1.000	-.4770	.1252
	M313T	-.1611	.08701	1.000	-.4622	.1401
	R316H	.0176	.08701	1.000	-.2835	.3187
	L330S	-.0905	.08701	1.000	-.3916	.2106
	G344A	-.0717	.08701	1.000	-.3728	.2294
	M442T	.0127	.08701	1.000	-.2885	.3138
M442T	negative control	-.0334	.08701	1.000	-.3345	.2677
	wild-type	-.0132	.08701	1.000	-.3143	.2879
	I276L	.0546	.08701	1.000	-.2465	.3558
	I280S	-.1885	.08701	1.000	-.4897	.1126
	M313T	-.1737	.08701	1.000	-.4749	.1274
	R316H	.0049	.08701	1.000	-.2962	.3060
	L330S	-.1032	.08701	1.000	-.4043	.1979
	G344A	-.0844	.08701	1.000	-.3855	.2168

			G345R	-.0127	.08701	1.000	-.3138	.2885
T3	LSD	negative control	wild-type	-6.1520(*)	.66523	.000	-7.4882	-4.8159
			I276L	-4.4293(*)	.66523	.000	-5.7655	-3.0931
			I280S	-.2938	.66523	.661	-1.6300	1.0423
			M313T	-.1854	.66523	.782	-1.5216	1.1507
			R316H	-1.1362	.66523	.094	-2.4723	.2000
			L330S	-.1892	.66523	.777	-1.5254	1.1470
			G344A	-7.0928(*)	.66523	.000	-8.4289	-5.7566
			G345R	-.0525	.66523	.937	-1.3887	1.2836
			M442T	-.7714	.66523	.252	-2.1075	.5648
		wild-type	negative control	6.1520(*)	.66523	.000	4.8159	7.4882
			I276L	1.7227(*)	.66523	.013	.3866	3.0589
			I280S	5.8582(*)	.66523	.000	4.5221	7.1944
			M313T	5.9666(*)	.66523	.000	4.6305	7.3028
			R316H	5.0159(*)	.66523	.000	3.6797	6.3520
			L330S	5.9628(*)	.66523	.000	4.6267	7.2990
			G344A	-.9407	.66523	.164	-2.2769	.3954
			G345R	6.0995(*)	.66523	.000	4.7634	7.4357
			M442T	5.3807(*)	.66523	.000	4.0445	6.7168
		I276L	negative control	4.4293(*)	.66523	.000	3.0931	5.7655
			wild-type	-1.7227(*)	.66523	.013	-3.0589	-.3866
			I280S	4.1355(*)	.66523	.000	2.7993	5.4716
			M313T	4.2439(*)	.66523	.000	2.9077	5.5800
			R316H	3.2931(*)	.66523	.000	1.9570	4.6293
			L330S	4.2401(*)	.66523	.000	2.9039	5.5763
			G344A	-2.6635(*)	.66523	.000	-3.9996	-1.3273
			G345R	4.3768(*)	.66523	.000	3.0406	5.7129
			M442T	3.6579(*)	.66523	.000	2.3218	4.9941
		I280S	negative control	.2938	.66523	.661	-1.0423	1.6300
			wild-type	-5.8582(*)	.66523	.000	-7.1944	-4.5221
			I276L	-4.1355(*)	.66523	.000	-5.4716	-2.7993

	M313T	.1084	.66523	.871	-1.2278	1.4446
	R316H	-.8424	.66523	.211	-2.1785	.4938
	L330S	.1046	.66523	.876	-1.2315	1.4408
	G344A	-6.7990(*)	.66523	.000	-8.1351	-5.4628
	G345R	.2413	.66523	.718	-1.0949	1.5775
	M442T	-.4776	.66523	.476	-1.8137	.8586
M313T	negative control	.1854	.66523	.782	-1.1507	1.5216
	wild-type	-5.9666(*)	.66523	.000	-7.3028	-4.6305
	I276L	-4.2439(*)	.66523	.000	-5.5800	-2.9077
	I280S	-.1084	.66523	.871	-1.4446	1.2278
	R316H	-.9508	.66523	.159	-2.2869	.3854
	L330S	-.0038	.66523	.995	-1.3399	1.3324
	G344A	-6.9074(*)	.66523	.000	-8.2435	-5.5712
	G345R	.1329	.66523	.842	-1.2033	1.4691
	M442T	-.5859	.66523	.383	-1.9221	.7502
R316H	negative control	1.1362	.66523	.094	-.2000	2.4723
	wild-type	-5.0159(*)	.66523	.000	-6.3520	-3.6797
	I276L	-3.2931(*)	.66523	.000	-4.6293	-1.9570
	I280S	.8424	.66523	.211	-.4938	2.1785
	M313T	.9508	.66523	.159	-.3854	2.2869
	L330S	.9470	.66523	.161	-.3892	2.2831
	G344A	-5.9566(*)	.66523	.000	-7.2928	-4.6204
	G345R	1.0837	.66523	.110	-.2525	2.4198
	M442T	.3648	.66523	.586	-.9714	1.7010
L330S	negative control	.1892	.66523	.777	-1.1470	1.5254
	wild-type	-5.9628(*)	.66523	.000	-7.2990	-4.6267
	I276L	-4.2401(*)	.66523	.000	-5.5763	-2.9039
	I280S	-.1046	.66523	.876	-1.4408	1.2315
	M313T	.0038	.66523	.995	-1.3324	1.3399
	R316H	-.9470	.66523	.161	-2.2831	.3892
	G344A	-6.9036(*)	.66523	.000	-8.2397	-5.5674

		G345R	.1367	.66523	.838	-1.1995	1.4728
		M442T	-.5822	.66523	.386	-1.9183	.7540
	G344A	negative control	7.0928(*)	.66523	.000	5.7566	8.4289
		wild-type	.9407	.66523	.164	-.3954	2.2769
		I276L	2.6635(*)	.66523	.000	1.3273	3.9996
		I280S	6.7990(*)	.66523	.000	5.4628	8.1351
		M313T	6.9074(*)	.66523	.000	5.5712	8.2435
		R316H	5.9566(*)	.66523	.000	4.6204	7.2928
		L330S	6.9036(*)	.66523	.000	5.5674	8.2397
		G345R	7.0403(*)	.66523	.000	5.7041	8.3764
		M442T	6.3214(*)	.66523	.000	4.9853	7.6576
	G345R	negative control	.0525	.66523	.937	-1.2836	1.3887
		wild-type	-6.0995(*)	.66523	.000	-7.4357	-4.7634
		I276L	-4.3768(*)	.66523	.000	-5.7129	-3.0406
		I280S	-.2413	.66523	.718	-1.5775	1.0949
		M313T	-.1329	.66523	.842	-1.4691	1.2033
		R316H	-1.0837	.66523	.110	-2.4198	.2525
		L330S	-.1367	.66523	.838	-1.4728	1.1995
		G344A	-7.0403(*)	.66523	.000	-8.3764	-5.7041
		M442T	-.7189	.66523	.285	-2.0550	.6173
	M442T	negative control	.7714	.66523	.252	-.5648	2.1075
		wild-type	-5.3807(*)	.66523	.000	-6.7168	-4.0445
		I276L	-3.6579(*)	.66523	.000	-4.9941	-2.3218
		I280S	.4776	.66523	.476	-.8586	1.8137
		M313T	.5859	.66523	.383	-.7502	1.9221
		R316H	-.3648	.66523	.586	-1.7010	.9714
		L330S	.5822	.66523	.386	-.7540	1.9183
		G344A	-6.3214(*)	.66523	.000	-7.6576	-4.9853
		G345R	.7189	.66523	.285	-.6173	2.0550
Bonferroni	negative control	wild-type	-6.1520(*)	.66523	.000	-8.4543	-3.8498
		I276L	-4.4293(*)	.66523	.000	-6.7316	-2.1270

	I280S	-.2938	.66523	1.000	-2.5961	2.0085
	M313T	-.1854	.66523	1.000	-2.4877	2.1169
	R316H	-1.1362	.66523	1.000	-3.4385	1.1661
	L330S	-.1892	.66523	1.000	-2.4915	2.1131
	G344A	-7.0928(*)	.66523	.000	-9.3951	-4.7905
	G345R	-.0525	.66523	1.000	-2.3548	2.2498
	M442T	-.7714	.66523	1.000	-3.0737	1.5309
wild-type	negative control	6.1520(*)	.66523	.000	3.8498	8.4543
	I276L	1.7227	.66523	.565	-.5795	4.0250
	I280S	5.8582(*)	.66523	.000	3.5559	8.1605
	M313T	5.9666(*)	.66523	.000	3.6643	8.2689
	R316H	5.0159(*)	.66523	.000	2.7136	7.3182
	L330S	5.9628(*)	.66523	.000	3.6606	8.2651
	G344A	-.9407	.66523	1.000	-3.2430	1.3616
	G345R	6.0995(*)	.66523	.000	3.7972	8.4018
	M442T	5.3807(*)	.66523	.000	3.0784	7.6830
I276L	negative control	4.4293(*)	.66523	.000	2.1270	6.7316
	wild-type	-1.7227	.66523	.565	-4.0250	.5795
	I280S	4.1355(*)	.66523	.000	1.8332	6.4378
	M313T	4.2439(*)	.66523	.000	1.9416	6.5462
	R316H	3.2931(*)	.66523	.000	.9908	5.5954
	L330S	4.2401(*)	.66523	.000	1.9378	6.5424
	G344A	-2.6635(*)	.66523	.009	-4.9658	-.3612
	G345R	4.3768(*)	.66523	.000	2.0745	6.6791
	M442T	3.6579(*)	.66523	.000	1.3556	5.9602
I280S	negative control	.2938	.66523	1.000	-2.0085	2.5961
	wild-type	-5.8582(*)	.66523	.000	-8.1605	-3.5559
	I276L	-4.1355(*)	.66523	.000	-6.4378	-1.8332
	M313T	.1084	.66523	1.000	-2.1939	2.4107
	R316H	-.8424	.66523	1.000	-3.1446	1.4599
	L330S	.1046	.66523	1.000	-2.1977	2.4069

		G344A	-6.7990(*)	.66523	.000	-9.1013	-4.4967
		G345R	.2413	.66523	1.000	-2.0610	2.5436
		M442T	-.4776	.66523	1.000	-2.7798	1.8247
M313T	negative control	.1854	.66523	1.000	-2.1169	2.4877
	wild-type	-5.9666(*)	.66523	.000	-8.2689	-3.6643
	I276L	-4.2439(*)	.66523	.000	-6.5462	-1.9416
	I280S	-.1084	.66523	1.000	-2.4107	2.1939
	R316H	-.9508	.66523	1.000	-3.2530	1.3515
	L330S	-.0038	.66523	1.000	-2.3061	2.2985
	G344A	-6.9074(*)	.66523	.000	-9.2096	-4.6051
	G345R	.1329	.66523	1.000	-2.1694	2.4352
	M442T	-.5859	.66523	1.000	-2.8882	1.7163
R316H	negative control	1.1362	.66523	1.000	-1.1661	3.4385
	wild-type	-5.0159(*)	.66523	.000	-7.3182	-2.7136
	I276L	-3.2931(*)	.66523	.000	-5.5954	-.9908
	I280S	.8424	.66523	1.000	-1.4599	3.1446
	M313T	.9508	.66523	1.000	-1.3515	3.2530
	L330S	.9470	.66523	1.000	-1.3553	3.2493
	G344A	-5.9566(*)	.66523	.000	-8.2589	-3.6543
	G345R	1.0837	.66523	1.000	-1.2186	3.3859
	M442T	.3648	.66523	1.000	-1.9375	2.6671
L330S	negative control	.1892	.66523	1.000	-2.1131	2.4915
	wild-type	-5.9628(*)	.66523	.000	-8.2651	-3.6606
	I276L	-4.2401(*)	.66523	.000	-6.5424	-1.9378
	I280S	-.1046	.66523	1.000	-2.4069	2.1977
	M313T	.0038	.66523	1.000	-2.2985	2.3061
	R316H	-.9470	.66523	1.000	-3.2493	1.3553
	G344A	-6.9036(*)	.66523	.000	-9.2059	-4.6013
	G345R	.1367	.66523	1.000	-2.1656	2.4390
	M442T	-.5822	.66523	1.000	-2.8845	1.7201
G344A	negative control	7.0928(*)	.66523	.000	4.7905	9.3951

	wild-type	.9407	.66523	1.000	-1.3616	3.2430
	I276L	2.6635(*)	.66523	.009	.3612	4.9658
	I280S	6.7990(*)	.66523	.000	4.4967	9.1013
	M313T	6.9074(*)	.66523	.000	4.6051	9.2096
	R316H	5.9566(*)	.66523	.000	3.6543	8.2589
	L330S	6.9036(*)	.66523	.000	4.6013	9.2059
	G345R	7.0403(*)	.66523	.000	4.7380	9.3426
	M442T	6.3214(*)	.66523	.000	4.0191	8.6237
G345R	negative control	.0525	.66523	1.000	-2.2498	2.3548
	wild-type	-6.0995(*)	.66523	.000	-8.4018	-3.7972
	I276L	-4.3768(*)	.66523	.000	-6.6791	-2.0745
	I280S	-.2413	.66523	1.000	-2.5436	2.0610
	M313T	-.1329	.66523	1.000	-2.4352	2.1694
	R316H	-1.0837	.66523	1.000	-3.3859	1.2186
	L330S	-.1367	.66523	1.000	-2.4390	2.1656
	G344A	-7.0403(*)	.66523	.000	-9.3426	-4.7380
	M442T	-.7189	.66523	1.000	-3.0211	1.5834
M442T	negative control	.7714	.66523	1.000	-1.5309	3.0737
	wild-type	-5.3807(*)	.66523	.000	-7.6830	-3.0784
	I276L	-3.6579(*)	.66523	.000	-5.9602	-1.3556
	I280S	.4776	.66523	1.000	-1.8247	2.7798
	M313T	.5859	.66523	1.000	-1.7163	2.8882
	R316H	-.3648	.66523	1.000	-2.6671	1.9375
	L330S	.5822	.66523	1.000	-1.7201	2.8845
	G344A	-6.3214(*)	.66523	.000	-8.6237	-4.0191
	G345R	.7189	.66523	1.000	-1.5834	3.0211

* The mean difference is significant at the .05 level.

2. Statistic analysis of dominant negative effect (DNE) by ANOVA

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
ONE	Negative control	6	.6064	.20090	.08202	.3956	.8172	.37	.92
	WT:WT	6	9.3732	2.10805	.86061	7.1609	11.5855	5.73	11.64
	WT:I276L	6	2.1140	1.17694	.48048	.8789	3.3491	1.15	4.37
	WT:I280S	6	3.0256	2.11694	.86424	.8040	5.2472	1.08	5.32
	WT:M313T	6	1.1583	.62090	.25348	.5067	1.8099	.39	2.14
	WT:R316H	6	1.8855	1.10170	.44977	.7293	3.0416	.81	3.52
	WT:L330S	6	1.0985	.28637	.11691	.7980	1.3990	.82	1.62
	WT:G344A	6	1.4067	.76918	.31401	.5995	2.2139	.73	2.73
	WT:G345R	6	.9069	.41654	.17005	.4697	1.3440	.33	1.59
	WT:M442T	6	1.5237	.49032	.20017	1.0091	2.0382	.93	2.18
	Total	60	2.3099	2.67918	.34588	1.6178	3.0020	.33	11.64
FOUR	Negative control	6	.6064	.20090	.08202	.3956	.8172	.37	.92
	WT:WT	6	9.3732	2.10805	.86061	7.1609	11.5855	5.73	11.64
	WT:I276L	6	1.4991	.46251	.18882	1.0138	1.9845	.87	2.01
	WT:I280S	6	1.8486	1.59228	.65005	.1776	3.5196	.68	4.67
	WT:M313T	6	.5545	.19011	.07761	.3550	.7540	.36	.84
	WT:R316H	6	1.2039	.83556	.34112	.3270	2.0808	.22	2.47
	WT:L330S	6	.8659	.59727	.24384	.2391	1.4927	.15	1.83
	WT:G344A	6	.9734	.46195	.18859	.4886	1.4582	.57	1.67
	WT:G345R	6	.5750	.25217	.10295	.3103	.8396	.30	.90
	WT:M442T	6	.8395	.12792	.05222	.7053	.9738	.70	.99
	Total	60	1.8340	2.70454	.34915	1.1353	2.5326	.15	11.64

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
ONE	6.952	9	50	.000
FOUR	5.512	9	50	.000

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
ONE	Between Groups	358.313	9	39.813	30.537	.000
	Within Groups	65.188	50	1.304		
	Total	423.501	59			
FOUR	Between Groups	388.469	9	43.163	50.086	.000
	Within Groups	43.089	50	.862		
	Total	431.558	59			

Multiple Comparisons

Dependent Variable		(I) CODE	(J) CODE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
ONE	LSD	Negative control	WT:WT	-8.7668(*)	.65923	.000	-10.0909	-7.4427
			WT:I276L	-1.5076(*)	.65923	.026	-2.8317	-.1835

	WT:I280S	-2.4192(*)	.65923	.001	-3.7433	-1.0951
	WT:M313T	-.5519	.65923	.406	-1.8760	.7722
	WT:R316H	-1.2791	.65923	.058	-2.6032	.0450
	WT:L330S	-.4921	.65923	.459	-1.8162	.8320
	WT:G344A	-.8003	.65923	.230	-2.1244	.5238
	WT:G345R	-.3005	.65923	.651	-1.6246	1.0236
	WT:M442T	-.9173	.65923	.170	-2.2414	.4068
WT:WT	Negative control	8.7668(*)	.65923	.000	7.4427	10.0909
	WT:I276L	7.2592(*)	.65923	.000	5.9351	8.5833
	WT:I280S	6.3476(*)	.65923	.000	5.0235	7.6717
	WT:M313T	8.2149(*)	.65923	.000	6.8908	9.5390
	WT:R316H	7.4877(*)	.65923	.000	6.1636	8.8118
	WT:L330S	8.2747(*)	.65923	.000	6.9506	9.5988
	WT:G344A	7.9665(*)	.65923	.000	6.6424	9.2906
	WT:G345R	8.4663(*)	.65923	.000	7.1422	9.7904
	WT:M442T	7.8495(*)	.65923	.000	6.5254	9.1736
WT:I276L	Negative control	1.5076(*)	.65923	.026	.1835	2.8317
	WT:WT	-7.2592(*)	.65923	.000	-8.5833	-5.9351
	WT:I280S	-.9115	.65923	.173	-2.2357	.4126
	WT:M313T	.9557	.65923	.153	-.3684	2.2798
	WT:R316H	.2285	.65923	.730	-1.0956	1.5527
	WT:L330S	1.0155	.65923	.130	-.3086	2.3396
	WT:G344A	.7074	.65923	.288	-.6168	2.0315
	WT:G345R	1.2072	.65923	.073	-.1170	2.5313
	WT:M442T	.5904	.65923	.375	-.7337	1.9145
WT:I280S	Negative control	2.4192(*)	.65923	.001	1.0951	3.7433
	WT:WT	-6.3476(*)	.65923	.000	-7.6717	-5.0235
	WT:I276L	.9115	.65923	.173	-.4126	2.2357
	WT:M313T	1.8673(*)	.65923	.007	.5432	3.1914
	WT:R316H	1.1401	.65923	.090	-.1840	2.4642
	WT:L330S	1.9271(*)	.65923	.005	.6029	3.2512

		WT:G344A	1.6189(*)	.65923	.018	.2948	2.9430
		WT:G345R	2.1187(*)	.65923	.002	.7946	3.4428
		WT:M442T	1.5019(*)	.65923	.027	.1778	2.8260
WT:M313T	Negative control	.5519	.65923	.406	-.7722	1.8760
	WT:WT	-8.2149(*)	.65923	.000	-9.5390	-6.8908
	WT:I276L	-.9557	.65923	.153	-2.2798	.3684
	WT:I280S	-1.8673(*)	.65923	.007	-3.1914	-.5432
	WT:R316H	-.7272	.65923	.275	-2.0513	.5969
	WT:L330S	.0598	.65923	.928	-1.2643	1.3839
	WT:G344A	-.2484	.65923	.708	-1.5725	1.0757
	WT:G345R	.2514	.65923	.705	-1.0727	1.5755
	WT:M442T	-.3654	.65923	.582	-1.6895	.9587
WT:R316H	Negative control	1.2791	.65923	.058	-.0450	2.6032
	WT:WT	-7.4877(*)	.65923	.000	-8.8118	-6.1636
	WT:I276L	-.2285	.65923	.730	-1.5527	1.0956
	WT:I280S	-1.1401	.65923	.090	-2.4642	.1840
	WT:M313T	.7272	.65923	.275	-.5969	2.0513
	WT:L330S	.7870	.65923	.238	-.5371	2.1111
	WT:G344A	.4788	.65923	.471	-.8453	1.8029
	WT:G345R	.9786	.65923	.144	-.3455	2.3027
	WT:M442T	.3618	.65923	.586	-.9623	1.6859
WT:L330S	Negative control	.4921	.65923	.459	-.8320	1.8162
	WT:WT	-8.2747(*)	.65923	.000	-9.5988	-6.9506
	WT:I276L	-1.0155	.65923	.130	-2.3396	.3086
	WT:I280S	-1.9271(*)	.65923	.005	-3.2512	-.6029
	WT:M313T	-.0598	.65923	.928	-1.3839	1.2643
	WT:R316H	-.7870	.65923	.238	-2.1111	.5371
	WT:G344A	-.3082	.65923	.642	-1.6323	1.0160
	WT:G345R	.1916	.65923	.772	-1.1325	1.5158
	WT:M442T	-.4252	.65923	.522	-1.7493	.8990
WT:G344A	Negative control	.8003	.65923	.230	-.5238	2.1244

		WT:WT	-7.9665(*)	.65923	.000	-9.2906	-6.6424
		WT:I276L	-.7074	.65923	.288	-2.0315	.6168
		WT:I280S	-1.6189(*)	.65923	.018	-2.9430	-.2948
		WT:M313T	.2484	.65923	.708	-1.0757	1.5725
		WT:R316H	-.4788	.65923	.471	-1.8029	.8453
		WT:L330S	.3082	.65923	.642	-1.0160	1.6323
		WT:G345R	.4998	.65923	.452	-.8243	1.8239
		WT:M442T	-.1170	.65923	.860	-1.4411	1.2071
	WT:G345R	Negative control	.3005	.65923	.651	-1.0236	1.6246
		WT:WT	-8.4663(*)	.65923	.000	-9.7904	-7.1422
		WT:I276L	-1.2072	.65923	.073	-2.5313	.1170
		WT:I280S	-2.1187(*)	.65923	.002	-3.4428	-.7946
		WT:M313T	-.2514	.65923	.705	-1.5755	1.0727
		WT:R316H	-.9786	.65923	.144	-2.3027	.3455
		WT:L330S	-.1916	.65923	.772	-1.5158	1.1325
		WT:G344A	-.4998	.65923	.452	-1.8239	.8243
		WT:M442T	-.6168	.65923	.354	-1.9409	.7073
	WT:M442T	Negative control	.9173	.65923	.170	-.4068	2.2414
		WT:WT	-7.8495(*)	.65923	.000	-9.1736	-6.5254
		WT:I276L	-.5904	.65923	.375	-1.9145	.7337
		WT:I280S	-1.5019(*)	.65923	.027	-2.8260	-.1778
		WT:M313T	.3654	.65923	.582	-.9587	1.6895
		WT:R316H	-.3618	.65923	.586	-1.6859	.9623
		WT:L330S	.4252	.65923	.522	-.8990	1.7493
		WT:G344A	.1170	.65923	.860	-1.2071	1.4411
		WT:G345R	.6168	.65923	.354	-.7073	1.9409
Bonferroni	Negative control	WT:WT	-8.7668(*)	.65923	.000	-11.0483	-6.4853
		WT:I276L	-1.5076	.65923	1.000	-3.7891	.7739
		WT:I280S	-2.4192(*)	.65923	.027	-4.7007	-.1376
		WT:M313T	-.5519	.65923	1.000	-2.8334	1.7296
		WT:R316H	-1.2791	.65923	1.000	-3.5606	1.0024

	WT:L330S	-.4921	.65923	1.000	-2.7736	1.7894
	WT:G344A	-.8003	.65923	1.000	-3.0818	1.4813
	WT:G345R	-.3005	.65923	1.000	-2.5820	1.9811
	WT:M442T	-.9173	.65923	1.000	-3.1988	1.3643
WT:WT	Negative control	8.7668(*)	.65923	.000	6.4853	11.0483
	WT:I276L	7.2592(*)	.65923	.000	4.9776	9.5407
	WT:I280S	6.3476(*)	.65923	.000	4.0661	8.6291
	WT:M313T	8.2149(*)	.65923	.000	5.9334	10.4964
	WT:R316H	7.4877(*)	.65923	.000	5.2062	9.7692
	WT:L330S	8.2747(*)	.65923	.000	5.9932	10.5562
	WT:G344A	7.9665(*)	.65923	.000	5.6850	10.2480
	WT:G345R	8.4663(*)	.65923	.000	6.1848	10.7478
	WT:M442T	7.8495(*)	.65923	.000	5.5680	10.1310
WT:I276L	Negative control	1.5076	.65923	1.000	-.7739	3.7891
	WT:WT	-7.2592(*)	.65923	.000	-9.5407	-4.9776
	WT:I280S	-.9115	.65923	1.000	-3.1931	1.3700
	WT:M313T	.9557	.65923	1.000	-1.3258	3.2372
	WT:R316H	.2285	.65923	1.000	-2.0530	2.5101
	WT:L330S	1.0155	.65923	1.000	-1.2660	3.2970
	WT:G344A	.7074	.65923	1.000	-1.5742	2.9889
	WT:G345R	1.2072	.65923	1.000	-1.0744	3.4887
	WT:M442T	.5904	.65923	1.000	-1.6912	2.8719
WT:I280S	Negative control	2.4192(*)	.65923	.027	.1376	4.7007
	WT:WT	-6.3476(*)	.65923	.000	-8.6291	-4.0661
	WT:I276L	.9115	.65923	1.000	-1.3700	3.1931
	WT:M313T	1.8673	.65923	.299	-.4143	4.1488
	WT:R316H	1.1401	.65923	1.000	-1.1414	3.4216
	WT:L330S	1.9271	.65923	.234	-.3545	4.2086
	WT:G344A	1.6189	.65923	.791	-.6626	3.9004
	WT:G345R	2.1187	.65923	.103	-.1628	4.4002
	WT:M442T	1.5019	.65923	1.000	-.7796	3.7834

WT:M313T	Negative control	.5519	.65923	1.000	-1.7296	2.8334
	WT:WT	-8.2149(*)	.65923	.000	-10.4964	-5.9334
	WT:I276L	-.9557	.65923	1.000	-3.2372	1.3258
	WT:I280S	-1.8673	.65923	.299	-4.1488	.4143
	WT:R316H	-.7272	.65923	1.000	-3.0087	1.5543
	WT:L330S	.0598	.65923	1.000	-2.2217	2.3413
	WT:G344A	-.2484	.65923	1.000	-2.5299	2.0331
	WT:G345R	.2514	.65923	1.000	-2.0301	2.5330
	WT:M442T	-.3654	.65923	1.000	-2.6469	1.9162
WT:R316H	Negative control	1.2791	.65923	1.000	-1.0024	3.5606
	WT:WT	-7.4877(*)	.65923	.000	-9.7692	-5.2062
	WT:I276L	-.2285	.65923	1.000	-2.5101	2.0530
	WT:I280S	-1.1401	.65923	1.000	-3.4216	1.1414
	WT:M313T	.7272	.65923	1.000	-1.5543	3.0087
	WT:L330S	.7870	.65923	1.000	-1.4946	3.0685
	WT:G344A	.4788	.65923	1.000	-1.8027	2.7603
	WT:G345R	.9786	.65923	1.000	-1.3029	3.2601
	WT:M442T	.3618	.65923	1.000	-1.9197	2.6433
WT:L330S	Negative control	.4921	.65923	1.000	-1.7894	2.7736
	WT:WT	-8.2747(*)	.65923	.000	-10.5562	-5.9932
	WT:I276L	-1.0155	.65923	1.000	-3.2970	1.2660
	WT:I280S	-1.9271	.65923	.234	-4.2086	.3545
	WT:M313T	-.0598	.65923	1.000	-2.3413	2.2217
	WT:R316H	-.7870	.65923	1.000	-3.0685	1.4946
	WT:G344A	-.3082	.65923	1.000	-2.5897	1.9734
	WT:G345R	.1916	.65923	1.000	-2.0899	2.4732
	WT:M442T	-.4252	.65923	1.000	-2.7067	1.8564
WT:G344A	Negative control	.8003	.65923	1.000	-1.4813	3.0818
	WT:WT	-7.9665(*)	.65923	.000	-10.2480	-5.6850
	WT:I276L	-.7074	.65923	1.000	-2.9889	1.5742
	WT:I280S	-1.6189	.65923	.791	-3.9004	.6626

			WT:M313T	.2484	.65923	1.000	-2.0331	2.5299
			WT:R316H	-.4788	.65923	1.000	-2.7603	1.8027
			WT:L330S	.3082	.65923	1.000	-1.9734	2.5897
			WT:G345R	.4998	.65923	1.000	-1.7817	2.7813
			WT:M442T	-.1170	.65923	1.000	-2.3985	2.1645
		WT:G345R	Negative control	.3005	.65923	1.000	-1.9811	2.5820
			WT:WT	-8.4663(*)	.65923	.000	-10.7478	-6.1848
			WT:I276L	-1.2072	.65923	1.000	-3.4887	1.0744
			WT:I280S	-2.1187	.65923	.103	-4.4002	.1628
			WT:M313T	-.2514	.65923	1.000	-2.5330	2.0301
			WT:R316H	-.9786	.65923	1.000	-3.2601	1.3029
			WT:L330S	-.1916	.65923	1.000	-2.4732	2.0899
			WT:G344A	-.4998	.65923	1.000	-2.7813	1.7817
			WT:M442T	-.6168	.65923	1.000	-2.8983	1.6647
		WT:M442T	Negative control	.9173	.65923	1.000	-1.3643	3.1988
			WT:WT	-7.8495(*)	.65923	.000	-10.1310	-5.5680
			WT:I276L	-.5904	.65923	1.000	-2.8719	1.6912
			WT:I280S	-1.5019	.65923	1.000	-3.7834	.7796
			WT:M313T	.3654	.65923	1.000	-1.9162	2.6469
			WT:R316H	-.3618	.65923	1.000	-2.6433	1.9197
			WT:L330S	.4252	.65923	1.000	-1.8564	2.7067
			WT:G344A	.1170	.65923	1.000	-2.1645	2.3985
			WT:G345R	.6168	.65923	1.000	-1.6647	2.8983
FOUR	LSD	Negative control	WT:WT	-8.7668(*)	.53597	.000	-9.8433	-7.6903
			WT:I276L	-.8927	.53597	.102	-1.9693	.1838
			WT:I280S	-1.2422(*)	.53597	.025	-2.3187	-.1657
			WT:M313T	.0519	.53597	.923	-1.0246	1.1284
			WT:R316H	-.5975	.53597	.270	-1.6740	.4790
			WT:L330S	-.2595	.53597	.630	-1.3360	.8170
			WT:G344A	-.3670	.53597	.497	-1.4436	.7095
			WT:G345R	.0314	.53597	.953	-1.0451	1.1079

WT:WT	WT:M442T	-.2331	.53597	.665	-1.3097	.8434
	Negative control	8.7668(*)	.53597	.000	7.6903	9.8433
	WT:I276L	7.8740(*)	.53597	.000	6.7975	8.9506
	WT:I280S	7.5246(*)	.53597	.000	6.4480	8.6011
	WT:M313T	8.8187(*)	.53597	.000	7.7422	9.8952
	WT:R316H	8.1693(*)	.53597	.000	7.0928	9.2458
	WT:L330S	8.5073(*)	.53597	.000	7.4308	9.5838
	WT:G344A	8.3998(*)	.53597	.000	7.3232	9.4763
	WT:G345R	8.7982(*)	.53597	.000	7.7217	9.8747
	WT:M442T	8.5337(*)	.53597	.000	7.4571	9.6102
WT:I276L	Negative control	.8927	.53597	.102	-.1838	1.9693
	WT:WT	-7.8740(*)	.53597	.000	-8.9506	-6.7975
	WT:I280S	-.3495	.53597	.517	-1.4260	.7271
	WT:M313T	.9447	.53597	.084	-.1319	2.0212
	WT:R316H	.2953	.53597	.584	-.7813	1.3718
	WT:L330S	.6332	.53597	.243	-.4433	1.7098
	WT:G344A	.5257	.53597	.331	-.5508	1.6022
	WT:G345R	.9242	.53597	.091	-.1524	2.0007
	WT:M442T	.6596	.53597	.224	-.4169	1.7361
WT:I280S	Negative control	1.2422(*)	.53597	.025	.1657	2.3187
	WT:WT	-7.5246(*)	.53597	.000	-8.6011	-6.4480
	WT:I276L	.3495	.53597	.517	-.7271	1.4260
	WT:M313T	1.2941(*)	.53597	.019	.2176	2.3707
	WT:R316H	.6447	.53597	.235	-.4318	1.7213
	WT:L330S	.9827	.53597	.073	-.0938	2.0592
	WT:G344A	.8752	.53597	.109	-.2013	1.9517
	WT:G345R	1.2736(*)	.53597	.021	.1971	2.3502
	WT:M442T	1.0091	.53597	.066	-.0674	2.0856
WT:M313T	Negative control	-.0519	.53597	.923	-1.1284	1.0246
	WT:WT	-8.8187(*)	.53597	.000	-9.8952	-7.7422
	WT:I276L	-.9447	.53597	.084	-2.0212	.1319

BIOGRAPHY

Name   Miss Sarai Pongjantarasatian

Date of Birth   Febuary 13, 1982

Place of Birth   Phatthalung, Thailand

Institute Attended   Thungsong school, Nakhonsithammarat

                            Certificate of Matayom Suksa 6

                            Faculty of Science

                            Srinakharinwirot University, Bangkok

                            Bachelor's Degree of Science, Majoring in Biology