

# WinNonlin Compartmental Modeling Analysis

Version 4.0.1 Build 200210171634

## User-defined ASCII model:

```
MODEL
remark *****
remark Developer: Pravin Jadhav
remark Model Date: 08-07-2006
remark Model Version: 1.0
remark *****
remark
remark - define model-specific commands
COMMANDS
  NFUNCTIONS 1
  NPARAMETERS 3
  PNames 'Emax', 'EC50', 'Gamma'
END
remark - define temporary variables
TEMPORARY
  Emax=P(1)
  EC50=P(2)
  Gamma=P(3)
  CONC=X
END
remark - define algebraic functions
FUNCTION 1
  F= Emax*CONC**Gamma/(EC50**Gamma+CONC**Gamma)
END
remark - define any secondary parameters
remark - end of model
EOM
```

## Settings for analysis:

Input Workbook: C:\Data\misc\ACCP\_2006\Data\WNLdata\EMAXS.pwo

Input Worksheet: Sheet1

Input Sort Keys: [none]

Gauss-Newton (Levenberg and Hartley) method used

Convergence criteria of 0.0001 used during minimization process

50 maximum iterations allowed during minimization process

**Input data:**

<b>CONC (ng/mL)</b>	<b>EFF ({units})</b>
0	1.76
0	1.43
0	1.15
0	0.92
0	0.73
0	0.58
0	0.45
0	1.62
0	1.31
0	1.76
0.01	2.6
0.01	2.15
0.01	2.42
0.01	1.99
0.01	2.6
0.01	2.15
0.01	2.52
0.02	3.11
0.02	2.91
0.02	3.11
0.02	3.02
0.03	3.67
0.03	3.45
0.03	3.67
0.03	3.57
0.05	4.03
0.05	4.16
0.06	4.27
0.06	4.27
0.08	4.64
0.08	4.78
0.09	4.89
0.09	4.88
0.12	5.27
0.14	5.4
0.15	5.51
0.15	5.51
0.2	5.88
0.23	6.02
0.25	6.12
0.25	6.12
0.34	6.47
0.38	6.6
0.41	6.7
0.41	6.69
0.56	7.02
0.62	7.13
0.67	7.22
0.68	7.22
0.92	7.52
1.02	7.62
1.11	7.69
1.12	7.7
1.51	7.95
1.68	8.04
1.83	8.11
1.84	8.11
2.49	8.33

2.78	8.41
3.02	8.46
3.03	8.46
4.1	8.65
4.58	8.71
4.98	8.76
6.77	8.92
7.55	8.97
8.21	9.01
11.16	9.14
12.45	9.18
13.53	9.21
18.39	9.31
20.52	9.35
22.31	9.37
30.33	9.46
33.83	9.48
36.79	9.5
55.78	9.59
60.65	9.61
91.97	9.68
151.63	9.75

**Output data:**

**Initial Parameters**

Parameter	Value	Lower	Upper
EMAX	10	0	100
EC50	0.1	0	1
GAMMA	0.5	0	5

**Minimization Process**

Iteration	Weighted_SS	Emax	EC50	Gamma
0	16.3377	10	0.1	0.5
1	16.3221	9.976	0.1003	0.5041
2	16.3197	9.984	0.1003	0.5043
2	16.3187	9.978	0.1004	0.5054

**Final Parameters**

E	E	E	E	E	E	E	EC	EC	EC	EC	EC	EC	EC	Ga	Ga	Ga	Ga	Ga	Ga	Ga
m	m	m	m	m	m	m	50	50	50	50	50	50	50	m	m	m	m	m	m	m
ax	ax	ax	ax	ax	ax	ax	_S	_C	_U	_U	_P	_P	m	m	m	m	m	m	m	m
	_S	_C	_U	_U	_P	_P	td	V	ni	ni	la	la	a	a	a	a	a	a	a	a
	Er	%	va	va	na	na	ror	%	rCl	rCl	rCl	rCl	rro	St	CV	Un	Un	PI	PI	PI
	ror		rCl	rCl	rCl	rCl			rCl	rCl	rCl	rCl	r	dE	%	iva	iva	an	an	an
			_L	_U	_L	_U			_L	_U	_L	_U				rCl	rCl	ar	ar	ar
			ow	pp	ow	pp			ow	pp	ow	pp				_L	_U	Cl	Cl	Cl
			er	er	er	er			er	er	er	er				er	er	ow	pp	pp

																			er	er																					
9.9	0.2	2.0	9.5	10.	9.3	10.	0.1	0.0	11.	0.0	0.1	0.0	0.1	0.5	0.0	5.6	0.4	0.5	0.4	0.5	782	050	6	699	386	940	562	003	118	76	768	238	667	340	054	286	8	483	625	237	871
35	59		10	560	62	408	81	01		81	80	61	00	49	90		19	79	16	83																					

### Correlation Matrix

Parameter	Emax	EC50	Gamma
EMAX	1		
EC50	0.855279	1	
GAMMA	-0.801841	-0.623742	1

### Eigenvalues

Number	Value
1	5959
2	725.3
3	4.965

### Condition Numbers

Iteration	Rank	Condition
0	3	16.210448
1	3	16.025368
2	3	16.014537

### Variance-Covariance Matrix

Parameter	Emax	EC50	Gamma
EMAX	4.20E-02		
EC50	2.07E-03	1.39E-04	
GAMMA	-4.72E-03	-2.11E-04	8.23E-04

### Summary Table

CONC_obs (ng/mL)	EFF_obs ({units})	CONC (ng/mL)	EFF ({units})	Predicted ({units})	Residual ({units})	Weight	SE_Yhat	Standard_Res
0	1.76	0.0000	1.7600	0.0000	1.7600	1.0000	Missing	Missing
0	1.43	0.0000	1.4300	0.0000	1.4300	1.0000	Missing	Missing
0	1.15	0.0000	1.1500	0.0000	1.1500	1.0000	Missing	Missing
0	0.92	0.0000	0.9200	0.0000	0.9200	1.0000	Missing	Missing
0	0.73	0.0000	0.7300	0.0000	0.7300	1.0000	Missing	Missing
0	0.58	0.0000	0.5800	0.0000	0.5800	1.0000	Missing	Missing
0	0.45	0.0000	0.4500	0.0000	0.4500	1.0000	Missing	Missing
0	1.62	0.0000	1.6200	0.0000	1.6200	1.0000	Missing	Missing
0	1.31	0.0000	1.3100	0.0000	1.3100	1.0000	Missing	Missing
0	1.76	0.0000	1.7600	0.0000	1.7600	1.0000	Missing	Missing
0.01	2.6	0.0100	2.6000	2.3711	0.2289	1.0000	0.1122	0.5128
0.01	2.15	0.0100	2.1500	2.3711	-0.2211	1.0000	0.1122	-0.4951

0.01	2.42	0.0100	2.4200	2.3711	0.0489	1.0000	0.1122	0.1096
0.01	1.99	0.0100	1.9900	2.3711	-0.3811	1.0000	0.1122	-0.8534
0.01	2.6	0.0100	2.6000	2.3711	0.2289	1.0000	0.1122	0.5128
0.01	2.15	0.0100	2.1500	2.3711	-0.2211	1.0000	0.1122	-0.4951
0.01	2.52	0.0100	2.5200	2.3711	0.1489	1.0000	0.1122	0.3336
0.02	3.11	0.0200	3.1100	3.0607	0.0493	1.0000	0.1019	0.1098
0.02	2.91	0.0200	2.9100	3.0607	-0.1507	1.0000	0.1019	-0.3357
0.02	3.11	0.0200	3.1100	3.0607	0.0493	1.0000	0.1019	0.1098
0.02	3.02	0.0200	3.0200	3.0607	-0.0407	1.0000	0.1019	-0.0907
0.03	3.67	0.0300	3.6700	3.5119	0.1581	1.0000	0.0940	0.3509
0.03	3.45	0.0300	3.4500	3.5119	-0.0619	1.0000	0.0940	-0.1373
0.03	3.67	0.0300	3.6700	3.5119	0.1581	1.0000	0.0940	0.3509
0.03	3.57	0.0300	3.5700	3.5119	0.0581	1.0000	0.0940	0.1290
0.05	4.03	0.0500	4.0300	4.1193	-0.0893	1.0000	0.0851	-0.1975
0.05	4.16	0.0500	4.1600	4.1193	0.0407	1.0000	0.0851	0.0899
0.06	4.27	0.0600	4.2700	4.3439	-0.0739	1.0000	0.0828	-0.1631
0.06	4.27	0.0600	4.2700	4.3439	-0.0739	1.0000	0.0828	-0.1631
0.08	4.64	0.0800	4.6400	4.7033	-0.0633	1.0000	0.0808	-0.1396
0.08	4.78	0.0800	4.7800	4.7033	0.0767	1.0000	0.0808	0.1693
0.09	4.89	0.0900	4.8900	4.8515	0.0385	1.0000	0.0805	0.0849
0.09	4.88	0.0900	4.8800	4.8515	0.0285	1.0000	0.0805	0.0628
0.12	5.27	0.1200	5.2700	5.2141	0.0559	1.0000	0.0810	0.1234
0.14	5.4	0.1400	5.4000	5.4076	-0.0076	1.0000	0.0819	-0.0168
0.15	5.51	0.1500	5.5100	5.4938	0.0162	1.0000	0.0824	0.0357
0.15	5.51	0.1500	5.5100	5.4938	0.0162	1.0000	0.0824	0.0357
0.2	5.88	0.2000	5.8800	5.8496	0.0304	1.0000	0.0849	0.0672
0.23	6.02	0.2300	6.0200	6.0195	0.0005	1.0000	0.0861	0.0011
0.25	6.12	0.2500	6.1200	6.1197	0.0003	1.0000	0.0868	0.0007
0.25	6.12	0.2500	6.1200	6.1197	0.0003	1.0000	0.0868	0.0007
0.34	6.47	0.3400	6.4700	6.4804	-0.0104	1.0000	0.0890	-0.0230
0.38	6.6	0.3800	6.6000	6.6070	-0.0070	1.0000	0.0896	-0.0155
0.41	6.7	0.4100	6.7000	6.6922	0.0078	1.0000	0.0899	0.0173
0.41	6.69	0.4100	6.6900	6.6922	-0.0022	1.0000	0.0899	-0.0049
0.56	7.02	0.5600	7.0200	7.0297	-0.0097	1.0000	0.0902	-0.0216
0.62	7.13	0.6200	7.1300	7.1355	-0.0055	1.0000	0.0900	-0.0121
0.67	7.22	0.6700	7.2200	7.2145	0.0055	1.0000	0.0897	0.0122
0.68	7.22	0.6800	7.2200	7.2294	-0.0094	1.0000	0.0897	-0.0209
0.92	7.52	0.9200	7.5200	7.5231	-0.0031	1.0000	0.0879	-0.0068
1.02	7.62	1.0200	7.6200	7.6183	0.0017	1.0000	0.0870	0.0037
1.11	7.69	1.1100	7.6900	7.6945	-0.0045	1.0000	0.0863	-0.0099
1.12	7.7	1.1200	7.7000	7.7024	-0.0024	1.0000	0.0862	-0.0054
1.51	7.95	1.5100	7.9500	7.9568	-0.0068	1.0000	0.0833	-0.0150
1.68	8.04	1.6800	8.0400	8.0423	-0.0023	1.0000	0.0822	-0.0051
1.83	8.11	1.8300	8.1100	8.1089	0.0011	1.0000	0.0814	0.0025
1.84	8.11	1.8400	8.1100	8.1131	-0.0031	1.0000	0.0813	-0.0068
2.49	8.33	2.4900	8.3300	8.3340	-0.0040	1.0000	0.0788	-0.0087
2.78	8.41	2.7800	8.4100	8.4090	0.0010	1.0000	0.0782	0.0022
3.02	8.46	3.0200	8.4600	8.4636	-0.0036	1.0000	0.0778	-0.0079
3.03	8.46	3.0300	8.4600	8.4657	-0.0057	1.0000	0.0778	-0.0126
4.1	8.65	4.1000	8.6500	8.6516	-0.0016	1.0000	0.0775	-0.0035
4.58	8.71	4.5800	8.7100	8.7147	-0.0047	1.0000	0.0779	-0.0103
4.98	8.76	4.9800	8.7600	8.7606	-0.0006	1.0000	0.0783	-0.0014
6.77	8.92	6.7700	8.9200	8.9171	0.0029	1.0000	0.0813	0.0065
7.55	8.97	7.5500	8.9700	8.9682	0.0018	1.0000	0.0828	0.0040
8.21	9.01	8.2100	9.0100	9.0060	0.0040	1.0000	0.0840	0.0088
11.16	9.14	11.1600	9.1400	9.1339	0.0061	1.0000	0.0897	0.0134
12.45	9.18	12.4500	9.1800	9.1757	0.0043	1.0000	0.0921	0.0096
13.53	9.21	13.5300	9.2100	9.2062	0.0038	1.0000	0.0939	0.0085
18.39	9.31	18.3900	9.3100	9.3097	0.0003	1.0000	0.1013	0.0007
20.52	9.35	20.5200	9.3500	9.3434	0.0066	1.0000	0.1040	0.0147
22.31	9.37	22.3100	9.3700	9.3681	0.0019	1.0000	0.1061	0.0043
30.33	9.46	30.3300	9.4600	9.4512	0.0088	1.0000	0.1140	0.0198
33.83	9.48	33.8300	9.4800	9.4781	0.0019	1.0000	0.1168	0.0043

36.79	9.5	36.7900	9.5000	9.4978	0.0022	1.0000	0.1190	0.0049
55.78	9.59	55.7800	9.5900	9.5854	0.0046	1.0000	0.1294	0.0105
60.65	9.61	60.6500	9.6100	9.6010	0.0090	1.0000	0.1314	0.0203
91.97	9.68	91.9700	9.6800	9.6704	0.0096	1.0000	0.1410	0.0219
151.63	9.75	151.6300	9.7500	9.7375	0.0125	1.0000	0.1515	0.0288

## Diagnostics

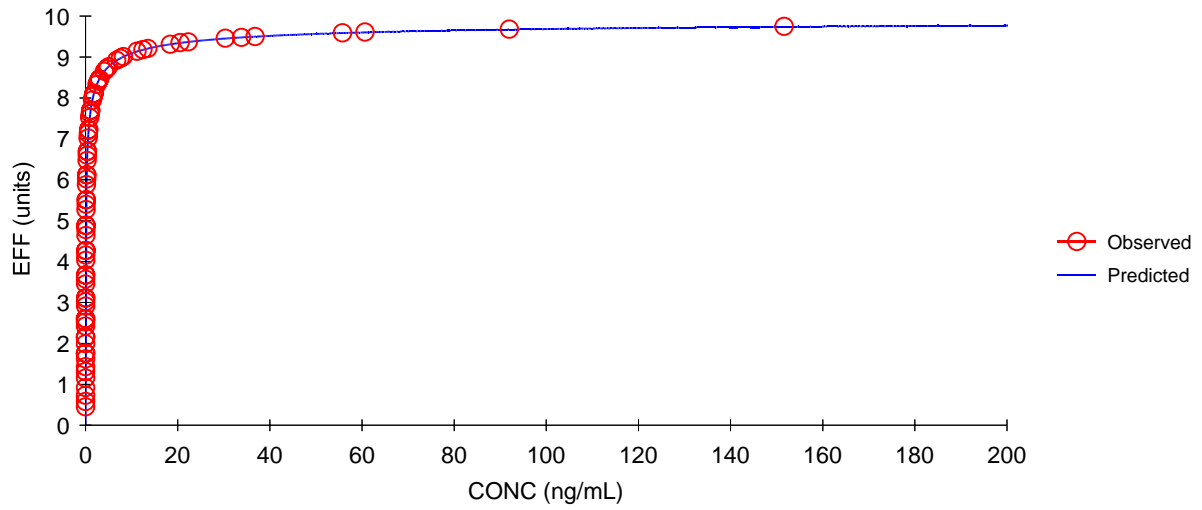
Function	Item	Value
1	CSS	664.352
1	WCSS	664.352
1	SSR	16.3187
1	WSSR	16.3187
1	S	0.46036
1	DF	77
1	CORR_(OBS,PRED)	0.9932
1	AIC	229.38491
1	SBC	236.53099

## Partial Derivatives

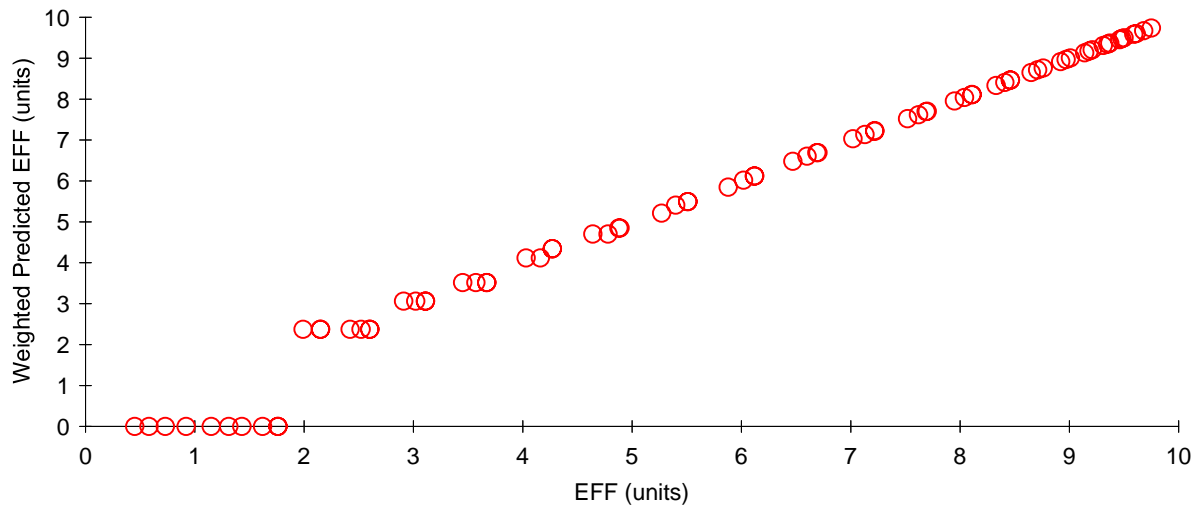
Function	Time (ng/mL)	Emax	EC50	Gamma
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	0	0.00000000	0.00000000	0.00000000
1	1.00E-02	0.23762227	-9.09629687	-4.16782668
1	1.00E-02	0.23762227	-9.09629687	-4.16782668
1	1.00E-02	0.23762227	-9.09629687	-4.16782668
1	1.00E-02	0.23762227	-9.09629687	-4.16782668
1	1.00E-02	0.23762227	-9.09629687	-4.16782668
1	1.00E-02	0.23762227	-9.09629687	-4.16782668
1	1.00E-02	0.23762227	-9.09629687	-4.16782668
1	2.00E-02	0.30673906	-10.67795927	-3.42254342
1	2.00E-02	0.30673906	-10.67795927	-3.42254342
1	2.00E-02	0.30673906	-10.67795927	-3.42254342
1	2.00E-02	0.30673906	-10.67795927	-3.42254342
1	3.00E-02	0.35195269	-11.45310813	-2.74846360
1	3.00E-02	0.35195269	-11.45310813	-2.74846360
1	3.00E-02	0.35195269	-11.45310813	-2.74846360
1	3.00E-02	0.35195269	-11.45310813	-2.74846360
1	5.00E-02	0.41283194	-12.17254625	-1.68567839
1	5.00E-02	0.41283194	-12.17254625	-1.68567839
1	6.00E-02	0.43533515	-12.34426239	-1.26226525
1	6.00E-02	0.43533515	-12.34426239	-1.26226525
1	8.00E-02	0.47135454	-12.51326838	-0.56425903
1	8.00E-02	0.47135454	-12.51326838	-0.56425903
1	9.00E-02	0.48620997	-12.54501978	-0.27209499
1	9.00E-02	0.48620997	-12.54501978	-0.27209499
1	0.12	0.52254336	-12.52927843	0.44443131
1	0.14	0.54193872	-12.46659376	0.82403108
1	0.15	0.55058197	-12.42648837	0.99171758

1	0.15	0.55058197	-12.42648837	0.99171758
1	0.2	0.58623707	-12.18172019	1.66841771
1	0.23	0.60326157	-12.01980526	1.97996539
1	0.25	0.61330328	-11.91065042	2.15926633
1	0.25	0.61330328	-11.91065042	2.15926633
1	0.34	0.64945325	-11.43382321	2.77114547
1	0.38	0.66214231	-11.23532320	2.97122671
1	0.41	0.67068012	-11.09265933	3.10089309
1	0.41	0.67068012	-11.09265933	3.10089309
1	0.56	0.70450667	-10.45544459	3.57007442
1	0.62	0.71510273	-10.23219401	3.70062504
1	0.67	0.72302155	-10.05798549	3.79249505
1	0.68	0.72451865	-10.02434206	3.80929357
1	0.92	0.75394702	-9.31729868	4.09970758
1	1.02	0.76349363	-9.06924048	4.17630062
1	1.11	0.77112405	-8.86438758	4.23073118
1	1.12	0.77192314	-8.84259610	4.23607015
1	1.51	0.79741585	-8.11372765	4.36797362
1	1.68	0.80598731	-7.85398978	4.39439591
1	1.83	0.81265754	-7.64675597	4.40819383
1	1.84	0.81307654	-7.63358911	4.40885663
1	2.49	0.83521301	-6.91287288	4.40744937
1	2.78	0.84273464	-6.65677631	4.38962822
1	3.02	0.84820247	-6.46703915	4.37071920
1	3.03	0.84841748	-6.45951668	4.36987016
1	4.1	0.86704762	-5.79007857	4.26423699
1	4.58	0.87336694	-5.55508385	4.21311246
1	4.98	0.87797411	-5.38122887	4.17058907
1	6.77	0.89365135	-4.77365829	3.99029383
1	7.55	0.89877712	-4.56965097	3.91853384
1	8.21	0.90256627	-4.41714446	3.86112690
1	11.16	0.91538507	-3.89051266	3.63747025
1	12.45	0.91957026	-3.71499719	3.55389118
1	13.53	0.92262579	-3.58574503	3.48934754
1	18.39	0.93299867	-3.13996119	3.24646081
1	20.52	0.93637950	-2.99233067	3.15878472
1	22.31	0.93885186	-2.88364264	3.09182239
1	30.33	0.94717919	-2.51304462	2.84732365
1	33.83	0.94987371	-2.39163545	2.76149029
1	36.79	0.95185427	-2.30193049	2.69614794
1	55.78	0.96062837	-1.89978607	2.38168618
1	60.65	0.96219772	-1.82704239	2.32076657
1	91.97	0.96915024	-1.50179518	2.03139632
1	151.63	0.97587311	-1.18267096	1.71675629

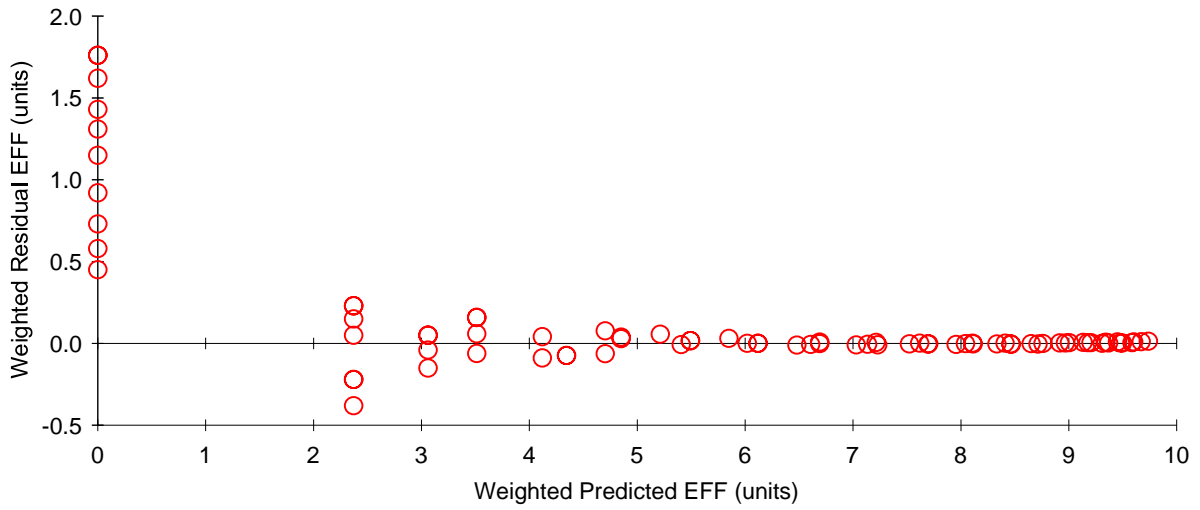
### X vs. Observed Y and Predicted Y



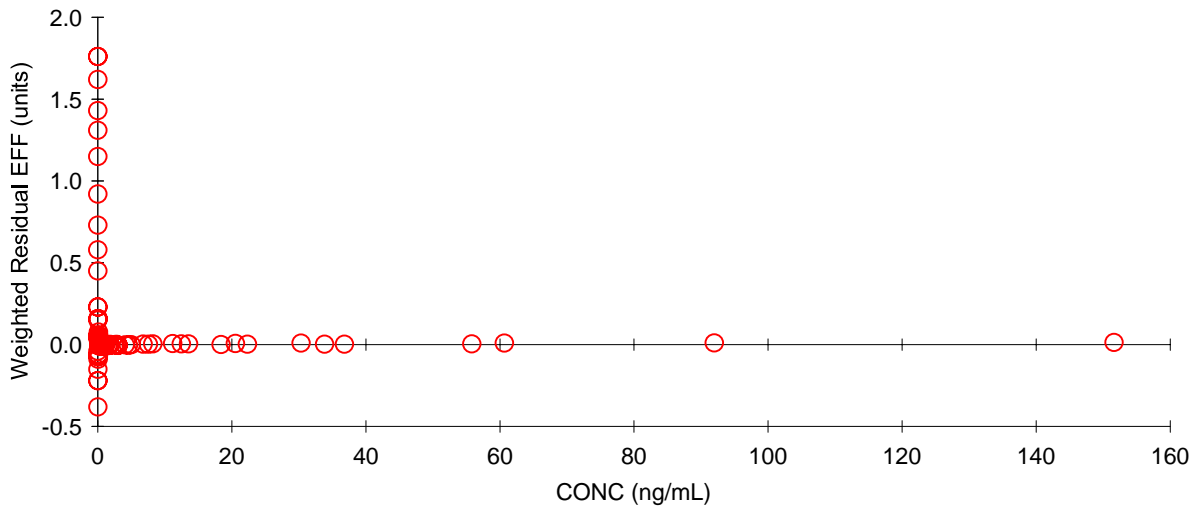
### Observed Y vs. Weighted Predicted Y



### Weighted Predicted Y vs. Weighted Residual Y



### X vs. Weighted Residual Y



# Partial Derivatives

