

Supplemental Table 1. Analytical Methods

Parameter	Column 1	Column 2
Column	Agilent HP-Wax	Agilent DB-ALC1
Headspace		
Oven Temperature	70°C	70°C
Loop Temperature	80°C	80°C
Transfer Line Temperature	90°C	90°C
Pressurization Time	0.20 min	0.20 min
Loop Fill Time	0.20 min	0.20 min
Loop Volume	1.0 mL	1.0 mL
GC Inlet Parameters		
Inlet Mode:	Split	Split
Inlet Temperature	250°C	250°C
Total (Helium) Flow Rate	4.1 ml/min (constant flow)	11.5 ml/min (constant flow)
GC Column Parameters		
Dimensions (LxDxT)	30.0m x 250µm x 0.25µm	30.0m x 320µm x 1.8µm
Oven Program	40°C (isothermic)	40°C (isothermic)
Avg Column Velocity	25 cm/sec	69 cm/sec
Run Time	10.0 min	3.0 min
Flame Ionization Detector		
Temperature	300°C	300°C
Hydrogen Flow	30.0 mL/min	40.0 mL/min
Air Flow	400.0 mL/min	450.0 mL/min

Supplemental Table 2. Blood Ethanol Concentrations (GD9-20, mg/dL)

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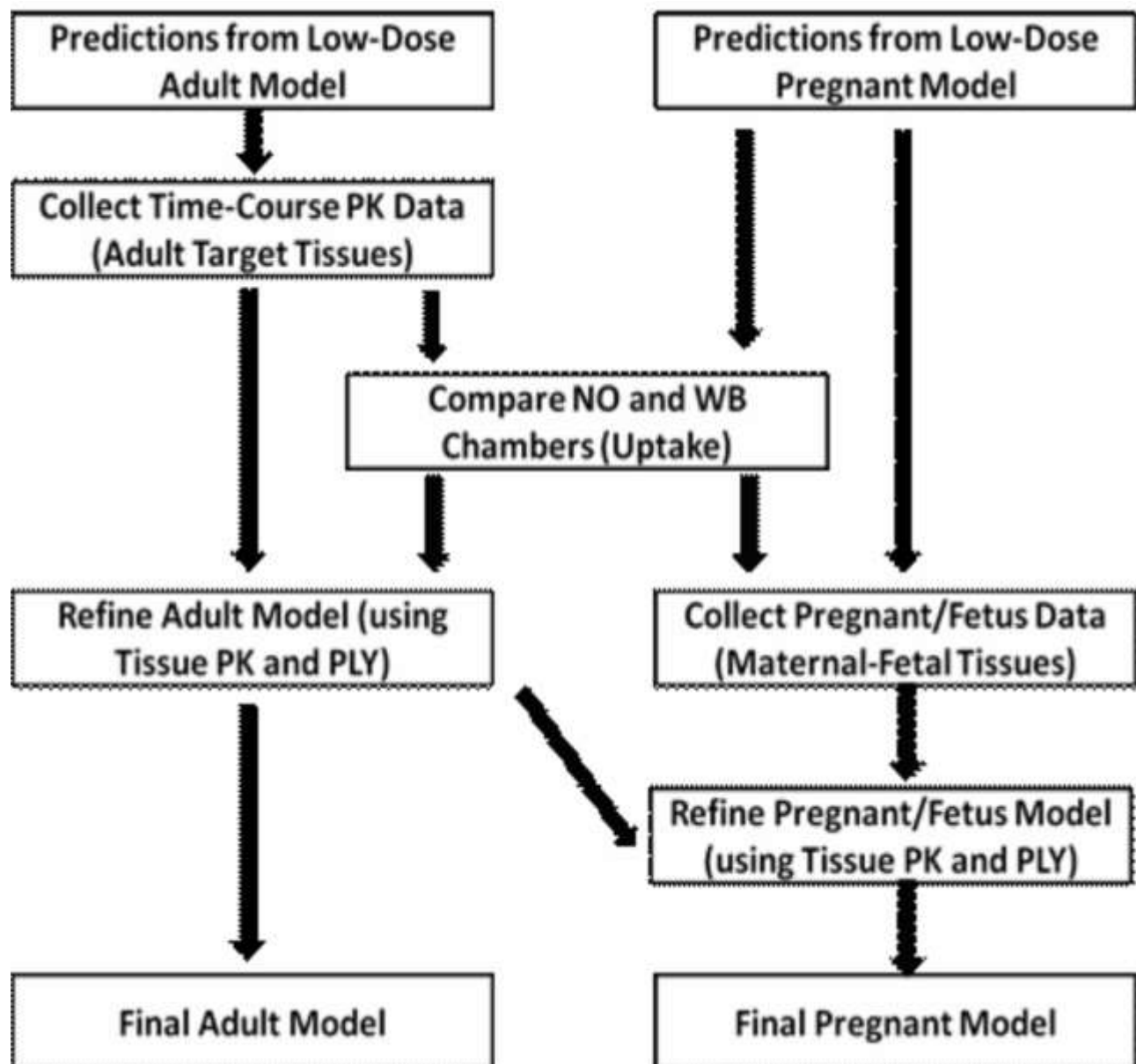
	GD9	GD12	GD16	GD20
Dam 1	148	191	138	191
Dam 2	198	204	126	179
Dam 3	103	138	127	167
Dam 4	162	9	201	187

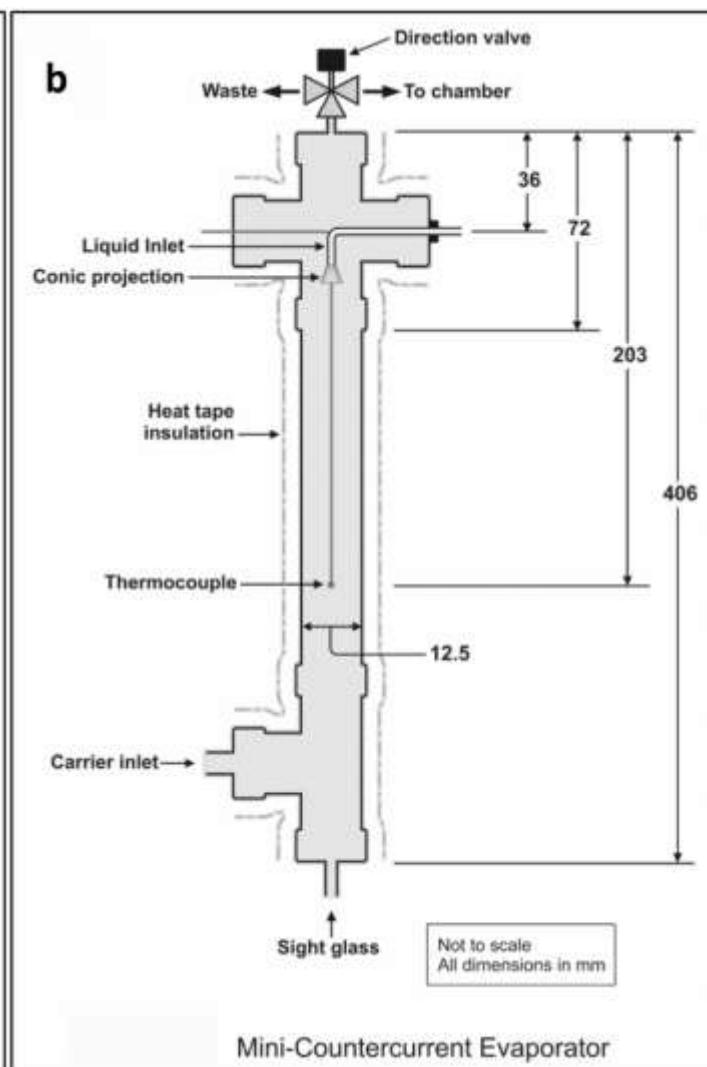
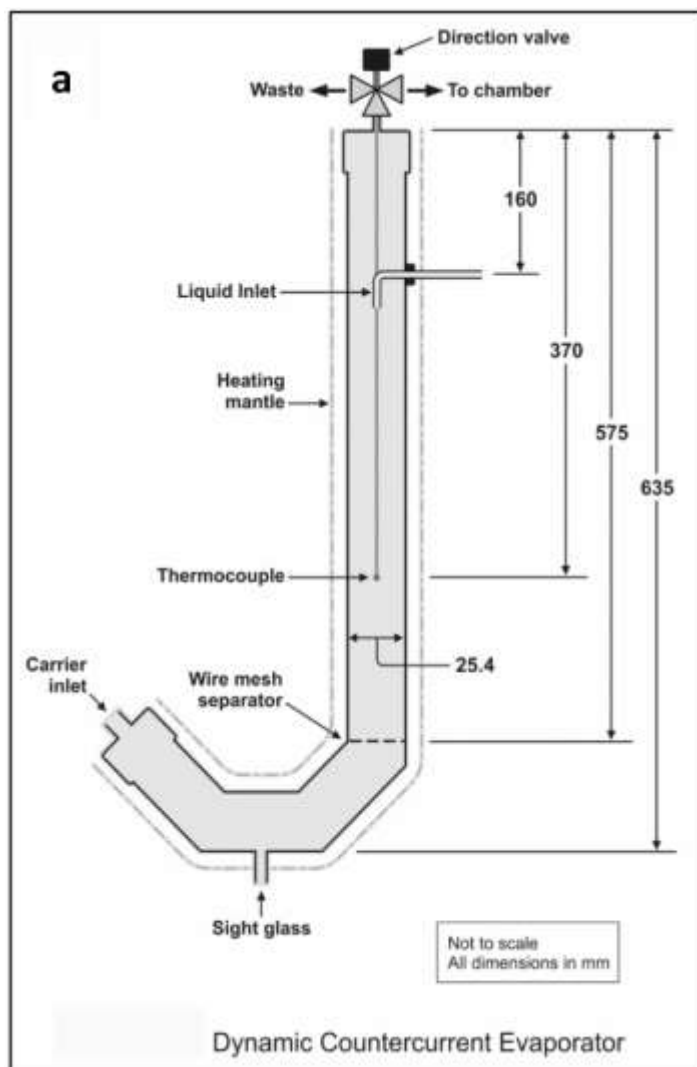
Supplemental Table 3a. Nose-Only Plethysmography Results.

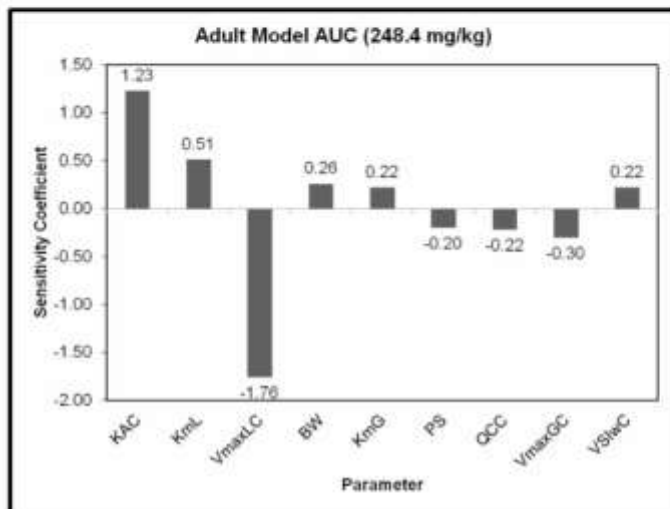
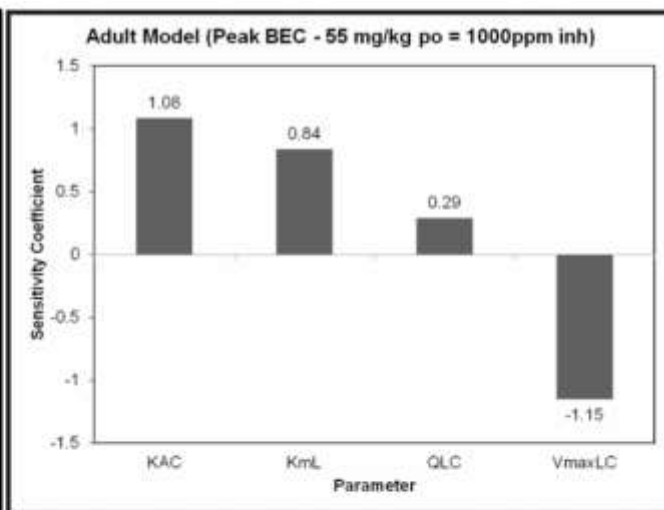
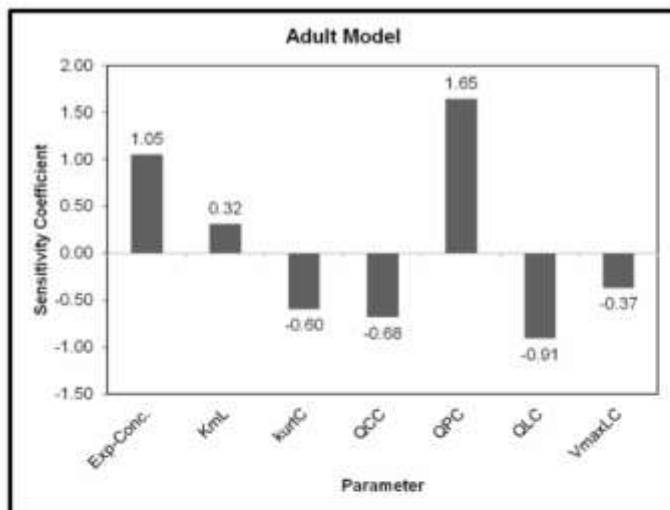
Nose-Only	F (b/min)	Vt (mL/b)	Ve (mL/min)	TI (s)	TE (s)	PIF (mL/s)	PEF (mL/s)	RT (s)	PenH	Paus	TETI
0ppm Avg (SD, AUC)	164 (39.7, 912.1)	2.78 (0.82, 16.06)	450 (175.9, 150911)	0.21 (0.06, 1.29)	0.20 (0.06, 1.27)	23.6 (7.28, 131.57)	20.31 (8.62, 107.36)	0.14 (0.04, 0.91)	0.59 (0.15, 3.44)	0.68 (0.13, 4.10)	77.80 (12.4, 441.44)
5,000ppm Avg (SD, AUC, % change)	170* (26.4, 996.3, 3.66)	2.41* (0.1, 14.33, -13.31)	406.0 (80.2, 140467 , - 9.78)	0.17* (0.02, 1.01, -19.05)	0.21 (0.06, 1.28, 5.0)	19.8* (3.69, 118.5, -16.10)	18.67 * (3.76, 106.5, -8.08)	0.13 (0.04, 0.81, - 7.14)	0.62 (0.14, 3.41, 5.09)	0.64 (0.13, 3.75, - 5.88)	86.2* (15.34, 487.08, 10.80)
10,000 ppm Avg (SD, AUC, % change)	166 (23.1, 984.8, 1.22)	2.50* (0.32, 14.58, -10.07)	415.0 (81.6, 140204 , - 7.78)	0.17* (0.02, 1.01, -19.05)	0.20 (0.03, 1.21, 0.0)	19.2* (4.25, 113.4, -18.64)	20.06 (4.05, 113.90, -1.23)	0.13 (0.02, 0.79, - 7.14)	0.63 (0.21, 3.51, 6.78)	0.56 (0.09, 3.38, - 17.65)	95.93* (24.94, 539.58, 23.30)
21,000 ppm Avg (SD, AUC, % change)	157* (31.9, 891.7, - 4.27)	2.3* (0.5, 13.77, - 17.266)	351.0* (80.3, 118701 , - 22.0)	0.20 (0.05, 1.23, -4.76)	0.21* (0.05, 1.34, 5.0)	16.6* (3.95, 95.16, -29.66)	17.86* (4.67, 99.30, -12.06)	0.13 (0.04, 0.85, - 7.14)	0.67 (0.22, 3.94), 13.56	0.60 (0.13, 3.69, - 11.76)	100.56 * (28.6, 568.48, 29.25)

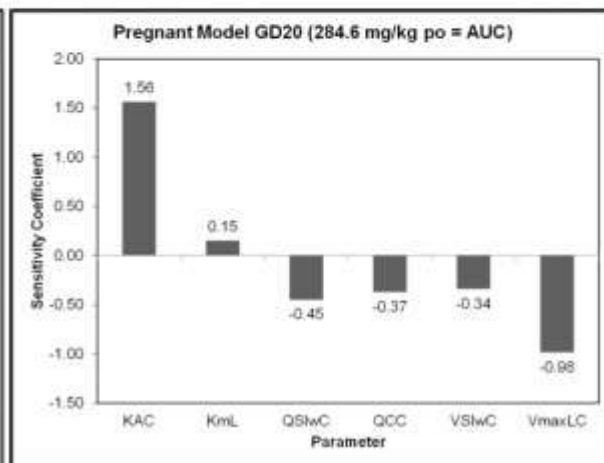
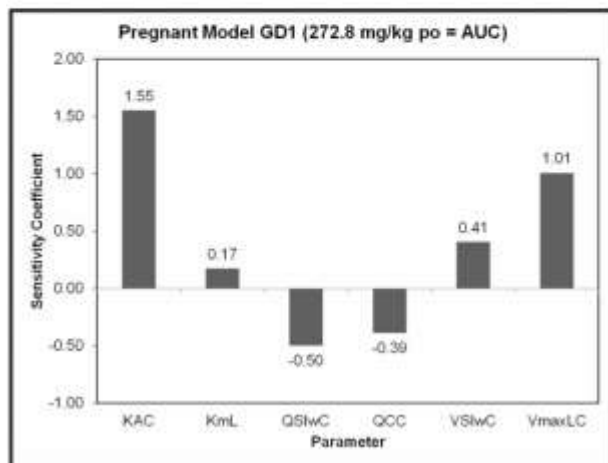
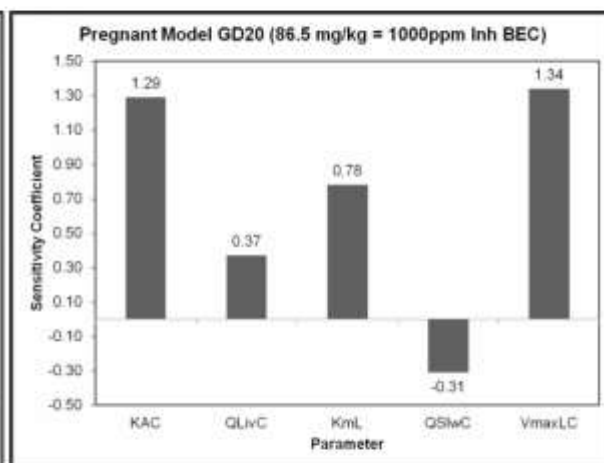
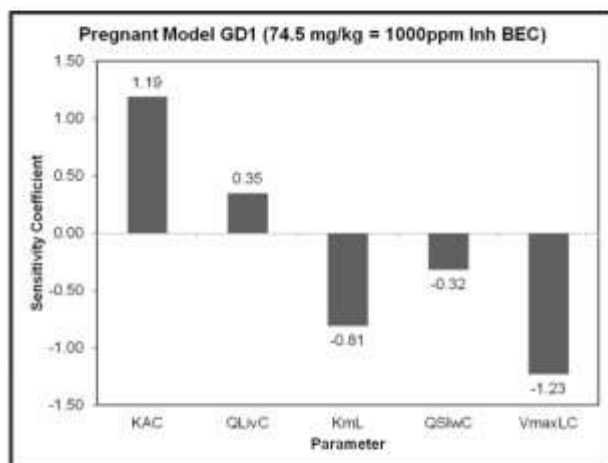
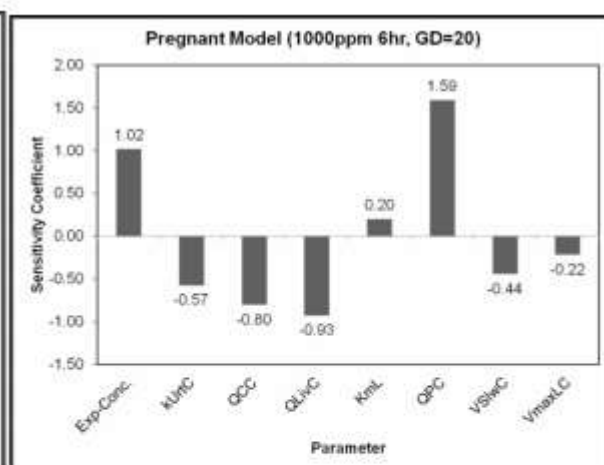
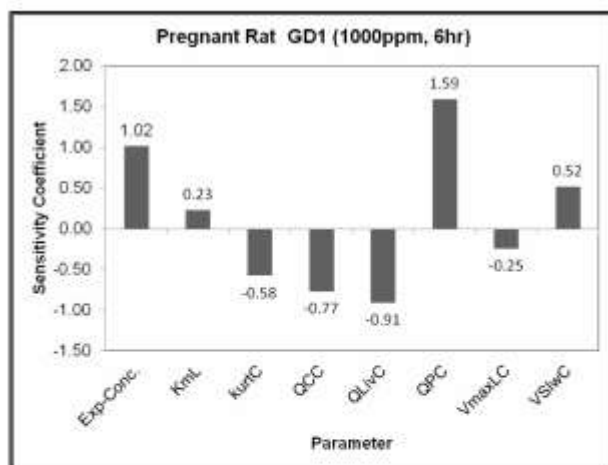
Supplemental Table 3b. Whole-Body Plethysmography Results

Whole-Body	F (b/min)	Vt (mL/b)	Ve (mL/min)	TI (s)	TE (s)	PIF (mL/s)	PEF (mL/s)	RT (s)	Pen H	Pau s	TETI
0ppm Avg (SD, AUC)	213 (101.8, 1070.0)	1.32 (0.16, 7.98)	247 (104.1, 84526.8)	0.17 0 (0.06, 1.13)	0.21 (0.06, 1.37)	16.0 (6.6, 81.10)	13.5 (5.1, 70.74)	0.12 (0.03, 0.79)	0.77 (0.14, 4.83)	0.80 (0.07, 4.89)	81.3 (9.9, 499.75)
5,000ppm Avg (SD, AUC, % change)	179* (66.3, 989.59, -15.96)	1.47* (0.32, 9.91, 11.36)	255 (50.0, 87630.5, 3.24)	0.179* (0.05, 1.17, 5.29)	0.216 (0.04, 1.34, 2.86)	15.7* (2.9, 89.23, -1.88)	14.0 (2.9, 83.15, 3.70)	0.13 (0.02, 0.79, 3.28)	0.78 (0.09, 4.81, 1.30)	0.79 (0.07, 4.68, -1.25)	84.6* (12.1, 534.64, 4.06)
10,000ppm Avg (SD, AUC, % change)	203 (76.4, 1072.3, 1, -4.69)	1.35 (0.24, 8.88, 2.27)	257* (47.0, 88239.6, 4.05)	0.163 (0.04, 1.06, -4.12)	0.197* (0.04, 1.20, -6.19)	15.6* (3.5, 88.30, -2.5)	13.9 (2.7, 81.65, 2.96)	0.11* (0.02, 0.70, -6.56)	0.75* (0.1, 4.65, -2.60)	0.77* (0.05, 4.60, -3.75)	85.1* (11.9, 536.83, 4.67)
21,000ppm Avg (SD, AUC, % change)	185* (59.3, 1000.6, 5, -13.14)	1.22* (0.12, 7.20, -7.58)	201* (76.9, 68615.0, -18.62)	0.176 (0.04, 1.13, 3.53)	0.23 (0.04, 1.14, 9.52)	13.2* (4.6, 70.37, -17.5)	11.6* (3.6, 63.83, -14.07)	0.13 (0.03, 0.81, 9.02)	0.80* (0.14, 5.07, 3.90)	0.81 (0.08, 5.00, 1.25)	79.1 (9.6, 490.95, -2.71)









Supplemental Figure Captions

Supplemental Figure 1. Flow diagram of studies performed to refine and evaluate adult and pregnant PBPK models.

Supplemental Figure 2. Evaporators. a.) Dynamic countercurrent evaporator used for Experiments 1 and 2. Measurements (mm), attachment points, and direction of flows are clearly indicated. b.) Mini-countercurrent evaporator used for Experiment 3.

Supplemental Figure 3a. Results of Sensitivity Analyses. a.) The PBPK model for non-pregnant rats was analyzed at 1,000 ppm (6hr), at the same achieved peak BEC as would be achieved by oral gavage (55 mg/kg), and at the same estimated AUC in blood as would be achieved by the aforementioned inhalation scenario; to evaluate route dependencies.

Supplemental Figure 3b.) Results of Sensitivity Analyses. The model for pregnant rats was analyzed at 1,000 ppm (6hr) on GD1 and GD20, at the same peak BEC produced by gavage on GD1 (74.5 mg/kg) and GD20 (86.5 mg/kg), as well as at the same AUCs from the inhalation scenario on GD1 (272.8 mg/kg) and GD20 (284.6 mg/kg); evaluating both route dependencies and the effect of gestational stage.