

ADME NTP Study S0815 Propargyl alcohol

The contract laboratory abbreviation for the test article is PAL.

Sex/Species: adult male F344 rats and B6C3F1 mice.

Vehicles: intravenous, 0.9% aqueous sodium chloride and ethanol (200 proof) 9:1 (v:v); oral, water; dermal, ethanol; inhalation, conditioned room air.

CASRN 107-19-7

Radiolabeled with carbon-14 on carbons 2 and 3; Propargyl alcohol, [2,3-¹⁴C]-

Studies Performed:

1. Single 1 mg PAL/kg intravenous dose in male rats with sacrifice at 0.25, 0.5, 1, 2, 4, 8, 24 hours postdose. (Study A)
2. Single 1 mg PAL/kg intravenous dose in male mice with sacrifice at 0.25, 0.5, 1, 2, 4, 8, 24 hours postdose. (Study E)
3. Single 1 mg PAL/kg intravenous dose in male rats with sacrifice at 72 hours postdose. (Study B)
4. Single 1 mg PAL/kg intravenous dose in male mice with sacrifice 72 hours postdose. (Study D)
5. Single 1 mg PAL/kg intravenous dose biliary excretion study in male rats with sacrifice 4 hours postdose. (Study F)
6. Single 50 mg PAL/kg oral gavage dose in male rats with sacrifice 72 hours postdose. (Study H)
7. Single 50 mg PAL/kg oral gavage dose in male mice with sacrifice 72 hours postdose. (Study G)
8. Single 5 mg PAL/kg 6-hour dermal exposure in male rats with sacrifice 24 hours postdose. (Study C)
9. Single 1 ppm 6-hour nose-only inhalation exposure in male rats and mice with sacrifice 24 hours postdose. (Study J)
10. Single 100 ppm 6-hour nose-only inhalation exposure in male rats and mice with sacrifice 24 hours postdose. (Study K)
11. 10 ppm nose-only inhalation exposure in male rats and mice with sacrifice 24 hours postdose. (Study L)

Six hours after application of the dermal dose, the rats were removed from their chambers, anesthetized, and the protective dermal appliance removed. The dose site was gently scrubbed with soapy water and the rats returned to their metabolism chambers for the rest of the study.

Tissues from the 10 ppm nose-only inhalation exposure study animals were not harvested. Values are expressed as mean \pm standard deviation (S.D.). Hour is abbreviated as h.

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Table 1

**Tissue Distribution of Radioactivity 0.25 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male F-344 Rats^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	142 ± 15	0.126 ± 0.016	0.981 ± 0.117
Bladder	1020 ± 114	0.902 ± 0.088	0.0253 ± 0.0047
Blood	1130 ± 75	unity	5.80 ± 0.21
Brain	509 ± 46	0.450 ± 0.025	0.322 ± 0.011
Heart	911 ± 85	0.805 ± 0.041	0.262 ± 0.020
Kidney	2430 ± 152	2.16 ± 0.13	1.69 ± 0.05
Liver	2390 ± 146	2.12 ± 0.17	9.07 ± 0.88
Lung	859 ± 135	0.758 ± 0.086	0.291 ± 0.036
Muscle	796 ± 46	0.704 ± 0.030	37.6 ± 1.2
Skin	691 ± 57	0.611 ± 0.018	11.6 ± 0.5
Spleen	758 ± 44	0.671 ± 0.014	0.160 ± 0.008
Testes	756 ± 58	0.669 ± 0.035	0.757 ± 0.017
Stomach ^c	NA ^d	NA	1.82 ± 1.51
Small intestine ^c	NA	NA	13.1 ± 1.9
Cecum ^c	NA	NA	1.24 ± 0.12
Large intestine ^c	NA	NA	0.780 ± 0.114

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 1.02 ± 0.03 mg PAL/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 2

**Tissue Distribution of Radioactivity 0.5 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male F-344 Rats^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	126 ± 54	0.154 ± 0.053	0.844 ± 0.341
Bladder	1080 ± 358	1.32 ± 0.34	0.0222 ± 0.0042
Blood	805 ± 71	unity	4.02 ± 0.32
Brain	304 ± 77	0.374 ± 0.065	0.196 ± 0.058
Heart	678 ± 64	0.842 ± 0.011	0.233 ± 0.084
Kidney	3750 ± 676	4.63 ± 0.51	2.55 ± 0.44
Liver	2130 ± 304	2.66 ± 0.37	7.65 ± 1.31
Lung	617 ± 89	0.764 ± 0.047	0.240 ± 0.106
Muscle	462 ± 113	0.569 ± 0.089	21.2 ± 4.7
Skin	538 ± 96	0.666 ± 0.086	8.80 ± 1.71
Spleen	584 ± 93	0.722 ± 0.052	0.131 ± 0.038
Testes	457 ± 69	0.567 ± 0.049	0.474 ± 0.077
Stomach ^c	NA ^d	NA	1.34 ± 0.80
Small intestine ^c	NA	NA	19.9 ± 5.8
Cecum ^c	NA	NA	1.27 ± 0.27
Large intestine ^c	NA	NA	0.657 ± 0.215

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 1.04 ± 0.04 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 3

Tissue Distribution of Radioactivity 1 h following a Single 1 mg/kg Intravenous Dose of [¹⁴C]PAL to Male F-344 Rats^a

Tissue	ng-eq PAL per g Tissue		Tissue/Blood Ratio		% Dose in Total Tissue ^b
Adipose	139	± 87	0.387	± 0.341	1.04 ± 0.67
Bladder	7660	± 5960	20.9	± 20.0	0.174 ± 0.135
Blood	418	± 95	unity		2.28 ± 0.44
Brain	207	± 25	0.506	± 0.077	0.141 ± 0.009
Heart	482	± 72	1.17	± 0.11	0.159 ± 0.028
Kidney	3890	± 105	9.70	± 2.40	2.91 ± 0.20
Liver	1310	± 264	3.15	± 0.18	5.30 ± 0.61
Lung	354	± 38	0.875	± 0.183	0.130 ± 0.012
Muscle ^c	240	± 108	0.641	± 0.462	12.2 ± 5.8
Skin	358	± 68	0.864	± 0.044	6.41 ± 1.03
Spleen	500	± 47	1.26	± 0.43	0.127 ± 0.005
Testes	300	± 41	0.730	± 0.082	0.345 ± 0.037
Stomach ^d	NA ^e		NA		0.753 ± 0.436
Small intestine ^d	NA		NA		29.9 ± 1.2
Cecum ^d	NA		NA		1.61 ± 0.32
Large intestine ^d	NA		NA		0.748 ± 0.068

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.95 ± 0.04 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Results are averages of the hind leg muscle data only. The abdominal muscle samples from one of the four rats appeared to have been contaminated with urine (126% of delivered dose). It was therefore decided not to include the abdominal muscle results from any of the rats in this group.

^d Includes contents.

^e NA = Not applicable.

Table 4

**Tissue Distribution of Radioactivity 2 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male F-344 Rats^a**

Tissue	ng-eq PAL per g Tissue		Tissue/Blood Ratio		% Dose in Total Tissue ^b	
Adipose	87.1	± 36.9	0.387	± 0.151	0.613	± 0.249
Bladder	4770	± 2580	21.4	± 12.0	0.110	± 0.058
Blood	223	± 19	unity		1.19	± 0.06
Brain	183	± 8	0.826	± 0.092	0.112	± 0.002
Heart	287	± 27	1.29	± 0.09	0.0870	± 0.0047
Kidney	2730	± 283	12.3	± 1.2	1.94	± 0.24
Liver	798	± 76	3.59	± 0.31	3.23	± 0.40
Lung	222	± 34	0.993	± 0.110	0.0795	± 0.0134
Muscle	143	± 78	0.659	± 0.409	7.00	± 4.01
Skin	233	± 110	1.03	± 0.40	3.97	± 1.74
Spleen	367	± 16	1.65	± 0.13	0.0908	± 0.0073
Testes	182	± 22	0.822	± 0.119	0.191	± 0.032
Stomach ^c	NA ^d		NA		0.357	± 0.103
Small intestine ^c	NA		NA		25.5	± 3.3
Cecum ^c	NA		NA		3.91	± 2.27
Large intestine ^c	NA		NA		0.453	± 0.169

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.99 ± 0.03 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 5

**Tissue Distribution of Radioactivity 4 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male F-344 Rats^a**

Tissue	ng-eq PAL per g Tissue		Tissue/Blood Ratio		% Dose in Total Tissue ^b
Adipose	61.4	± 16.4	0.373	± 0.113	0.445 ± 0.128
Bladder	962	± 566	5.78	± 3.27	0.0215 ± 0.0089
Blood	165	± 11	unity		0.887 ± 0.052
Brain	149	± 12	0.903	± 0.097	0.110 ± 0.006
Heart	177	± 19	1.07	± 0.10	0.0551 ± 0.0036
Kidney	1290	± 111	7.80	± 0.67	0.947 ± 0.067
Liver	669	± 66	4.04	± 0.31	2.55 ± 0.36
Lung	171	± 18	1.03	± 0.13	0.0639 ± 0.0046
Muscle	78.3	± 14.1	0.473	± 0.070	3.87 ± 0.66
Skin	147	± 27	0.886	± 0.109	2.58 ± 0.45
Spleen	253	± 17	1.53	± 0.11	0.0585 ± 0.0026
Testes	100	± 9	0.607	± 0.051	0.116 ± 0.006
Stomach ^c	NA ^d		NA		0.159 ± 0.043
Small intestine ^c	NA		NA		4.29 ± 0.81
Cecum ^c	NA		NA		11.9 ± 2.4
Large intestine ^c	NA		NA		1.90 ± 0.77

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.97 ± 0.02 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 6

**Tissue Distribution of Radioactivity 8 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male F-344 Rats^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	98.0 ± 55.0	0.804 ± 0.432	0.705 ± 0.394
Bladder	210 ± 41	1.72 ± 0.33	0.00501 ± 0.00128
Blood	122 ± 5	unity	0.651 ± 0.028
Brain	74.8 ± 6.3	0.616 ± 0.052	0.0526 ± 0.0030
Heart	82.3 ± 9.4	0.677 ± 0.077	0.0248 ± 0.0024
Kidney	541 ± 60	4.47 ± 0.70	0.377 ± 0.023
Liver	577 ± 80	4.75 ± 0.73	2.22 ± 0.35
Lung	150 ± 8	1.24 ± 0.10	0.0540 ± 0.0043
Muscle	44.3 ± 7.7	0.364 ± 0.055	2.19 ± 0.38
Skin	101 ± 27	0.832 ± 0.211	1.77 ± 0.47
Spleen	185 ± 13	1.52 ± 0.08	0.0423 ± 0.0023
Testes	69.2 ± 5.2	0.569 ± 0.033	0.0782 ± 0.0054
Stomach ^c	NA ^d	NA	0.0940 ± 0.0069
Small intestine ^c	NA	NA	1.04 ± 0.04
Cecum ^c	NA	NA	4.20 ± 0.79
Large intestine ^c	NA	NA	1.71 ± 1.02

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.98 ± 0.01 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 7

**Tissue Distribution of Radioactivity 24 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male F-344 Rats^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	89.1 ± 47.0	1.08 ± 0.60	0.588 ± 0.326
Bladder	133 ± 10	1.59 ± 0.06	0.00312 ± 0.00054
Blood	83.6 ± 3.5	unity	0.404 ± 0.003
Brain	46.5 ± 7.1	0.555 ± 0.070	0.0277 ± 0.0030
Heart	66.4 ± 2.8	0.795 ± 0.033	0.0182 ± 0.0006
Kidney	325 ± 18	3.89 ± 0.15	0.213 ± 0.006
Liver	238 ± 26	2.85 ± 0.32	0.873 ± 0.100
Lung	127 ± 7	1.52 ± 0.11	0.0390 ± 0.0436
Muscle	27.3 ± 1.7	0.327 ± 0.007	1.22 ± 0.03
Skin	93.5 ± 1.7	1.12 ± 0.07	1.48 ± 0.09
Spleen	147 ± 23	1.76 ± 0.25	0.0327 ± 0.0041
Testes	42.0 ± 3.2	0.502 ± 0.025	0.0435 ± 0.0028
Stomach ^c	NA ^d	NA	0.375 ± 0.524
Small intestine ^c	NA	NA	0.469 ± 0.034
Cecum ^c	NA	NA	0.429 ± 0.158
Large intestine ^c	NA	NA	0.344 ± 0.109

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 1.05 ± 0.03 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 8

**Tissue Distribution Time Course of Radioactivity in Select Tissues following a
Single 1 mg/kg iv Dose of [¹⁴C]PAL to Male F-344 Rats^a**

Tissue	Percent of Administered Dose							
	0.25 h	0.5 h	1 h	2 h	4 h	8 h	24 h	
Blood ^b	5.80 ± 0.21	4.02 ± 0.32	2.28 ± 0.44	1.19 ± 0.06	0.887 ± 0.052	0.651 ± 0.028	0.404 ± 0.003	
Skin ^b	11.6 ± 0.5	8.80 ± 1.71	6.41 ± 1.03	3.97 ± 1.74	2.58 ± 0.45	1.77 ± 0.47	1.48 ± 0.09	
Muscle ^b	37.6 ± 1.2	21.2 ± 4.7	12.2 ± 5.8	7.00 ± 4.01	3.87 ± 0.67	2.19 ± 0.38	1.22 ± 0.03	
Kidney	1.69 ± 0.05	2.55 ± 0.44	2.91 ± 0.20	1.94 ± 0.24	0.947 ± 0.067	0.377 ± 0.023	0.213 ± 0.006	
Liver	9.07 ± 0.88	7.65 ± 1.31	5.30 ± 0.61	3.23 ± 0.40	2.55 ± 0.36	2.22 ± 0.35	0.873 ± 0.100	
Stomach ^c	1.82 ± 1.51	1.34 ± 0.80	0.753 ± 0.436	0.357 ± 0.103	0.159 ± 0.043	0.0940 ± 0.0069	0.375 ± 0.524	
Small Intestine ^c	13.1 ± 1.9	19.9 ± 5.8	29.9 ± 1.2	25.5 ± 3.3	4.29 ± 0.81	1.22 ± 0.04	0.469 ± 0.034	
Cecum ^c	1.24 ± 0.12	1.27 ± 0.27	1.61 ± 0.32	3.91 ± 2.27	11.9 ± 2.4	4.20 ± 0.79	0.429 ± 0.158	
Large Intestine ^c	0.780 ± 0.114	0.657 ± 0.215	0.748 ± 0.068	0.453 ± 0.169	1.90 ± 0.78	1.71 ± 1.02	0.344 ± 0.109	

^a All values expressed as mean ± S.D. (N=4). See Table 1 for actual delivered dose.

^b The percent dose recovered in the blood, muscle, and skin are estimated values based on the assumption that these tissues account for 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

Table 9

**Tissue Distribution of Radioactivity 0.25 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	176 ± 113	0.216 ± 0.124	1.57 ± 0.85
Bladder	942 ± 492	1.16 ± 0.53	0.102 ± 0.068
Blood	793 ± 52	unity	5.73 ± 0.26
Brain	365 ± 52	0.458 ± 0.039	0.473 ± 0.021
Heart	620 ± 103	0.779 ± 0.089	0.305 ± 0.017
Kidney	1870 ± 193	2.36 ± 0.21	2.90 ± 0.24
Liver	2280 ± 376	2.88 ± 0.43	10.3 ± 1.7
Lung	671 ± 122	0.842 ± 0.103	0.335 ± 0.033
Muscle	477 ± 85	0.600 ± 0.087	20.0 ± 3.1
Skin	549 ± 105	0.688 ± 0.091	7.50 ± 1.22
Spleen	491 ± 92	0.616 ± 0.079	0.138 ± 0.019
Testes	438 ± 68	0.550 ± 0.050	0.305 ± 0.018
Stomach ^c	NA ^d	NA	2.64 ± 1.28
Small intestine ^c	NA	NA	17.9 ± 2.1
Cecum ^c	NA	NA	0.881 ± 0.227
Large intestine ^c	NA	NA	0.605 ± 0.139

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 1.05 ± 0.08 mg PAL/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 10

**Tissue Distribution of Radioactivity 0.5 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	121 ± 61	0.273 ± 0.148	1.23 ± 0.58
Bladder	722 ± 289	1.61 ± 0.68	0.0992 ± 0.0440
Blood	452 ± 23	unity	3.65 ± 0.29
Brain	192 ± 4	0.425 ± 0.018	0.297 ± 0.029
Heart	365 ± 23	0.810 ± 0.087	0.212 ± 0.006
Kidney	2250 ± 433	5.00 ± 1.10	4.08 ± 0.61
Liver	895 ± 149	1.98 ± 0.32	4.39 ± 0.84
Lung	392 ± 29	0.870 ± 0.106	0.247 ± 0.067
Muscle	216 ± 3	0.480 ± 0.022	10.3 ± 0.6
Skin	332 ± 43	0.740 ± 0.130	5.07 ± 0.60
Spleen	358 ± 60	0.797 ± 0.162	0.113 ± 0.024
Testes	212 ± 37	0.468 ± 0.079	0.150 ± 0.013
Stomach ^c	NA ^d	NA	1.42 ± 0.94
Small intestine ^c	NA	NA	34.8 ± 8.2
Cecum ^c	NA	NA	0.965 ± 0.124
Large intestine ^c	NA	NA	0.651 ± 0.182

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.93 ± 0.03 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 11

**Tissue Distribution of Radioactivity 1 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	ng-eq PAL per g Tissue		Tissue/Blood Ratio		% Dose in Total Tissue ^b
Adipose	191	± 103	0.826	± 0.495	1.97 ± 1.08
Bladder	3940	± 4630	15.3	± 16.3	0.621 ± 0.744
Blood	239	± 26	unity		1.93 ± 0.25
Brain	145	± 26	0.606	± 0.061	0.229 ± 0.037
Heart	234	± 47	0.974	± 0.113	0.133 ± 0.015
Kidney	2730	± 705	11.4	± 2.8	4.80 ± 0.88
Liver	616	± 134	2.56	± 0.30	2.94 ± 0.59
Lung	261	± 39	1.09	± 0.09	0.160 ± 0.018
Muscle	116	± 26	0.483	± 0.062	5.60 ± 1.51
Skin	190	± 51	0.788	± 0.141	2.91 ± 0.78
Spleen	347	± 60	1.45	± 0.25	0.109 ± 0.005
Testes	238	± 53	1.01	± 0.28	0.190 ± 0.042
Stomach ^c	NA ^d		NA		0.840 ± 0.382
Small intestine ^c	NA		NA		33.8 ± 4.9
Cecum ^c	NA		NA		2.75 ± 2.66
Large intestine ^c	NA		NA		0.779 ± 0.335

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.94 ± 0.05 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 12

**Tissue Distribution of Radioactivity 2 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	ng-eq PAL per g Tissue		Tissue/Blood Ratio		% Dose in Total Tissue ^b	
Adipose	106	± 44	0.835	± 0.487	1.07	± 0.45
Bladder	4040	± 3230	32.7	± 28.4	0.666	± 0.550
Blood	138	± 30	unity		1.08	± 0.21
Brain	107	± 17	0.789	± 0.101	0.158	± 0.033
Heart	148	± 27	1.09	± 0.21	0.0846	± 0.0168
Kidney	1170	± 239	9.06	± 3.41	2.06	± 0.47
Liver	338	± 49	2.49	± 0.24	1.64	± 0.24
Lung	174	± 39	1.30	± 0.34	0.101	± 0.025
Muscle	94.2	± 39.4	0.666	± 0.130	4.37	± 1.77
Skin	142	± 49	1.05	± 0.38	2.12	± 0.69
Spleen	236	± 39	1.75	± 0.35	0.0828	± 0.0242
Testes	85.5	± 13.3	0.631	± 0.092	0.0672	± 0.0086
Stomach ^c	NA ^d		NA		0.237	± 0.078
Small intestine ^c	NA		NA		7.99	± 2.35
Cecum ^c	NA		NA		14.4	± 2.9
Large intestine ^c	NA		NA		4.07	± 2.21

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.96 ± 0.03 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 13

**Tissue Distribution of Radioactivity 4 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	ng-eq PAL per g Tissue		Tissue/Blood Ratio		% Dose in Total Tissue ^b	
Adipose	154	± 155	1.52	± 1.37	1.46	± 1.42
Bladder	2150	± 1720	20.5	± 14.1	0.251	± 0.182
Blood	97.4	± 20.0	unity		0.750	± 0.148
Brain	129	± 38	1.30	± 0.13	0.182	± 0.040
Heart	115	± 29	1.18	± 0.18	0.0624	± 0.0126
Kidney	1060	± 519	10.5	± 3.6	1.76	± 0.73
Liver	413	± 76	4.43	± 1.57	1.83	± 0.38
Lung	179	± 82	1.80	± 0.54	0.113	± 0.030
Muscle	64.2	± 16.6	0.662	± 0.125	2.91	± 0.74
Skin	100	± 41	0.998	± 0.221	1.46	± 0.58
Spleen	354	± 157	3.75	± 2.10	0.112	± 0.071
Testes	111	± 40	1.20	± 0.62	0.0830	± 0.0294
Stomach ^c	NA ^d		NA		0.263	± 0.080
Small intestine ^c	NA		NA		2.75	± 1.04
Cecum ^c	NA		NA		4.53	± 2.81
Large intestine ^c	NA		NA		2.56	± 0.78

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.99 ± 0.04 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 14

**Tissue Distribution of Radioactivity 8 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	73.8 ± 62.6	1.34 ± 1.18	0.748 ± 0.652
Bladder	1860 ± 946	34.1 ± 19.1	0.248 ± 0.107
Blood	55.5 ± 3.1	unity	0.438 ± 0.022
Brain	43.1 ± 14.3	0.774 ± 0.254	0.0655 ± 0.0294
Heart	55.5 ± 17.2	0.995 ± 0.278	0.0339 ± 0.0101
Kidney	312 ± 41	5.63 ± 0.72	0.560 ± 0.060
Liver	248 ± 55	4.45 ± 0.80	1.06 ± 0.21
Lung	95.0 ± 12.6	1.71 ± 0.16	0.0599 ± 0.0033
Muscle	34.2 ± 6.9	0.615 ± 0.108	1.60 ± 0.26
Skin	58.3 ± 11.0	1.05 ± 0.20	0.865 ± 0.152
Spleen	158 ± 104	2.83 ± 1.76	0.0492 ± 0.0366
Testes	102 ± 76	1.81 ± 1.30	0.0824 ± 0.0614
Stomach ^c	NA ^d	NA	0.289 ± 0.214
Small intestine ^c	NA	NA	1.22 ± 0.60
Cecum ^c	NA	NA	1.62 ± 0.13
Large intestine ^c	NA	NA	1.17 ± 0.51

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.96 ± 0.03 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 15

**Tissue Distribution of Radioactivity 24 h following a Single 1 mg/kg
Intravenous Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	26.7 ± 12.9	0.758 ± 0.311	0.260 ± 0.120
Bladder	371 ± 60	10.8 ± 1.2	0.0576 ± 0.0191
Blood	34.6 ± 5.5	unity	0.267 ± 0.028
Brain	24.7 ± 5.5	0.708 ± 0.062	0.0383 ± 0.0099
Heart	29.2 ± 8.2	0.839 ± 0.150	0.0164 ± 0.0044
Kidney	151 ± 25	4.38 ± 0.29	0.256 ± 0.015
Liver	103 ± 20	2.96 ± 0.24	0.463 ± 0.103
Lung	52.7 ± 7.1	1.54 ± 0.20	0.0324 ± 0.0031
Muscle	17.2 ± 4.7	0.491 ± 0.089	0.782 ± 0.191
Skin	45.5 ± 14.8	1.30 ± 0.26	0.661 ± 0.184
Spleen	64.5 ± 10.3	1.87 ± 0.07	0.0184 ± 0.0036
Testes	26.2 ± 3.4	0.760 ± 0.043	0.0213 ± 0.0016
Stomach ^c	NA ^d	NA	0.0460 ± 0.0028
Small intestine ^c	NA	NA	0.365 ± 0.097
Cecum ^c	NA	NA	0.133 ± 0.022
Large intestine ^c	NA	NA	0.0808 ± 0.0374

^a All values expressed as mean ± S.D. (N=4). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.99 ± 0.05 mg/kg.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 16

**Tissue Distribution Time Course of Radioactivity in Select Tissues following
a Single 1 mg/kg iv Dose of [¹⁴C]PAL to Male B6C3F₁ Mice^a**

Tissue	Percent of Administered Dose						
	0.25 h	0.5 h	1 h	2 h	4 h	8 h	24 h
Blood ^b	5.73 ± 0.26	3.65 ± 0.29	1.93 ± 0.26	1.08 ± 0.21	0.750 ± 0.148	0.438 ± 0.022	0.267 ± 0.028
Skin ^b	7.50 ± 1.22	5.07 ± 0.60	2.91 ± 0.78	2.12 ± 0.69	1.46 ± 0.58	0.865 ± 0.152	0.661 ± 0.184
Muscle ^b	20.0 ± 3.1	10.3 ± 0.6	5.60 ± 1.51	4.37 ± 1.77	2.91 ± 0.74	1.60 ± 0.26	0.782 ± 0.191
Kidney	2.90 ± 0.24	4.08 ± 0.61	4.80 ± 0.88	2.06 ± 0.47	1.76 ± 0.73	0.560 ± 0.060	0.256 ± 0.015
Liver	10.3 ± 1.7	4.39 ± 0.84	2.94 ± 0.59	1.64 ± 0.24	1.83 ± 0.38	1.06 ± 0.21	0.463 ± 0.103
Stomach ^c	2.64 ± 1.28	1.42 ± 0.94	0.840 ± 0.382	0.237 ± 0.078	0.263 ± 0.080	0.289 ± 0.214	0.0460 ± 0.0028
Small Intestine ^c	17.9 ± 2.1	34.8 ± 8.2	33.8 ± 4.9	7.99 ± 2.35	2.75 ± 1.04	1.22 ± 0.60	0.365 ± 0.097
Cecum ^c	0.881 ± 0.227	0.965 ± 0.124	2.75 ± 2.66	14.4 ± 2.9	4.53 ± 2.81	1.62 ± 0.13	0.133 ± 0.022
Large Intestine ^c	0.605 ± 0.139	0.651 ± 0.182	0.779 ± 0.335	4.07 ± 2.21	2.56 ± 0.78	1.17 ± 0.51	0.0808 ± 0.0374

^a All values expressed as mean ± S.D. (N=4). See Table 1 for actual delivered dose.

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

Table 17

**Recovery of Radioactivity following Intravenous Administration
of 1 mg/kg [¹⁴C]PAL to Male F-344 Rats^a**

End of Collection Period (h)	Cumulative Percent Dose Excreted				
	Urine	Feces	Volatile Organics ^b	CO ₂ ^b	Total
6	40.2 ± 5.9	^c	0.3 ± 0.2	11.6 ± 0.9	52.2 ± 5.6
12	54.2 ± 3.4	1.4 ± 1.2	0.4 ± 0.2	16.4 ± 1.0	72.3 ± 2.9
24	60.1 ± 3.0	5.5 ± 0.6	0.4 ± 0.2	17.8 ± 1.0	83.9 ± 1.7
48	61.9 ± 2.8	6.3 ± 0.6	0.5 ± 0.2	18.6 ± 1.0	87.3 ± 1.5
72 ^d	62.3 ± 2.6	6.4 ± 0.6	0.5 ± 0.2	19.1 ± 1.1	88.4 ± 1.5

Tissue Distribution of Radioactivity 72 h following Dosing

Tissue Name	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue
Blood	57.2 ± 8.5	unity	0.312 ± 0.040
Kidney	181 ± 12	3.20 ± 0.44	0.136 ± 0.007
Liver	119 ± 14	2.11 ± 0.32	0.430 ± 0.023
Carcass	15.6 ± 1.8	0.276 ± 0.045	4.53 ± 0.25

Overall Percent Dose Recovered

% Dose Recovered in Tissues	% Dose Excreted	% Dose Recovered in Cage Rinse	Overall % Dose Recovered
5.3 ± 0.2	88.4 ± 1.5	0.3 ± 0.1	94.1 ± 1.3

^a All values expressed as mean ± S.D. (N=5). The target dose was 1 mg PAL/kg. The actual dose delivered was 0.94 ± 0.06 mg/kg.

^b Volatile organics and CO₂ in exhaled breath.

^c The first feces collection was 0–12 h.

^d 72 h urine collection includes urine present in the bladder at study termination.

Table 18

**Recovery of Radioactivity following Intravenous Administration
of 1 mg/kg [¹⁴C]PAL to Male B6C3F₁ Mice^a**

End of Collection Period (h)	Cumulative Percent Dose Excreted				
	Urine	Feces	Volatile Organics ^b	CO ₂ ^b	Total
6	8.8 ± 12.5	^c	0.65 ± 0.20	20.8 ± 3.1	30.2 ± 14.0
12	30.0 ± 10.0	5.3 ± 5.1	0.71 ± 0.22	22.7 ± 4.1	58.6 ± 8.4
24	35.5 ± 9.9	7.2 ± 2.0	0.78 ± 0.24	23.6 ± 4.1	67.1 ± 7.3
48	38.9 ± 9.6	8.4 ± 2.5	0.83 ± 0.26	25.3 ± 3.6	73.4 ± 6.7
72 ^d	40.0 ± 9.4	9.6 ± 2.8	0.85 ± 0.28	25.6 ± 3.6	76.0 ± 5.1

Tissue Distribution of Radioactivity 72 h following Dosing

Tissue Name	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue
Blood	23.7 ± 2.6	unity	0.186 ± 0.018
Kidney	94.7 ± 7.6	4.02 ± 0.28	0.165 ± 0.014
Liver	70.4 ± 23.2	2.96 ± 0.88	0.358 ± 0.093
Carcass ^e	10.3 ± 1.3	0.445 ± 0.101	2.88 ± 0.35

Overall Percent Dose Recovered

% Dose Recovered in Tissues	% Dose Excreted	% Dose Recovered in Cage Rinse	Overall % Dose Recovered
0.710 ± 0.106	76.0 ± 5.1	4.2 ± 2.8	83.6 ± 4.0

^a All values expressed as mean ± S.D. (N=5). The target dose was 1 mg PAL/kg. The actual dose delivered was 1.06 ± 0.05 mg/kg.

^b Volatile organics and CO₂ in exhaled breath.

^c The first feces collection was 0–12 h.

^d 72 h urine collection includes urine present in bladder at study termination.

^e Includes results from tail clip.

Table 19

Cumulative Excretion of Radioactivity in Bile by Male F-344 Rats following Intravenous Administration of [¹⁴C]PAL (1 mg/kg)^a

End of Collection Period (h)	Cumulative Percent Dose Excreted				
	F M2 ^b	F M3	F M5	F M6	Mean ± SD
0.5	16.6	17.4	12.7	9.46	14.0 ± 3.7
1.0	40.5	45.8	34.7	26.5	36.9 ± 8.3
1.5	53.4	58.0	50.1	39.8	50.3 ± 7.7
2.0	59.7	64.3	51.0	46.1	55.3 ± 8.2
2.5	62.6	67.3	56.2	49.0	58.7 ± 7.9
3.0	64.0	68.8	58.4	50.4	60.4 ± 7.9
3.5	64.6	69.1	59.9	51.1	61.2 ± 7.7
4.0	65.0	69.6	60.8	51.5	61.7 ± 7.7

^a See Table 1 for actual delivered dose.

^b F M2, F M3, F M5, F M6 = Individual animal codes; refer to Table 1.

Table 20

**Recovery of Radioactivity Following Oral Administration
of 50 mg/kg [¹⁴C]PAL to Male F-344 Rats^a**

End of Collection Period (h)	Cumulative Percent Dose Excreted				
	Urine	Feces	Volatile Organics ^b	CO ₂ ^b	Total
6	20.1 ± 1.0	^c	0.12 ± 0.02	5.9 ± 0.4	26.1 ± 1.0
12	31.0 ± 1.4	2.7 ± 2.2	0.15 ± 0.03	15.7 ± 1.0	49.5 ± 2.4
24	41.3 ± 3.2	10.7 ± 1.6	0.17 ± 0.04	21.0 ± 2.2	73.2 ± 5.8
48	49.1 ± 2.3	13.6 ± 1.2	0.19 ± 0.04	25.2 ± 1.3	88.1 ± 0.4
72 ^d	49.8 ± 2.5	14.0 ± 1.3	0.20 ± 0.04	26.0 ± 1.3	90.0 ± 0.7

Distribution in Tissues

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue
Adipose ^e	2260 ± 1010	0.831 ± 0.352	0.317 ± 0.139
Bladder	4600 ± 367	1.69 ± 0.12	0.00288 ± 0.00978
Blood ^e	2720 ± 129	unity	0.276 ± 0.007
Brain	1680 ± 128	0.617 ± 0.060	0.0241 ± 0.0015
Heart	2420 ± 75	0.892 ± 0.070	0.0153 ± 0.0011
Kidney	11500 ± 2660	4.20 ± 0.86	0.175 ± 0.037
Liver	9710 ± 468	3.57 ± 0.29	0.789 ± 0.096
Lung	3400 ± 140	1.25 ± 0.04	0.0258 ± 0.0027
Muscle ^e	1110 ± 104	0.408 ± 0.043	1.05 ± 0.10
Skin ^e	4380 ± 340	1.61 ± 0.13	1.47 ± 0.11
Spleen	4050 ± 107	1.49 ± 0.10	0.0177 ± 0.0028
Testis	1510 ± 136	0.554 ± 0.056	0.0333 ± 0.0033
Stomach ^f	NA ^g	NA	0.0507 ± 0.0039
Small intestine ^f	NA	NA	0.183 ± 0.021
Cecum ^f	NA	NA	0.0810 ± 0.0084
Large intestine ^f	NA	NA	0.0652 ± 0.0054
Carcass ^h	NA	NA	0.773 ± 0.285

Overall Percent Dose Recovered

% Dose Recovered in Tissues	% Dose Excreted	% Dose Recovered in Cage Rinse	Overall % Dose Recovered
5.3 ± 0.4	90.0 ± 0.7	0.3 ± 0.1	95.7 ± 0.6

^a All values expressed as mean ± S.D. (N=5). The target dose was 50 mg PAL/kg. The actual dose delivered was 49.9 ± 0.2 mg/kg.

^b Volatile organics and CO₂ in exhaled breath.

^c The first feces collection was 0–12 h.

^d 72 h urine collection includes urine present in the bladder at study termination.

^e Percent of dose in these tissues calculated using the following percentages of body weight: adipose 7.0%, blood 5.2%, muscle 48%, and skin 17%.

^f Includes contents.

^g NA = Not applicable.

^h Carcass values are based on the residual digested carcass after the removal of the listed tissues (i.e., percent dose measured in skin, adipose, blood, and muscle was subtracted from the total percent dose measured in the carcass).

Table 21

**Recovery of Radioactivity following Oral Administration
of 50 mg/kg [¹⁴C]PAL to Male B6C3F₁ Mice^a**

End of Collection Period (h)	Cumulative Percent Dose Excreted				
	Urine	Feces	Volatile Organics ^b	CO ₂ ^b	Total
6	4.3 ± 6.3	c	0.17 ± 0.08	7.4 ± 5.1	11.9 ± 10.0
12	8.2 ± 6.7	6.5 ± 2.5	0.28 ± 0.11	13.5 ± 6.8	28.5 ± 8.1
24	20.0 ± 10.7	13.5 ± 8.7	0.41 ± 0.14	19.8 ± 2.3	53.7 ± 4.5
48	27.9 ± 14.0	18.0 ± 8.5	0.51 ± 0.18	21.6 ± 2.0	67.9 ± 4.6
72 ^d	29.9 ± 14.0	20.2 ± 9.3	0.58 ± 0.19	22.1 ± 2.1	72.7 ± 3.5

Distribution in Tissues

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue
Adipose ^e	1510 ± 214	1.35 ± 0.24	0.265 ± 0.044
Bladder	2330 ± 2440	2.19 ± 2.37	0.00753 ± 0.00727
Blood ^e	1120 ± 110	unity	0.149 ± 0.007
Brain	741 ± 101	0.663 ± 0.097	0.0236 ± 0.0059
Heart	918 ± 90	0.819 ± 0.039	0.0108 ± 0.0019
Kidney	6690 ± 1140	5.94 ± 0.66	0.216 ± 0.041
Liver	6110 ± 694	5.44 ± 0.15	0.459 ± 0.038
Lung	1290 ± 131	1.16 ± 0.17	0.0201 ± 0.0027
Muscle ^e	482 ± 36	0.433 ± 0.058	0.387 ± 0.042
Skin ^e	1840 ± 328	1.64 ± 0.20	0.473 ± 0.053
Spleen	1560 ± 75	1.40 ± 0.07	0.00753 ± 0.00128
Testis	712 ± 72	0.636 ± 0.055	0.0116 ± 0.0012
Stomach ^f	NA ^g	NA	0.0358 ± 0.0019
Small intestine ^f	NA	NA	0.120 ± 0.015
Cecum ^f	NA	NA	0.0362 ± 0.0090
Large intestine ^f	NA	NA	0.0388 ± 0.0033
Carcass ^h	NA	NA	0.129 ± 0.258

Overall Percent Dose Recovered

% Dose Recovered in Tissues	% Dose Excreted	% Dose Recovered in Cage Rinse	Overall % Dose Recovered
2.4 ± 0.2	72.7 ± 3.5	10.4 ± 4.0	85.5 ± 2.2

^a All values expressed as mean ± S.D. (N=4). The target dose was 50 mg PAL/kg. The actual dose delivered was 49.9 ± 0.1 mg/kg.

^b Volatile organics and CO₂ in exhaled breath.

^c The first feces collection was 0–12 h.

^d 72 h urine collection includes urine present in the bladder at study termination.

^e Percent of dose in these tissues calculated using the following percentages of body weight: adipose 9.8%, blood 7.6%, muscle 45%, and skin 14.5%.

^f Includes contents.

^g NA = Not applicable.

^h Carcass values are based on the residual digested carcass after the removal of the listed tissues (i.e., percent dose measured in skin, adipose, blood, and muscle was subtracted from the total percent dose measured in the carcass.).

Table 22

**Recovery of Radioactivity following Dermal Administration
of 5 mg/kg [¹⁴C]PAL to Male F-344 Rats^a**

End of Collection Period (h)	Cumulative Percent Dose Excreted ^b				
	Urine	Feces	Volatile Organics ^c	CO ₂ ^c	Total
3	d	e	5.3 ± 0.9	d	5.3 ± 0.9
6	1.3 ± 0.6	e	8.1 ± 2.1	0.3 ± 0.1	9.7 ± 2.5
24 ^f	3.0 ± 0.7	0.5 ± 0.2	10.4 ± 0.8	0.7 ± 0.1	14.6 ± 1.7

**Overall Percent Dose Recovered
(Absorbed + Unabsorbed Dose)**

Percent Dose Absorbed					Total % Dose Absorbed
Excreta ^b	Cage Rinse	Blood	Dose Site Skin	Carcass	
14.6 ± 1.7	0.24 ± 0.06	0.02 ± 0.01	0.3 ± 0.1	0.3 ± 0.1	15.6 ± 1.8
Percent Dose Unabsorbed				Total % Dose Unabsorbed	Overall Percent Dose Recovered ^h
Foam Appliance	Charcoal Cover 1 st Extract	Charcoal Cover 2 nd Extract	Wash Gauze ^g and Dose Site Rinse		
1.2 ± 0.3	69.0 ± 1.9	4.7 ± 0.4	0.8 ± 0.2	75.4 ± 2.0	91.1 ± 1.4

^a All values expressed as mean ± S.D. (N=4). The target dose was 5 mg PAL/kg. The actual dose delivered was 6.4 ± 1.4 mg PAL/kg.

^b Assuming the radioactivity recovered as volatile organics was exhaled by the rats and not the result of [¹⁴C]PAL volatilizing from the dose site.

^c Volatile organics and CO₂ in exhaled breath.

^d The first collection was 0–6 h.

^e The first collection was 0–24 h.

^f 24 h urine collection includes urine present in the bladder at study termination.

^g Includes radioactivity recovered from 6 h and 24 h washes of the dose site.

^h Total recovery of absorbed and unabsorbed radiolabeled dose.

Table 23
Cumulative Excretion of Radioactivity by Male F-344 Rats and Male B6C3F₁ Mice
following a Single 6-h Nose-Only Inhalation Exposure to 1, 10, or 100 ppm [¹⁴C]PAL^a

End of Collection (h) ^b	Percent of Absorbed Dose						
	Urine	Feces	Exhaled Volatile Organics	Exhaled CO ₂	24-h Cage Rinse	Sampled Organs and Tissues ^c	Residual Carcass ^d
1 ppm – F-344 Rats (Study J)							
6	9.40 ± 4.62	e	-	-	-	-	-
12	42.4 ± 3.9	1.59 ± 0.69	10.7 ± 7.8	7.25 ± 1.27	-	-	-
24	52.6 ± 2.2	6.34 ± 0.72	16.8 ± 4.2	9.40 ± 1.40	1.77 ± 0.96	4.14 ± 0.17	5.97 ± 1.20
10 ppm – F-344 Rats (Study L)							
6	2.64 ± 5.24	e	-	-	-	-	-
12	30.5 ± 5.7	1.70 ± 1.42	15.1 ± 4.4	11.0 ± 0.4	-	-	-
24	42.1 ± 5.2	8.05 ± 1.46	17.6 ± 4.9	13.7 ± 1.0	1.68 ± 0.41	f	16.6 ± 2.9 ^f
100 ppm – F-344 Rats (Study K)							
6	9.15 ± 6.61	e	-	-	-	-	-
12	26.3 ± 7.1	0.711 ± 0.447	18.0 ± 3.4	13.8 ± 2.8	-	-	-
24	37.6 ± 4.9	7.22 ± 1.86	20.5 ± 3.2	17.6 ± 2.4	2.95 ± 1.89	5.75 ± 0.85	4.58 ± 1.50
1 ppm – B6C3F₁ Mice (Study J)							
6	e	e	-	-	-	-	-
12	19.1 ± 13.7	10.5 ± 2.4	14.0 ± 3.9	11.0 ± 4.7	-	-	-
24	42.6 ± 16.3	16.3 ± 6.4	15.3 ± 4.3	12.9 ± 5.4	4.61 ± 2.63	4.04 ± 1.86	4.82 ± 3.90
10 ppm – B6C3F₁ Mice (Study L)							
6	e	e	-	-	-	-	-
12	24.1 ± 8.6	5.46 ± 4.16	26.7 ± 10.0	6.91 ± 1.03	-	-	-
24	32.1 ± 6.7	13.1 ± 5.3	29.5 ± 11.5	8.18 ± 1.27	7.45 ± 6.59	f	9.57 ± 2.74 ^f
100 ppm – B6C3F₁ Mice (Study K)							
6	e	e	-	-	-	-	-
12	17.0 ± 11.6	19.0 ± 4.5	16.3 ± 5.9	13.2 ± 1.1	-	-	-
24	23.4 ± 11.2	24.4 ± 4.9	17.4 ± 6.7	16.5 ± 1.2	7.68 ± 3.06	5.53 ± 1.42	1.61 ± 1.30

^a Percent of absorbed dose. All values expressed as mean ± S.D. (N=4). Dash indicates no sample collected at that time point.

^b Urine and feces were collected at 0-6 h (during exposure), 12, and 24 h. Traps for the collection of exhaled volatile organics and CO₂ were changed at 12 and 24 h.

^c Radioactivity present in excised organs and sampled tissues of interest at 24 h.

^d Radioactivity present in the carcass at 24 h excluding excised organs and sampled tissues.

^e No urine and feces were produced for collection during exposure.

^f No tissues and organs were sampled for carbon-14 content at termination of study. Carcass includes carbon-14 in organs and tissues.

Table 24

**Tissue Distribution of Radioactivity in F-344 Rats 24 h following a Single
6-h Nose-Only Inhalation Exposure to [¹⁴C]PAL at 1 ppm^a**

Tissue	ng-eq PAL per g Tissue		Tissue/Blood Ratio		% Dose in Total Tissue^b	
Adipose	9.21	± 1.63	0.403	± 0.067	0.171	± 0.023
Bladder	54.6	± 5.6	2.40	± 0.28	0.00457	± 0.00038
Blood	22.8	± 0.5	unity		0.316	± 0.018
Brain	16.2	± 1.8	0.708	± 0.071	0.0341	± 0.0027
Heart	13.7	± 3.6	0.598	± 0.148	0.0119	± 0.0033
Kidney	101	± 11	4.41	± 0.49	0.212	± 0.017
Liver	54.4	± 6.0	2.38	± 0.24	0.652	± 0.062
Lung	29.8	± 3.7	1.31	± 0.17	0.0339	± 0.0034
Muscle	8.95	± 1.50	0.392	± 0.059	1.14	± 0.15
Spleen	41.7	± 2.3	1.83	± 0.12	0.0227	± 0.0013
Testes	14.5	± 0.7	0.635	± 0.037	0.0478	± 0.0033
Stomach ^c	NA ^d		NA		0.0840	± 0.0162
Small intestine ^c	NA		NA		0.464	± 0.039
Cecum ^c	NA		NA		0.651	± 0.107
Large intestine ^c	NA		NA		0.291	± 0.094

^a All values expressed as mean ± S.D. (N=4).

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7.0, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 25

Tissue Distribution of Radioactivity in B6C3F₁ Mice 24 h following a Single
6-h Nose-Only Inhalation Exposure to [¹⁴C]PAL at 1 ppm^a

Tissue	ng-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	76.2 ± 36.1	1.76 ± 0.53	0.681 ± 0.312
Bladder	155 ± 42	3.76 ± 0.95	0.0195 ± 0.0108
Blood	41.7 ± 7.7	unity	0.290 ± 0.091
Brain	24.7 ± 4.6	0.592 ± 0.019	0.0388 ± 0.0132
Heart	29.4 ± 5.6	0.706 ± 0.048	0.0168 ± 0.0073
Kidney	252 ± 32	6.09 ± 0.45	0.400 ± 0.116
Liver	93.9 ± 45.4	2.16 ± 0.68	0.449 ± 0.284
Lung	62.9 ± 15.1	1.50 ± 0.09	0.0369 ± 0.0139
Muscle	19.0 ± 10.2	0.441 ± 0.160	0.752 ± 0.351
Spleen	77.0 ± 23.1	1.83 ± 0.26	0.0215 ± 0.0107
Testes	29.4 ± 6.7	0.702 ± 0.032	0.0219 ± 0.0077
Stomach ^c	NA ^d	NA	0.0529 ± 0.0190
Small intestine ^c	NA	NA	0.375 ± 0.133
Cecum ^c	NA	NA	0.233 ± 0.167
Large intestine ^c	NA	NA	0.134 ± 0.085

^a All values expressed as mean ± S.D. (N=4).

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 26

**Tissue Distribution of Radioactivity in F-344 Rats 24 h following a Single
6-h Nose-Only Inhalation Exposure to [¹⁴C]PAL at 100 ppm^a**

Tissue	μg-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue^b
Adipose	0.718 ± 0.201	0.440 ± 0.112	0.219 ± 0.042
Bladder	7.20 ± 6.59	4.43 ± 4.06	0.00984 ± 0.0065
Blood	1.62 ± 0.10	Unity	0.373 ± 0.032
Brain	0.954 ± 0.190	0.587 ± 0.104	0.0324 ± 0.0069
Heart	1.28 ± 0.09	0.794 ± 0.058	0.0178 ± 0.0021
Kidney	6.73 ± 0.71	4.15 ± 0.30	0.234 ± 0.003
Liver	6.93 ± 0.94	4.28 ± 0.57	1.17 ± 0.10
Lung	2.54 ± 0.40	1.57 ± 0.24	0.0414 ± 0.0035
Muscle	0.549 ± 0.114	0.340 ± 0.077	1.16 ± 0.21
Spleen	2.67 ± 0.21	1.65 ± 0.11	0.0249 ± 0.0024
Testes	0.750 ± 0.045	0.463 ± 0.028	0.0400 ± 0.0028
Stomach ^c	NA ^d	NA	0.117 ± 0.046
Small intestine ^c	NA	NA	0.564 ± 0.096
Cecum ^c	NA	NA	1.01 ± 0.47
Large intestine ^c	NA	NA	0.733 ± 0.296

^a All values expressed as mean ± S.D. (N=4).

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 7.0, 5.2, 48, and 17% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.

Table 27

**Tissue Distribution of Radioactivity in B6C3F₁ Mice 24 h following a Single
6-h Nose-Only Inhalation Exposure to [¹⁴C]PAL at 100 ppm^a**

Tissue	μg-eq PAL per g Tissue	Tissue/Blood Ratio	% Dose in Total Tissue ^b
Adipose	3.93 ± 1.70	2.32 ± 0.49	0.845 ± 0.231
Bladder	5.95 ± 2.38	3.65 ± 1.27	0.0688 ± 0.104
Blood	1.68 ± 0.60	Unity	0.277 ± 0.022
Brain	1.20 ± 0.40	0.736 ± 0.187	0.0469 ± 0.0064
Heart	1.51 ± 0.45	0.923 ± 0.150	0.0198 ± 0.0016
Kidney	10.0 ± 5.1	5.81 ± 0.84	0.390 ± 0.086
Liver	10.3 ± 4.2	6.10 ± 0.89	1.22 ± 0.36
Lung	3.21 ± 1.06	1.94 ± 0.32	0.0465 ± 0.0051
Muscle	0.995 ± 0.724	0.549 ± 0.207	0.914 ± 0.394
Spleen	3.01 ± 0.71	1.87 ± 0.41	0.0150 ± 0.0017
Testes	1.04 ± 0.28	0.643 ± 0.147	0.0179 ± 0.0020
Stomach ^c	NA ^d	NA	0.557 ± 0.446
Small intestine ^c	NA	NA	0.610 ± 0.208
Cecum ^c	NA	NA	0.319 ± 0.113
Large intestine ^c	NA	NA	0.184 ± 0.077

^a All values expressed as mean ± S.D. (N=4).

^b The percent dose recovered in the adipose, blood, muscle, and skin are estimated values based on the assumption that these tissues account for 9.8, 7.6, 45, and 14.5% of the total body weight at sacrifice, respectively.

^c Includes contents.

^d NA = Not applicable.