

## SUPPLEMENTARY TABLES

Supplementary Table 1. List of perfluoroalkyl acids and fluorotelomers tested in rainbow trout.

Common name	Abbreviation	Molecular Formula	CAS No.
<i>Perfluoroalkyl carboxylic acids</i>			
Perfluoropentanoic acid	PFPA	C <sub>5</sub> HF <sub>9</sub> O <sub>2</sub>	2706-90-3
Perfluorohexanoic acid	PFH <sub>x</sub> A	C <sub>6</sub> HF <sub>11</sub> O <sub>2</sub>	307-24-4
Perfluoroheptanoic acid	PFHpA	C <sub>7</sub> HF <sub>13</sub> O <sub>2</sub>	375-85-9
Perfluorooctanoic acid	PFOA	C <sub>8</sub> HF <sub>15</sub> O <sub>2</sub>	335-67-1
Perfluorononanoic acid	PFNA	C <sub>9</sub> HF <sub>17</sub> O <sub>2</sub>	375-95-1
Perfluorodecanoic acid	PFDA	C <sub>10</sub> HF <sub>19</sub> O <sub>2</sub>	335-76-2
Perfluoroundecanoic acid	PFUnDA	C <sub>11</sub> HF <sub>21</sub> O <sub>2</sub>	2058-94-8
Perfluorododecanoic acid	PFDoDA	C <sub>12</sub> HF <sub>23</sub> O <sub>2</sub>	307-55-1
Perfluorotridecanoic acid	PFTTrDA	C <sub>13</sub> HF <sub>25</sub> O <sub>2</sub>	72629-94-8
Perfluorotetradecanoic acid	PFTDA	C <sub>14</sub> HF <sub>27</sub> O <sub>2</sub>	376-06-7
<i>Perfluoroalkyl sulfonates</i>			
Perfluorooctane sulfonic acid potassium salt	PFOS	C <sub>8</sub> HF <sub>17</sub> KO <sub>3</sub> S	2795-39-3
Perfluorodecane sulfonic acid ammonium salt	PFDS	C <sub>10</sub> H <sub>4</sub> F <sub>21</sub> NO <sub>3</sub> S	67906-42-7
<i>Fluorotelomers</i>			
6:2 Fluorotelomer alcohol	6:2FtOH	C <sub>8</sub> H <sub>5</sub> F <sub>13</sub> O	647-42-7
8:2 Fluorotelomer alcohol	8:2FtOH	C <sub>10</sub> H <sub>5</sub> F <sub>17</sub> O	678-39-7
8:2 Fluorotelomer acrylate	8:2FtOAc	C <sub>13</sub> H <sub>7</sub> F <sub>17</sub> O <sub>2</sub>	27905-45-9

Note: Chemical Abstract Service (CAS) registry numbers may be referenced at National Library of Medicine ChemID website: <http://chem.sis.nlm.nih.gov/chemidplus/>.

**Supplementary Table 2. Effects of select perfluoroalkyl acids and fluorotelomers (including a mixture) administered via the diet on morphological parameters in trout (experiment 1).**

Treatment	Diet (ppm)	Body wt (g)	Liver wt (g)	LSI (%)
Control	-	75.0 ± 4.4	0.66 ± 0.03	0.91 ± 0.03
Vehicle	-	73.1 ± 8.0	0.67 ± 0.06	0.94 ± 0.05
E2	5	82.9 ± 6.7	0.93 ± 0.10*	1.20 ± 0.05**
<i>C8 to C11 perfluoroalkyl carboxylic acids</i>				
PFOA	5	50.6 ± 6.0*	0.69 ± 0.04	1.43 ± 0.14**
	50	54.5 ± 9.3	0.65 ± 0.08	1.25 ± 0.09**
	250	62.2 ± 5.2	0.69 ± 0.19	1.12 ± 0.06**
PFNA	5	69.1 ± 8.8	0.70 ± 0.06	1.04 ± 0.06
	50	78.0 ± 6.2	0.74 ± 0.04	0.95 ± 0.03
	250	61.9 ± 7.1	0.65 ± 0.06	1.08 ± 0.05*
PFDA	5	63.5 ± 3.9	0.60 ± 0.03	0.95 ± 0.05
	50	85.2 ± 7.7	0.92 ± 0.11	1.11 ± 0.12
	250	63.2 ± 7.0	0.76 ± 0.08	1.31 ± 0.23*
PFUnDA	5	76.5 ± 10.5	0.80 ± 0.09	1.09 ± 0.11
	50	77.4 ± 7.7	0.62 ± 0.05	0.81 ± 0.05
	250	62.0 ± 3.3	0.64 ± 0.04	1.05 ± 0.06
Mixture <sup>a</sup>	20	78.9 ± 9.2	0.71 ± 0.07	0.92 ± 0.05
	200	78.6 ± 7.7	0.68 ± 0.03	0.89 ± 0.07
	1000	66.2 ± 4.2	0.81 ± 0.05	1.22 ± 0.05**
<i>Other perfluoroalkyl acids and fluorotelomers</i>				
PFHxA	250	64.2 ± 10.2	0.61 ± 0.08	0.98 ± 0.07
PFHpA	250	65.7 ± 4.6	0.63 ± 0.05	0.97 ± 0.06
PFDoDA	250	52.7 ± 5.6	0.83 ± 0.09	1.56 ± 0.05**
PFTTrDA	250	58.2 ± 5.4	0.60 ± 0.03	1.07 ± 0.09
PFOS	250	70.3 ± 5.9	0.70 ± 0.06	1.00 ± 0.05
PFDS	250	71.7 ± 7.4	0.77 ± 0.07	1.08 ± 0.04
6:2FtOH	250	73.1 ± 4.5	0.78 ± 0.05	1.07 ± 0.05
8:2FtOH	250	67.3 ± 9.0	0.83 ± 0.07	1.34 ± 0.21**
8:2FtOAc	250	68.3 ± 8.4	0.78 ± 0.07	1.16 ± 0.05*

*Note:* Mean body weight, liver weight and LSI values are shown ± SEM. Measurements were made following two weeks of dietary exposure to indicated treatments. \*,  $P < 0.05$ ; \*\*,  $P < 0.01$  compared to the Control treatment as determined by one-way ANOVA with Dunnett's multiple comparisons post-hoc test. Sample size differed among some groups because extra positive and negative controls were included for multiple sampling days. Sample sizes are as follows: control,  $N = 24$ ; E2,  $N = 12$ , all others  $N = 6$ . One death occurred in each of the PFDoDA and 8:2 FtOAc treatment groups.

<sup>a</sup>Mixtures were prepared by adding equal amounts of PFOA, PFNA, PFDA and PFUnDA to achieve indicated total perfluoroalkyl carboxylic acid concentrations as described in the *Materials and Methods*.

**Supplementary Table 3. PFOA and PFDA blood levels in rainbow trout following two-week dietary exposure and effects on morphological parameters (experiment 2).**

Treatment	Plasma PFOA ( $\mu\text{M}$ )	Plasma PFDA ( $\mu\text{M}$ )	Body weight (g)	Liver weight (g)	LSI (%)
Control	<LLQ	<LLQ	30.9 $\pm$ 8.2	0.27 $\pm$ 0.08	0.87 $\pm$ 0.11
5 ppm E2	<LLQ	<LLQ	28.6 $\pm$ 4.2	0.35 $\pm$ 0.06*	1.22 $\pm$ 0.08**
0.026	0.02 $\pm$ 0.01	nd <sup>a</sup>	29.1 $\pm$ 4.9	0.23 $\pm$ 0.09	0.85 $\pm$ 0.19
0.128	0.10 $\pm$ 0.03	nd	26.1 $\pm$ 7.5	0.21 $\pm$ 0.08	0.72 $\pm$ 0.21*
0.64 ppm PFOA	0.24 $\pm$ 0.08	nd	29.2 $\pm$ 5.7	0.24 $\pm$ 0.05	0.84 $\pm$ 0.13
3.2 ppm PFOA	2.43 $\pm$ 0.98	nd	28.8 $\pm$ 6.5	0.24 $\pm$ 0.05	0.80 $\pm$ 0.09
16 ppm PFOA	12.6 $\pm$ 3.95	nd	28.9 $\pm$ 7.4	0.23 $\pm$ 0.07	0.86 $\pm$ 0.14
80 ppm PFOA	46.6 $\pm$ 16.0	nd	26.0 $\pm$ 5.9	0.23 $\pm$ 0.05	0.76 $\pm$ 0.08
400 ppm PFOA	158 $\pm$ 25.7	nd	30.2 $\pm$ 5.2	0.25 $\pm$ 0.05	0.85 $\pm$ 0.15
2000 ppm PFOA	508 $\pm$ 99.7	nd	29.3 $\pm$ 3.0	0.33 $\pm$ 0.08	1.10 $\pm$ 0.15*
0.026 ppm PFDA	nd	0.09 $\pm$ 0.01	30.6 $\pm$ 5.8	0.30 $\pm$ 0.05	0.99 $\pm$ 0.17
0.128 ppm PFDA	nd	0.40 $\pm$ 0.07	29.7 $\pm$ 8.5	0.30 $\pm$ 0.11	1.00 $\pm$ 0.12
0.64 ppm PFDA	nd	2.29 $\pm$ 0.57	27.6 $\pm$ 2.9	0.29 $\pm$ 0.06	1.04 $\pm$ 0.15*
3.2 ppm PFDA	nd	10.7 $\pm$ 1.95	28.7 $\pm$ 4.9	0.26 $\pm$ 0.05	0.91 $\pm$ 0.09
16 ppm PFDA	nd	46.9 $\pm$ 11.1	31.4 $\pm$ 7.5	0.28 $\pm$ 0.07	0.88 $\pm$ 0.09
80 ppm PFDA	nd	246 $\pm$ 29.3	29.4 $\pm$ 7.6	0.29 $\pm$ 0.08	0.98 $\pm$ 0.16
400 ppm PFDA	nd	705 $\pm$ 96.2	30.2 $\pm$ 6.2	0.36 $\pm$ 0.09*	1.20 $\pm$ 0.17**
2000 ppm PFDA	nd	1365 $\pm$ 300	25.9 $\pm$ 4.2	0.38 $\pm$ 0.07*	1.45 $\pm$ 0.09**

*Note:* Nominal concentrations of PFOA or PFDA in the diet (mg/kg) are indicated. Average measured plasma PFOA or PFDA blood concentration, body weight, liver weight and LSI values are shown  $\pm$  SEM ( $N = 16$  for Control and E2 groups;  $N = 8$  for all PFOA and PFDA groups). For liver weight and LSI values, \* indicates  $p < 0.05$  and \*\* indicates  $p < 0.01$  compared to the Control treatment as determined by one-way ANOVA with Dunnett's multiple comparisons post-hoc test. The lower limit of quantitation (LLQ) for PFOA and PFDA was 5 ng/ml plasma or 12 nM and 9.7 nM, respectively.

<sup>a</sup> nd, not determined