

**Fig. 30.**  
 Growth curves during the lactation period of offspring exposed perinatally to tetrabromobisphenol A (TBBPA) during the period from the mid-gestation to the end of lactation.

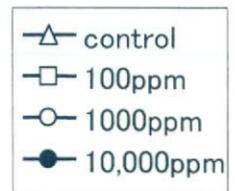
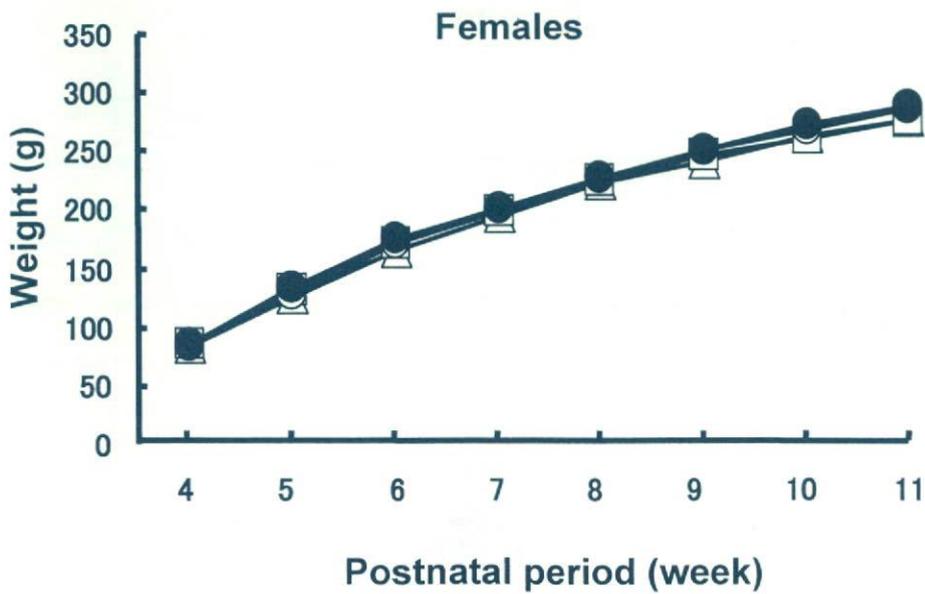
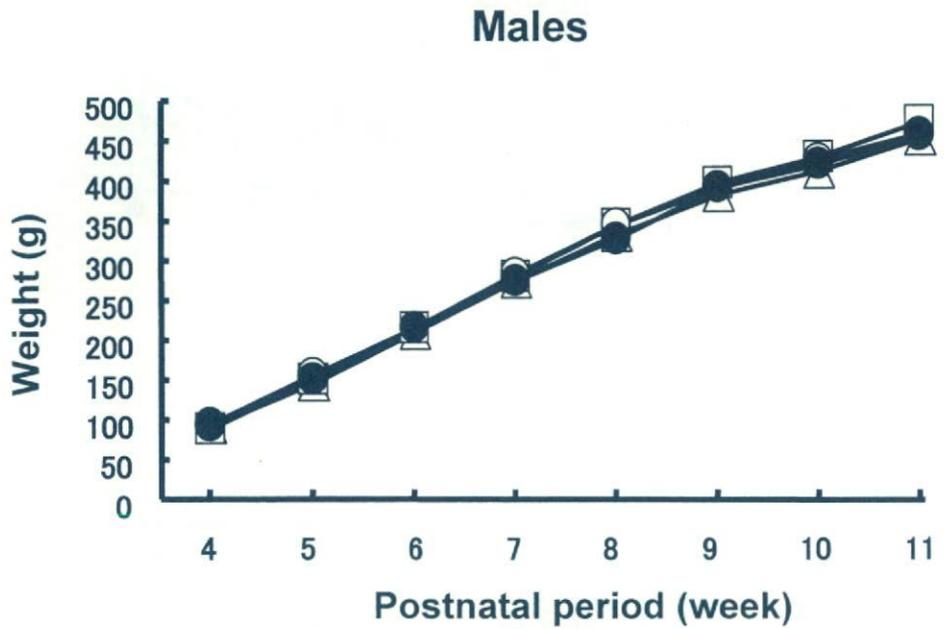
**Table 26.**  
**Effects on dams and offspring until prepubertal necropsy with exposure study of tetrabromobisphenol A during the period from the mid-gestation to the end of lactation**

	TBBPA in diet (ppm)				
	0	100	1000	10,000	
No. of dams examined	8	8	8	8	
Maternal parameter					
Body weight gain (g/day)					
GD 10-GD 20	11.33 ± 1.40 <sup>a</sup>	11.66 ± 1.50	11.39 ± 1.30	11.55 ± 0.90	
PND 2-PND 10	6.58 ± 2.80	7.16 ± 1.96	6.30 ± 1.95	6.80 ± 1.68	
PND 10-PND 21	0.31 ± 0.59	0.53 ± 0.73	0.46 ± 0.65	1.36 ± 0.70*	
PND 21					
BW (g)	335.4 ± 25.0	334.0 ± 23.5	328.6 ± 26.3	338.4 ± 24.7	
Thyroid weight (mg/100 g BW)	5.81 ± 1.24	6.41 ± 0.89	6.28 ± 0.67	6.67 ± 0.97	
Offspring parameter					
No. of implantation sites	13.9 ± 1.9	13.5 ± 2.4	13.3 ± 3.2	14.0 ± 1.1	
No. of live offspring	12.8 ± 2.6	12.8 ± 3.0	12.4 ± 3.1	13.1 ± 0.6	
Male ratio (%)	51.9 ± 13.8	47.3 ± 14.2	47.8 ± 9.5	51.7 ± 15.6	
BW, PND 2 (g)					
Males	7.59 ± 0.71	7.51 ± 1.04	7.49 ± 1.04	6.90 ± 0.35	
Females	7.17 ± 0.80	7.06 ± 0.92	6.96 ± 0.94	6.60 ± 0.32	
AGD, PND 2 (mm)					
Males	4.15 ± 0.22	4.01 ± 0.20	4.05 ± 0.24	4.00 ± 0.17	
Females	2.03 ± 0.13	1.95 ± 0.12	2.03 ± 0.09	2.00 ± 0.08	
Relative organ weights, PND 21					
	No. of offspring examined	10	10	10	10
Males					
BW (g)		54.3 ± 4.4	53.0 ± 5.9	59.0 ± 7.0	52.6 ± 3.0
Liver (g/100g BW)		3.88 ± 0.25	3.60 ± 0.41	3.91 ± 0.25	3.76 ± 0.20
Kidneys (g/100g BW)		1.14 ± 0.06	1.12 ± 0.07	1.09 ± 0.08	1.11 ± 0.06
Brain (g/100g BW)		2.77 ± 0.18	2.88 ± 0.26	2.64 ± 0.32	2.82 ± 0.19
Spleen (g/100g BW)		0.39 ± 0.06	0.38 ± 0.09	0.37 ± 0.05	0.35 ± 0.06
Thymus (g/100g BW)		0.39 ± 0.06	0.37 ± 0.08	0.40 ± 0.03	0.37 ± 0.06
Adrenals (mg/100g BW)		26.3 ± 6.5	24.9 ± 4.2	29.0 ± 2.4	29.0 ± 2.8
Testes (g/100g BW)		0.42 ± 0.04	0.40 ± 0.04	0.41 ± 0.03	0.40 ± 0.05
Epididymides (g/100g BW)		0.065 ± 0.013	0.061 ± 0.007	0.065 ± 0.010	0.062 ± 0.007
Females					
BW (g)		50.4 ± 4.3	51.1 ± 5.1	53.3 ± 5.6	52.4 ± 2.7
Liver (g/100g BW)		3.86 ± 0.19	3.86 ± 0.14	3.94 ± 0.32	3.84 ± 0.20
Kidneys (g/100g BW)		1.17 ± 0.05	1.18 ± 0.06	1.13 ± 0.09	1.16 ± 0.10
Brain (g/100g BW)		2.90 ± 0.17	2.83 ± 0.20	2.75 ± 0.28	2.77 ± 0.15
Spleen (g/100g BW)		0.39 ± 0.06	0.42 ± 0.08	0.37 ± 0.02	0.38 ± 0.06
Thymus (g/100g BW)		0.40 ± 0.07	0.39 ± 0.06	0.44 ± 0.05	0.42 ± 0.08
Adrenals (mg/100g BW)		21.6 ± 5.3	24.3 ± 4.5	23.3 ± 4.9	22.0 ± 5.8
Ovaries (mg/100g BW)		24.9 ± 7.8	30.0 ± 5.6	25.3 ± 10.5	27.1 ± 8.5
Uterus (g/100g BW)		0.069 ± 0.008	0.074 ± 0.013	0.068 ± 0.011	0.074 ± 0.012

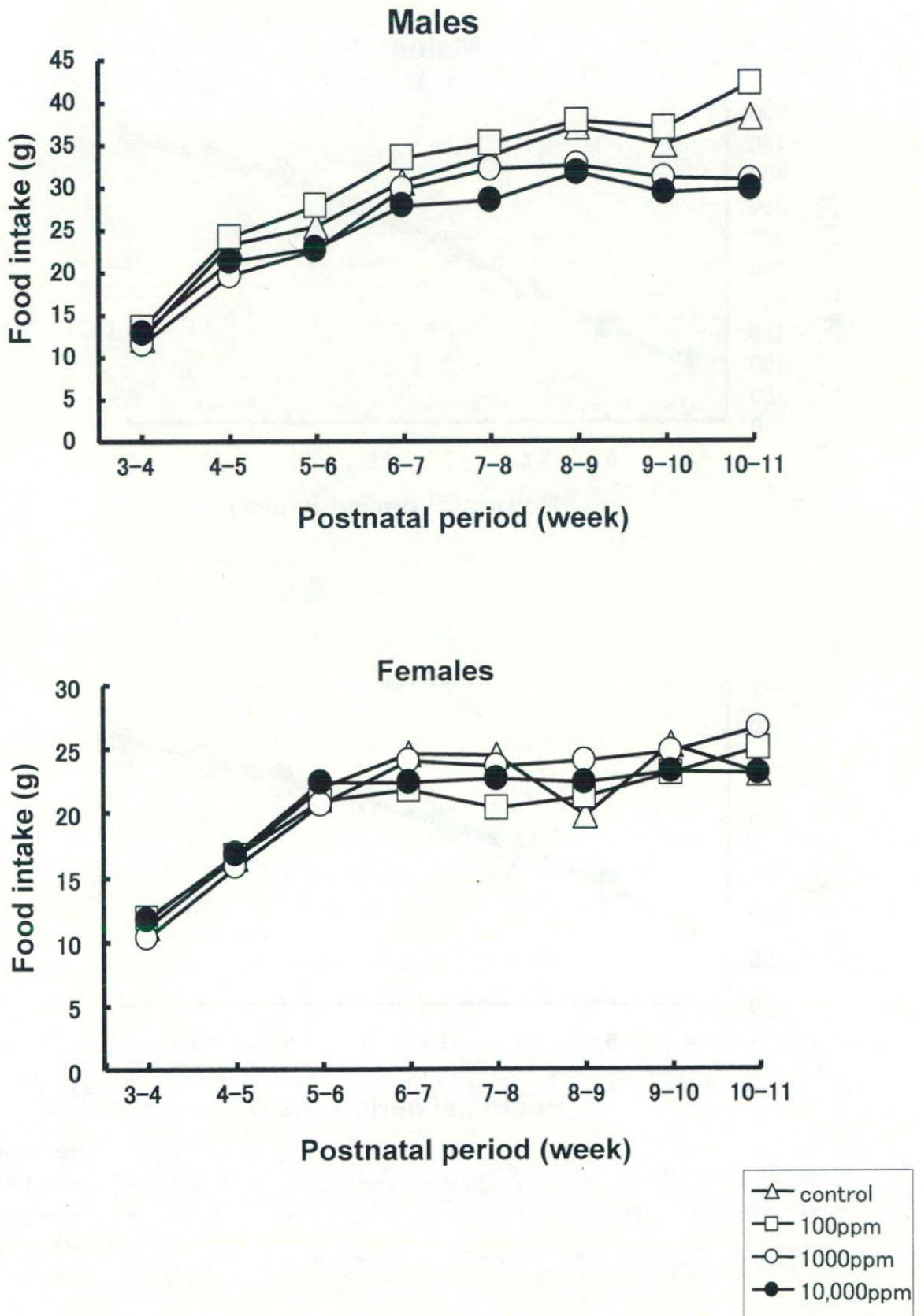
<sup>a</sup> Mean ± SD.

Abbreviations: TBBPA, tetrabromobisphenol A; GD, gestational day; PND, postnatal day; BW, body weight; AGD, anogenital distance.

\* Significantly different from the controls by Dunnett's test or Dunnett-type rank-sum test (\*  $p < 0.05$ ).



**Fig. 31.** Growth curves after weaning for offspring exposed perinatally to tetrabromobisphenol A (TBBPA) during the period from the mid-gestation to the end of lactation.



**Fig. 32.** Food intake of offspring exposed perinatally to tetrabromobisphenol A (TBBPA) during the period from the mid-gestation to the end of lactation.

**Table 27.****Onset of puberty and estrous cyclicity of the offspring exposed to tetrabromobisphenol A during the period from the mid-gestation to the end of lactation.**

	TBBPA in diet (ppm)			
	0	100	1000	10,000
Onset of puberty				
Males				
No. of animals examined	12	12	12	12
Age by day	41.0 ± 1.0 <sup>a</sup>	41.8 ± 1.5	41.2 ± 1.1	42.7 ± 2.1
BW	204.9 ± 12.0	218.2 ± 12.3	209.0 ± 14.7	221.2 ± 17.6*
Females				
No. of animals examined	12	12	12	12
Age by day	34.9 ± 1.6	33.3 ± 1.4	33.5 ± 1.9	34.1 ± 2.4
BW	129.2 ± 11.2	123.9 ± 11.8	122.1 ± 8.5	128.7 ± 16.0
Estrous cyclicity during PNW 8-11				
No. of animals examined	10	10	10	10
Irregularity (Extended diestrus)	0	0	1	2

<sup>a</sup> Mean ± SD.

Abbreviations: TBBPA, tetrabromobisphenol A; BW, body weight; PNW, postnatal week.

\* Significantly different from the controls by Dunnett's test or Dunnett-type rank-sum test (\* p &lt; 0.05).

**Table 28.****Serum levels of thyroid-related hormones of the offspring exposed to tetrabromobisphenol A during the period from the mid-gestation to the end of lactation.**

	TBBPA in diet (ppm)			
	0	100	1000	10,000
PND 21				
No. of offspring examined	10	10	10	10
T3 (ng/ml)	1.31 ± 0.12 <sup>a</sup>	1.13 ± 0.12*	1.15 ± 0.08*	1.20 ± 0.13
T4 (µg/dl)	4.86 ± 0.50	4.66 ± 0.64	4.85 ± 0.43	5.12 ± 0.52
TSH (ng/ml)	7.09 ± 1.32	6.68 ± 2.51	6.17 ± 1.78	5.45 ± 0.56
PNW 11				
No. of offspring examined	10	10	10	10
T3 (ng/ml)	0.89 ± 0.08	0.89 ± 0.05	0.92 ± 0.08	0.87 ± 0.04
T4 (µg/dl)	4.77 ± 0.53	5.11 ± 0.93	5.03 ± 0.40	4.49 ± 0.80
TSH (ng/ml)	7.12 ± 2.06	7.19 ± 2.23	6.72 ± 1.90	6.23 ± 1.62

<sup>a</sup> Mean ± SD.

Abbreviations: TBBPA, tetrabromobisphenol A; PND, postnatal day; PNW, postnatal week.

\* Significantly different from the controls by Dunnett's test or Dunnett-type rank-sum test (\* p &lt; 0.01).

Table 29.

Body and organ weights of the offspring exposed to tetrabromobisphenol A during the period from the mid-gestation to the end of lactation examined at PNW 11.

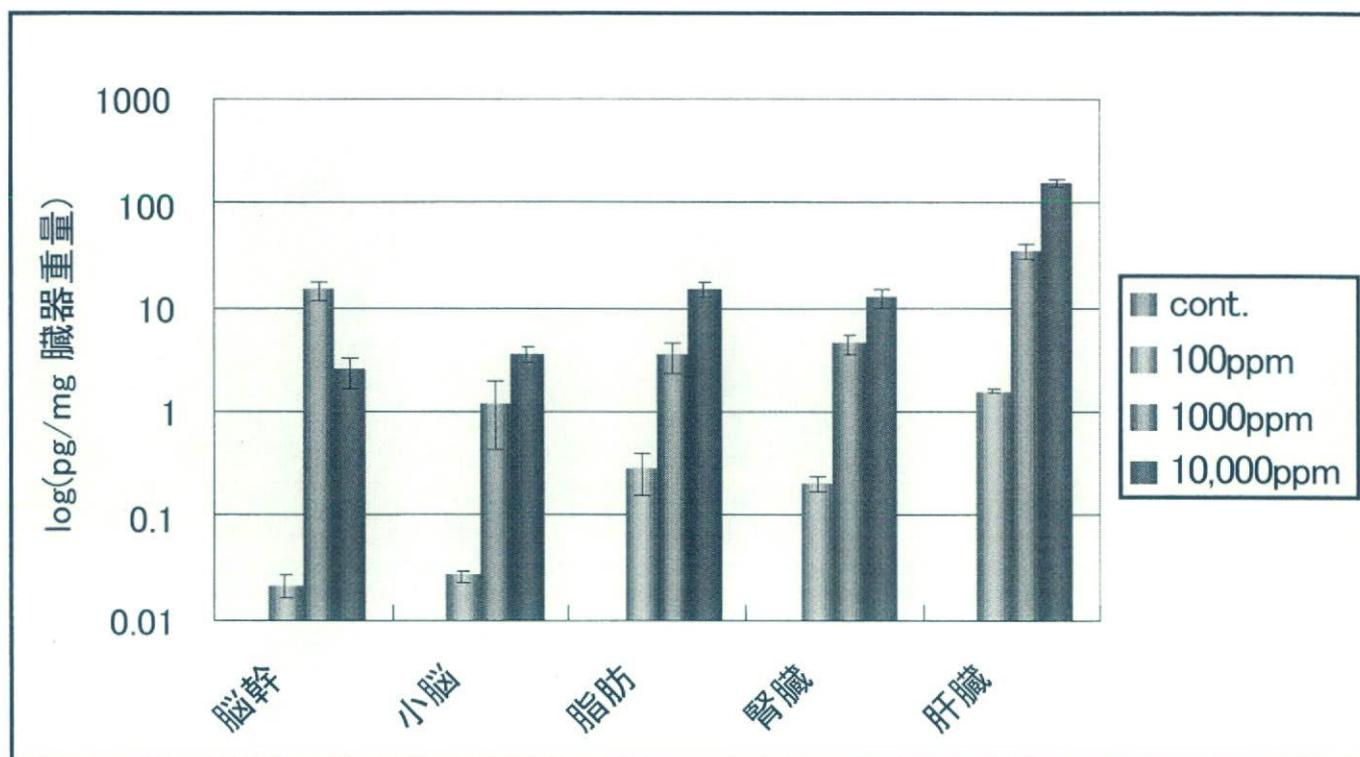
	TBBPA in diet (ppm)			
	0	100	1000	10,000
Relative organ weights, PNW 11				
Males				
No. of animals examined	10	10	10	10
BW (g)	456.1 ± 15.9 <sup>a</sup>	465.4 ± 29.1	452.6 ± 23.9	455.7 ± 33.3
Brain (g/100g BW)	0.48 ± 0.02	0.47 ± 0.02	0.47 ± 0.02	0.48 ± 0.04
Pituitary (mg/100g BW)	3.41 ± 0.38	3.32 ± 0.17	3.19 ± 0.21	3.37 ± 0.45
Spleen (g/100g BW)	0.19 ± 0.02	0.19 ± 0.03	0.19 ± 0.02	0.21 ± 0.04
Thymus (g/100g BW)	0.11 ± 0.03	0.13 ± 0.03	0.11 ± 0.02	0.14 ± 0.03
Liver (g/100g BW)	3.76 ± 0.18	3.68 ± 0.21	3.64 ± 0.28	3.53 ± 0.36
Kidneys (g/100g BW)	0.68 ± 0.04	0.69 ± 0.04	0.72 ± 0.05	0.69 ± 0.04
Adrenals (mg/100g BW)	12.4 ± 1.3	13.1 ± 1.7	12.6 ± 1.9	14.0 ± 2.3
Testes (g/100 g BW)	0.75 ± 0.08	0.72 ± 0.10	0.74 ± 0.11	0.76 ± 0.06
Epididymides (g/100g BW)	0.22 ± 0.02	0.21 ± 0.03	0.22 ± 0.03	0.23 ± 0.02
Prostate, ventral (mg/100g BW)	0.11 ± 0.02	0.12 ± 0.02	0.11 ± 0.02	0.12 ± 0.02
Prostate, dorso-lateral (mg/100g BW)	0.12 ± 0.01	0.12 ± 0.03	0.12 ± 0.02	0.12 ± 0.01
Seminal vesicles (mg/100g BW)	0.25 ± 0.03	0.24 ± 0.04	0.25 ± 0.02	0.25 ± 0.04
Thyroid (mg/100g BW)	4.72 ± 0.95	5.40 ± 0.96	5.09 ± 0.92	5.58 ± 0.86
Females				
No. of animals examined	10	10	10	10
BW (g)	285.4 ± 12.4	285.1 ± 20.7	289.7 ± 26.2	296.1 ± 25.0
Brain (g/100g BW)	0.70 ± 0.03	0.71 ± 0.6	0.68 ± 0.05	0.67 ± 0.06
Pituitary (mg/100g BW)	6.04 ± 0.58	6.16 ± 0.63	5.62 ± 0.93	5.82 ± 1.00
Spleen (g/100g BW)	0.22 ± 0.03	0.23 ± 0.05	0.19 ± 0.02	0.20 ± 0.02
Thymus (g/100g BW)	0.19 ± 0.04	0.16 ± 0.02	0.16 ± 0.03	0.20 ± 0.05
Liver (g/100g BW)	3.49 ± 0.25	3.47 ± 0.22	3.32 ± 0.20	3.51 ± 0.27
Kidneys (g/100g BW)	0.71 ± 0.04	0.70 ± 0.03	0.66 ± 0.05*	0.71 ± 0.04
Adrenals (mg/100g BW)	24.2 ± 3.5	25.4 ± 2.4	22.8 ± 2.5	24.3 ± 2.8
Ovaries (mg/100 g BW)	31.3 ± 3.8	34.9 ± 3.9	33.3 ± 3.2	34.6 ± 4.7
Uterus (g/100g BW)	0.18 ± 0.03	0.19 ± 0.03	0.18 ± 0.07	0.14 ± 0.02*
Thyroid (mg/100g BW)	7.19 ± 1.00	7.46 ± 1.78	6.60 ± 1.01	7.25 ± 1.09

<sup>a</sup> Mean ± SD.

Abbreviations: TBBPA, tetrabromobisphenol A; PNW, postnatal week.

\* Significantly different from the controls by Dunnett's test or Dunnett-type rank-sum test (\* p<0.05).

### 3週目



11週目 : 検索した全ての臓器でいずれの用量でも測定限界以下  
(0.02 pg/mg tissue以下)

Fig. 33. 各臓器におけるTBBPA蓄積量.

**Table 30.****Brain morphometry of the white matter components of the offspring exposed to tetrabromobisphenol A during the period from the mid-gestation to the end of lactation examined at PNW11.**

	TBBPA in diet (ppm)			
	0	100	1000	10,000
No. of offspring examined	10	10	10	10
CC region area (mm <sup>2</sup> )	0.14 ± 0.01 <sup>a</sup>	0.14 ± 0.01	0.14 ± 0.02	0.14 ± 0.01
CNPase-positive cell count (count/mm <sup>2</sup> )	133.0 ± 16.7	120.8 ± 14.3	121.4 ± 15.4	127.1 ± 18.8

<sup>a</sup>Mean±SD.

Abbreviations: TBBPA, tetrabromobisphenol A; CC, corpus callosum; PNW, postnatal week

**Table 31.**

**Morphometry of the hippocampal CA1 region in male offspring exposed to 1,2,5,6,9,10-hexabromocyclododecane (HBCD) during the period from the mid-gestation to the end of lactation. Analysis at PNW11.**

	HBCD in diet (ppm)			
	0	100	1000	10,000
No. of offspring examined	10	10	10	10
Mean distance of the location of neurons from the innermost margin of the pyramidal cell layer ( $\mu\text{m}$ ) <sup>a</sup>	50.9 ± 11.8 <sup>b</sup>	49.3 ± 9.1	47.2 ± 11.9	48.2 ± 2.3
No. of neurons located outside of the pyramidal cell layer (/mm baseline)	4.5 ± 1.3	4.9 ± 0.9	3.3 ± 1.1	3.5 ± 1.1
Ratio of abnormally migrated neurons /total neurons (%)	2.9 ± 1.0	3.1 ± 0.6	2.3 ± 0.9	2.3 ± 0.7

<sup>a</sup> NeuN (+) neurons were subjected to analysis.

<sup>b</sup> Mean ± SD.

Abbreviations: HBCD, 1,2,5,6,9,10-hexabromocyclododecane; PNW, postnatal week.

**Table 32.**

**Histopathologic findings of male and female offspring exposed to 1,2,5,6,9,10-hexabromocyclododecane (HBCD) during the period from the mid-gestation to the end of lactation.**

	HBCD in diet (ppm)			
	0	100	1000	10,000
<b>PND 21</b>				
<i>Males</i>				
No. of animals examined	10	10	10	10
Liver				
Vacuolar degeneration, hepatocytes, diffuse (+/++) <sup>a</sup>	0	0	0	6 <sup>b</sup> * (6/0) <sup>c</sup>
Increased eosinophilia, hepatocytes, diffuse (+)	0	0	0	1
Focal necrosis, hepatocytes	0	0	0	1
<i>Females</i>				
No. of animals examined	10	10	10	10
Liver				
Vacuolar degeneration, hepatocytes, diffuse (+/++)	0	0	0	6 * (0/6)
<b>PNW 11</b>				
<i>Males</i>				
No. of animals examined	10	10	10	10
Adrenals				
Vacuolar degeneration, fasciculate zone, cortex ( $\pm$ /+)	0	0	0	4 * (2/2)
Kidneys				
Chronic nephropathy (+/++)	9 (9/0)	10 (5/5) <sup>#</sup>	10 (3/7) <sup>##</sup>	10 (5/5) <sup>#</sup>

<sup>a</sup> Grade of change: ( $\pm$ ), minimal, (+), slight; (++) , moderate.

<sup>b</sup> Total No. of animals with each finding.

<sup>c</sup> No. of animals with each grade.

\* \*\* Significantly different from the 0 ppm control by Fisher's exact probability test (\* $p$  < 0.05, \*\* $p$  < 0.01).

<sup>#,##</sup> Significantly different from the 0 ppm control by Mann-Whitney's  $U$ -test (<sup>#</sup> $p$  < 0.05, <sup>##</sup> $p$  < 0.01).

Abbreviations: HBCD, 1,2,5,6,9,10-hexabromocyclododecane; PND, postnatal day; PNW, postnatal week.

**Table 33.****Histopathologic findings of the thyroid of dams exposed to 1,2,5,6,9,10-hexabromocyclododecane (HBCD) during the period from the mid-gestation to the end of lactation.**

	HBCD in diet (ppm)			
	0	100	1000	10,000
PND 21				
No. of dams examined	10	10	10	10
Thyroid				
Diffuse follicular cell hypertrophy ( $\pm$ /+/++/+++) <sup>a</sup>	3 <sup>b</sup> (0/3/0/0) <sup>c</sup>	5 (2/3/0/0)	6 (1/3/2/0)	9* (0/3/4/2)

<sup>a</sup> Grade of change: ( $\pm$ ), minimal, (+), slight; (++) , moderate, (+++), severe.<sup>b</sup> Total No. of animals with each finding.<sup>c</sup> No. of animals with each grade.\* Significantly different from the 0 ppm control by Fisher's exact probability test ( $p < 0.05$ ).

Abbreviations: HBCD, 1,2,5,6,9,10-hexabromocyclododecane; PND, postnatal day.

**Table 34.****Morphometry of the hippocampal CA1 region in male offspring exposed to tetrabromobisphenol A (TBBPA) during the period from the mid-gestation to the end of lactation. Analysis at PNW11.**

	TBBPA in diet (ppm)			
	0	100	1000	10,000
No. of offspring examined	10	10	10	10
Hippocampal CA1 neurons				
Mean distance of the location of neurons from the innermost margin of the pyramidal cell layer ( $\mu$ m) <sup>a</sup>	30.9 $\pm$ 3.0 <sup>b</sup>	29.8 $\pm$ 2.0	31.5 $\pm$ 1.8	29.2 $\pm$ 1.6
No. of neurons located outside of the pyramidal cell layer (/mm baseline)	5.1 $\pm$ 1.4	4.7 $\pm$ 1.5	4.0 $\pm$ 1.6	4.6 $\pm$ 1.7
Ratio of abnormally migrated neurons /total neurons (%)	2.3 $\pm$ 0.6	1.9 $\pm$ 0.5	1.7 $\pm$ 0.6	1.9 $\pm$ 0.7

<sup>a</sup> NeuN (+) neurons were subjected to analysis.<sup>b</sup> Mean  $\pm$  SD.

Abbreviations: TBBPA, tetrabromobisphenol A; PNW, postnatal week.

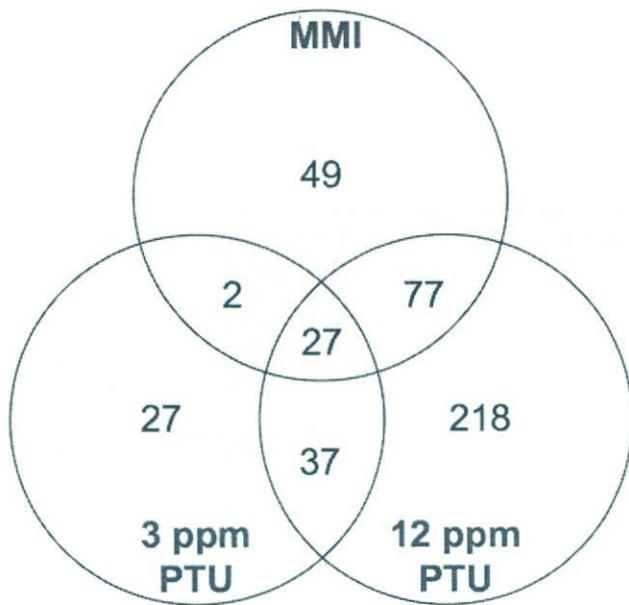
**Table 35.****Histopathologic findings of the thyroid of dams exposed to tetrabromobisphenol A (TBBPA) during the period from the mid-gestation to the end of lactation.**

	TBBPA in diet (ppm)			
	0	100	1000	10,000
PND 21				
No. of dams examined	10	10	10	10
Thyroid				
Diffuse follicular cell hypertrophy ( $\pm$ /+/++) <sup>a</sup>	3 <sup>b</sup> (1/1/1) <sup>c</sup>	3 (1/2/0)	7 (3/4/0)	7 (5/2/0)

<sup>a</sup> Grade of change: ( $\pm$ ), minimal, (+), slight; (++) , moderate.<sup>b</sup> Total No. of animals with each finding.<sup>c</sup> No. of animals with each grade.

Abbreviations: TBBPA, tetrabromobisphenol A; PND, postnatal day.

Up-regulated ( $\geq 2$ -fold)



Down-regulated ( $\geq 1/2$ -fold)

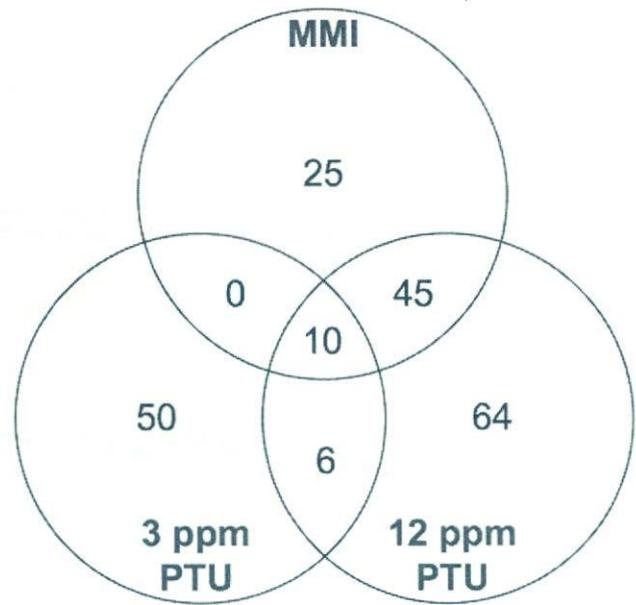


Fig. 34.

Venn diagram of genes showing altered expression in the hippocampal CA1 of rats at weaning exposed perinatally to PTU or MMI

**Table 36.**

**List of genes showing up- or down-regulation in the hippocampal CA1 common to anti-thyroid agents at PND 21 ( $\geq 2$ -fold or  $\leq 0.5$ -fold,  $p < 0.05$ )**

Accession No	Gene title	Symbol	12 ppm PTU	200 ppm MMI
<b>Up-regulated</b>				
NM_013002.1	Purkinge cell protein 4	Pcp4	4.72	4.51
BI304009	Lysyl oxidase	Lox	3.05	4.07
AA851939	FXD domain-containing ion transport regulator 6	Fxyd6	3.68	3.36
BI303923	Similar to integrin, beta-like 1		2.62	2.23
NM_031315.1	Cytosolic acyl-CoA thioesterase 1	Cte1	2.44	2.24
BI284420	Similar to retinoic acid-responsive protein; STRA6		2.25	2.35
NM_012892.1	Amiloride-sensitive cation channel 1, neuronal (degenerin) ESTs: 9	Accn1	2.08	2.17
<b>Down-regulated</b>				
AA997477	Wingless-related MMTV integration site 2	Wnt2	0.26	0.45
NM_133303.1	Basic helix-loop-helix domain containing, class B3	Bhlhb3	0.28	0.35
AI317821	Protein tyrosine phosphatase, non-receptor type 3	Ptpn3	0.31	0.33
BI282567	Kallikrein 8 (neurosin/ovasin)	Klk8	0.34	0.47
AA891760	Similar to hypothetical protein		0.36	0.38
AI101322	Histone deacetylase 11 EST: 1	Hdac11	0.43	0.46

Abbreviations: PTU, propylthiouracil; MMI, methimazole; PND, postnatal day; EST, expressed sequence tag.

**Table 37.**

**Function of genes showing altered expression in the hippocampal CA1 common to anti-thyroid agents at PND 21**

	Function	Relation with brain development
<b>Up-regulated genes:</b>		
Purkinge cell protein 4	sodium channel protein	○
Lysyl oxidase	crosslinks extracellular matrix proteins	○
FXD domain-containing ion transport regulator 6	ion transport regulator	?
integrin, beta-like 1	extracellular matrix protein	○
Cytosolic acyl-CoA thioesterase 1	Fatty acid oxidation	○
STRA6	Retinoic acid responsible gene, Wnt signal-mediated	○
Degenerin	Role for blood-organ barrier amiloride-sensitive epithelial Na channel	○
<b>Down-regulated genes:</b>		
Wingless-related MMTV integration site 2	Wnt2	○
Basic helix-loop-helix domain containing, class B3	transcription factor, neural differentiation-related	○
Protein tyrosine phosphatase, non-receptor type 3	Cell growth related signaling molecule	○
Kallikrein 8 (neurosin/ovasin)	Extracellular serine protease modulates neurite outgrowth and fasciculation	○
Histone deacetylase 11	associated with the thyroid hormone-regulated corepressor Hairless in neonatal brain	○

Up-regulated ( $\geq 2$ -fold)

Down-regulated ( $\geq 1/2$ -fold)

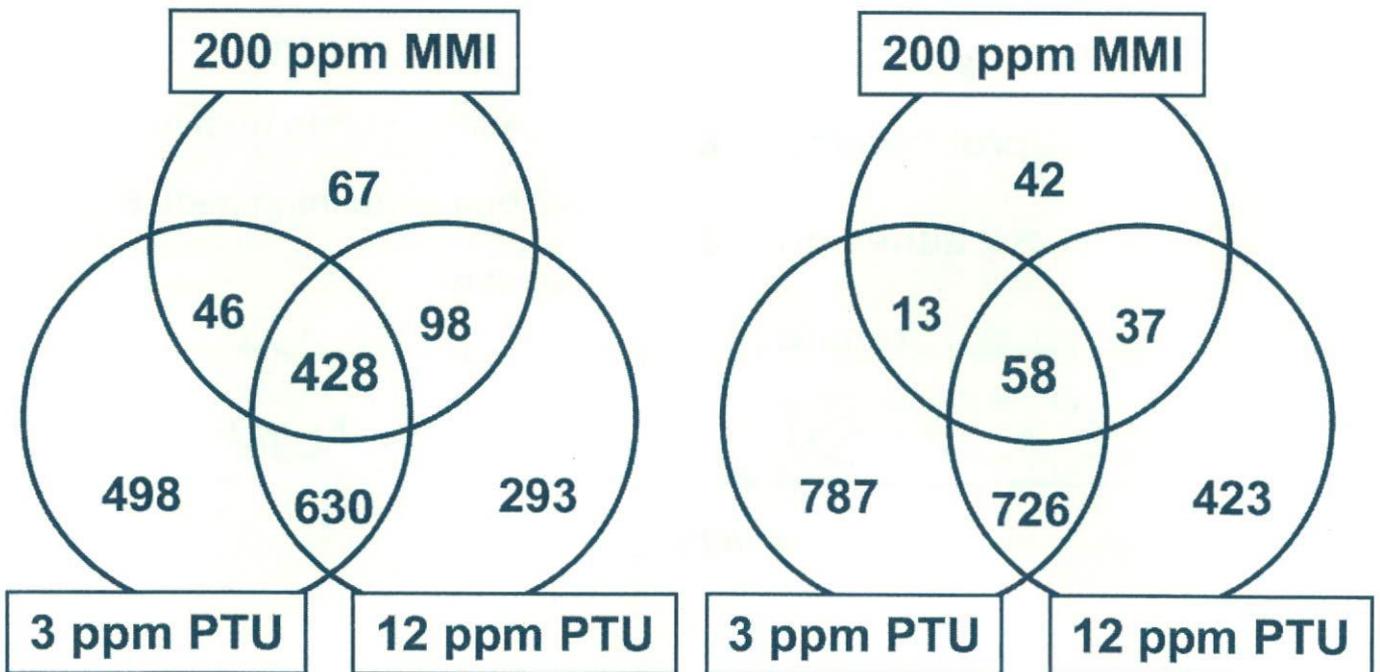


Fig. 35.

Venn diagram of genes showing altered expression in the white matter of rats at weaning exposed to anti-thyroid agents during the period from the mid-gestation to the end of lactation.

		example
neural	31	Nuclear receptor co-repressor 1
(central nervous system development)	22)	Ephrin A4
cell migration	17	Follistatin-like 3
apoptosis	12	Ret proto-oncogene
proliferation	6	Gastrulation brain homeobox 2
cell adhesion	8	SRY-box containing gene 6
others	174	Vimentin
EST	180	Dynein-like protein 2
<hr/>		A kinase (PRKA) anchor protein 2
total	428	Dynein light chain roadblock-type 2
		Kinesin 2
		Neurotrophin receptor associated death domain

**Fig. 36.**  
**Ontology analysis of genes showing increased expression in  
the white matter of rats at weaning exposed to anti-thyroid  
agents during the period from the mid-gestation to the end of  
lactation.**

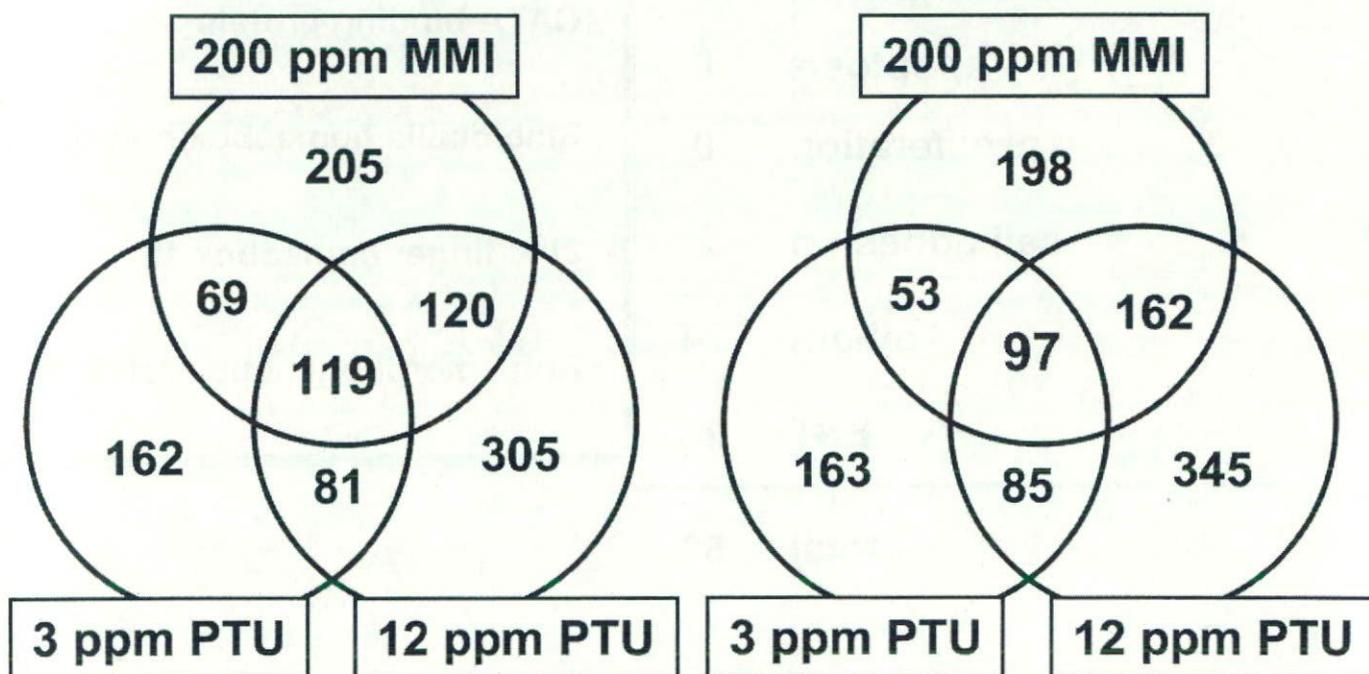
(central nervous system	neural	6	
development		5)	<b>example</b>
cell migration		0	GATA binding protein 3
apoptosis		0	Sine oculis homeobox homolog 1
proliferation		0	Zinc finger homeobox 1b
cell adhesion		2	Bone morphogenetic protein 6
others		24	
EST		26	
<b>total</b>		<b>58</b>	

**Fig. 37.**

**Ontology analysis of genes showing decreased expression in the white matter of rats at weaning exposed to anti-thyroid agents during the period from the mid-gestation to the end of lactation.**

Up-regulated ( $\geq 2$ -fold)

Down-regulated ( $\geq 1/2$ -fold)



**Fig. 38.**

Venn diagram of genes showing altered expression in the hippocampal CA1 region of rats at weaning exposed to anti-thyroid agents during the period from the mid-gestation to the end of lactation.

(central nervous system	neural	11	
development	7)		example
cell migration	1		Mindbomb homolog 1
apoptosis	4		Slit homolog 2
proliferation	1		Notch gene homolog 2
cell adhesion	2		Ephrin A5
others	49		Kinesin heavy chain family, member 2
EST	51		BH3 interacting domain
<hr/>			
	total	119	

**Fig. 39.**

Ontology analysis of genes showing increased expression in the hippocampal CA1 region of rats at weaning exposed to anti-thyroid agents during the period from the mid-gestation to the end of lactation.

		example
(central nervous system	neural 16	Endothelial differentiation, sphingolipid G-protein-coupled receptor, 8
development	15)	
cell migration	0	Eph receptor A7
apoptosis	4	Activating transcription factor 2
proliferation	0	Myelin-associated oligodendrocytic basic protein
cell adhesion	4	CCAAT/enhancer binding protein $\beta$
others	38	SRY-box containing gene 6
EST	35	Myelin oligodendrocyte glycoprotein
<hr/>		
	total 97	

**Fig. 40.**

Ontology analysis of genes showing decreased expression in the hippocampal CA1 region of rats at weaning exposed to anti-thyroid agents during the period from the mid-gestation to the end of lactation.

Up-regulated ( $\geq 2$ -fold)

Down-regulated ( $\geq 1/2$ -fold)

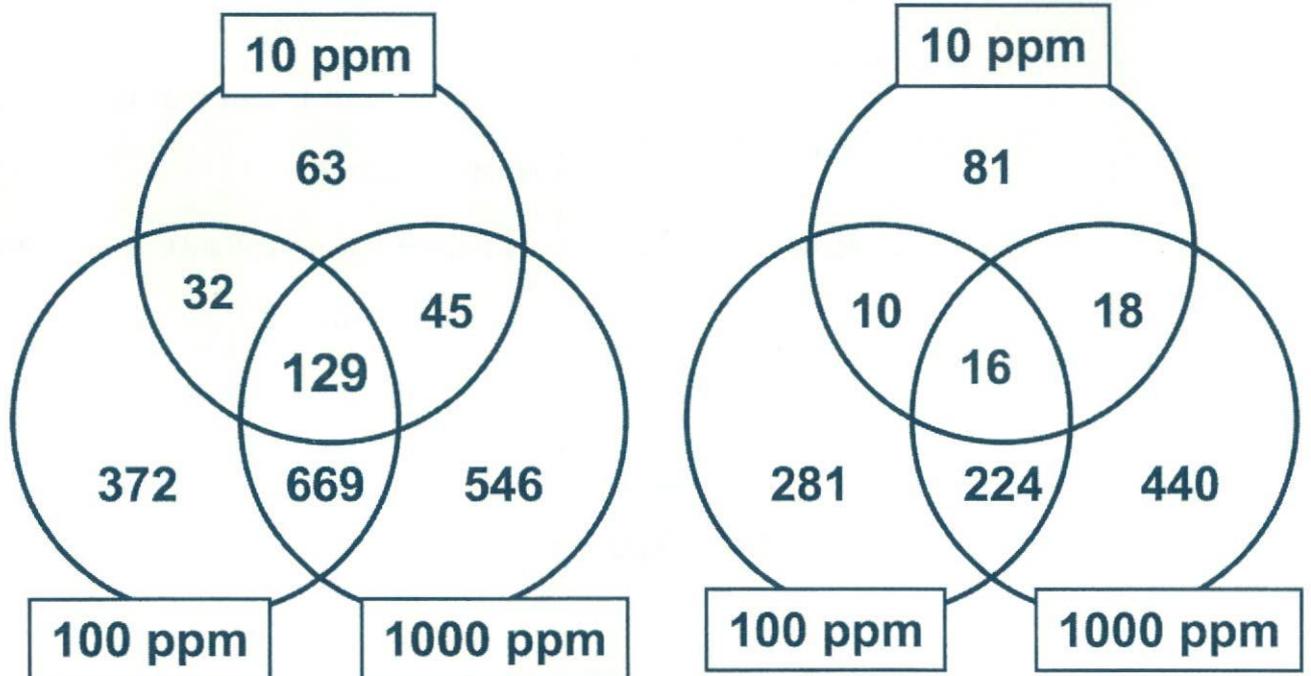


Fig. 41.

Venn diagram of genes showing altered expression in the white matter of rats at weaning exposed to decabromodiphenyl ether during the period from the mid-gestation to the end of lactation.

(central nervous system	neural	10	<p style="text-align: center;"><b>example</b></p> Deleted in colorectal carcinoma Hairy and enhancer of split 2 Gastrulation brain homeobox 2 Neuregulin 1 Suppressor of cytokine signaling 1 Follistatin-like 3 Bcl2-interacting killer Myc-like oncogene
development		6)	
cell migration		0	
apoptosis		2	
proliferation		1	
cell adhesion		3	
	others	30	
	EST	77	
	total	129	

**Fig. 42.**

Ontology analysis of genes showing increased expression in the white matter of rats at weaning exposed to decabromodiphenyl ether during the period from the mid-gestation to the end of lactation.