表7C
経口投与　マウス　1週間曝露で有意差を示した遺伝子リスト

Affymetrix No	GI No	Gene name	E/C 5hr	E/C 18hr	E/C 1w	E/C 2w
92600_f_at	AB018421	Mus musculus CYP4A10 mRNA for cytochrome P-450, complete cds.	7.66	6.96	17.32	8.20
102847_s_at	M19319	testosterone 15-alpha-hydroxylase; Mouse testosterone 15-alpha-hydroxylase mRNA type II, complete cds.	0.81	3.87	4.69	1.98
101909_f_at	M16357	major urinary protein III; Mouse major urinary protein III (MUP III) mRNA, partial cds.	2.08	10.80	3.82	2.07
101635_f_at	M16360	Mouse major urinary protein V (MUP V) mRNA, complete cds.	0.31	1.52	3.32	2.09
97682_r_at	J03953	glutathione transferase (EC 2.5.1.18); Mouse, glutathione transferase GT9.3 mRNA, 3' end.	1.30	3.32	3.02	1.50
101307_at	Y10221	M.musculus cyp4a12 gene, exons 10 & 11 (joined CDS).	0.85	0.90	2.59	0.97
97681_f_at	J03953	glutathione transferase (EC 2.5.1.18); Mouse, glutathione transferase GT9.3 mRNA, 3' end.	1.15	2.22	2.55	1.67
93842_at	AI196645	ui53d07.y1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1886125 5' similar to SW:DAP1_HUMAN P51397 DEATH-ASSOCIATED PROTEIN 1 ;, mRNA sequence.	1.08	0.93	2.32	0.98
92581_at	U07159	Mus musculus medium-chain acyl-CoA dehydrogenase (Acadm) mRNA, complete cds.	1.24	1.30	2.28	1.02
101887_at	AF045887	Mus musculus angiotensinogen precursor, gene, exon 5 and complete cds.	0.90	0.89	2.19	0.93
98582_at	U58988	2,5-dihydroxyphenylacetate oxidase; dioxygenase; Mus musculus homogentisate 1,2-dioxygenase (HGO) mRNA, complete cds.	0.76	0.76	2.06	0.85
100341_g_at	U95132	alternative transcript; Mus musculus Na/taurocholate cotransporting polypeptide 2 (Ntcp) mRNA, alternatively spliced, complete cds.	0.92	0.85	1.96	0.75
97449_at	AI835461	UI-M-AQ0-aag-a-06-0-UI.s1 NIH_BMAP_MHI Mus musculus cDNA clone UI-M-AQ0-aag-a-06-0-UI 3', mRNA sequence.	0.91	0.89	1.92	0.92
97450_s_at	AA986258	uc74b03.y1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1431341 5' similar to SW:DHAX_HUMAN P49419 ANTIQUITIN ;, mRNA sequence.	0.82	0.84	1.89	0.87
100041_at	AW124133	UI-M-BH2.1-apr-d-12-0-UI.s1 NIH_BMAP_M_S3.1 Mus musculus cDNA clone UI-M-BH2.1-apr-d-12-0-UI 3', mRNA sequence.	0.93	1.30	1.89	1.15
93496_at	AI852098	UI-M-BH0-aja-h-11-0-UI.s1 NIH_BMAP_M_S1 Mus musculus cDNA clone UI-M-BH0-aja-h-11-0-UI 3', mRNA sequence.	1.72	0.90	1.88	1.70
101531_at	AI527354	uj51b11.x1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1923453 3' similar to gb:X02747 FRUCTOSE-BISPHOSPHATE ALDOLASE B (HUMAN);, mRNA sequence.	1.15	1.68	1.85	1.05
94075_at	Y14660	Mus musculus mRNA for fatty acid binding protein (L-FABP).	0.72	0.66	1.83	0.94
101016_at	D87898	Mus musculus mRNA for ARF1, complete cds.	0.94	1.41	1.74	1.05
99583_at	X53451	glutathione S-transferase II (AA 1-210); Mouse mRNA for glutathione S-transferase II (EC 2.5.1.18).	0.29	0.62	1.61	1.31
96895_at	U32684	Mus musculus serum paraoxonase (Pon) mRNA, complete cds.	0.84	0.80	1.57	0.77
160194_at	U18992	Mus musculus glutaryl-CoA dehydrogenase mRNA, complete cds.	0.70	0.83	1.57	0.75
94056_at	M21285	stearoyl-CoA desaturase; Mouse stearoyl-CoA desaturase gene, exon 6.	0.77	0.86	1.47	1.28
94049_at	AF033381	Mus musculus betaine homocysteine methyl transferase (BHMT) mRNA, complete cds.	0.91	1.07	1.32	1.04
94057_g_at	M21285	stearoyl-CoA desaturase; Mouse stearoyl-CoA desaturase gene, exon 6.	0.74	0.83	0.73	1.03
98342_at	M93980	Mouse 24.6 kda protein mRNA, complete cds.	1.03	1.39	0.71	1.08
96092_at	M96827	C57BL/6J ob/ob haptoglobin mRNA, complete cds.	0.48	1.94	0.67	1.09

93278_at	M91458	Mus musculus sterol-carrier protein X mRNA, complete cds.	1.06	0.99	0.65	0.82
93543_f_at	J03952	glutathione transferase (EC 2.5.1.18); Mouse, glutathione transferase GT8.7 mRNA, complete	0.80	0.93	0.65	0.90
92800_i_at	AI836694	UI-M-AJ0-aax-a-08-0-UI.s1 NIH_BMAP_MOB Mus musculus cDNA clone UI-M-AJ0-aax-a-08-0-UI 3', mRNA sequence.	1.46	1.00	0.62	0.63
101287_s_at	M24264	testosterone 16-alpha-hydroxylase (CC); Mouse testosterone 16-alpha-hydroxylase (CC) gene, complete cds.	0.76	1.27	0.59	1.20
101565_f_at	M75720	Mus musculus alpha-1 protease inhibitor 3 (alpha-1 PI-3) mRNA, complete cds.	0.20	1.14	0.58	1.23
102109_at	U28917	member of L13E family of ribosomal proteins; similar to the 60S ribosomal protein L13 from rat, Swiss-Prot Accession Number P41123, human, Swiss-Prot Accession Number P26373, and chicken, Swiss-Prot Accession Number P41125; Mus musculus 60S ribosomal protein (A52) mRNA, complete cds.	1.14	1.70	0.55	1.29
160375_at	AJ006474	Mus musculus ca3 gene 5'UTR and exon 1.	0.84	0.61	0.54	0.79
95723_r_at	AI841464	UI-M-AH0-acy-a-04-0-UI.s1 NIH_BMAP_MCE Mus musculus cDNA clone UI-M-AH0-acy-a-04-0-UI 3', mRNA sequence.	0.85	1.32	0.49	1.12
93837_at	AI786089	uj58h09.y1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1924193 5' similar to gb:K02566 KININOGEN, LMW PRECURSOR (HUMAN);, mRNA sequence.	0.52	1.45	0.45	0.96
94777_at	X13060	Mouse serum albumin gene with LINE-1 repeat.	0.92	1.11	0.10	1.92

表7D
経口投与 マウス 2週間曝露で有意差を示した遺伝子リスト

Affymetrix No	GI No	Gene name	E/C 5hr	E/C 18hr	E/C 1w	E/C 2w
101103_at	Y11638	M.musculus CYP4A14 gene, exon 1-4 (and joined mRNA).	#VALUE!	14.23	#VALUE!	18.08
97316_at	AJ011864	Mus musculus mRNA for L-specific multifunctional beta-oxdiation protein, partial CDS.	4.93	5.16	10.01	9.30
92600_f_at	AB018421	Mus musculus CYP4A10 mRNA for cytochrome P-450, complete cds.	7.66	6.96	17.32	8.20
99559_at	U14390	Mus musculus aldehyde deydrogenase (Ahd3) mRNA, complete cds.	1.30	2.36	4.07	4.19
101682_f_at	M16358	Mouse major urinary protein IV (MUP IV) mRNA, complete cds.	1.15	1.08	1.14	3.66
95356_at	D00466	Mus musculus gene for apolipoprotein, exons 1,2,3,4, complete cds.	0.42	5.90	0.20	3.41
101515_at	AF006688	Mus musculus peroxisomal acyl-CoA oxidase (muspaox) mRNA, complete cds.	1.58	0.94	2.38	2.77
96792_at	AI787317	uj66c05.x1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1924904 3' similar to gb:X04506 APOLIPOPROTEIN B-100 PRECURSOR (HUMAN);, mRNA sequence.	1.09	1.06	1.36	2.54
101635_f_at	M16360	Mouse major urinary protein V (MUP V) mRNA, complete cds.	0.31	1.52	3.32	2.09
101909_f_at	M16357	major urinary protein III; Mouse major urinary protein III (MUP III) mRNA, partial cds.	2.08	10.80	3.82	2.07
93996_at	X01026	URF; Mouse mRNA fragment for repetitive element B2.	0.77	1.56	0.78	2.05
102004_at	AI530403	ui92f02.y1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1889883 5' similar to gb:X14813 3-KETOACYL-COA THIOLASE PEROXISOMAL PRECURSOR (HUMAN);, mRNA	1.39	1.25	2.95	2.01
102847_s_at	M19319	testosterone 15-alpha-hydroxylase; Mouse testosterone 15-alpha-hydroxylase mRNA type II, complete cds.	0.81	3.87	4.69	1.98
103689_at	AA833514	uc91f12.r1 Soares_NMPu Mus musculus cDNA clone IMAGE:1433039 5' similar to gb:X78338 MULTIDRUG RESISTANCE-ASSOCIATED PROTEIN (HUMAN);, mRNA sequence.	2.17	0.80	1.58	1.98
94777_at	X13060	Mouse serum albumin gene with LINE-1 repeat.	0.92	1.11	0.10	1.92
104007_at	AA986782	uc74c02.x1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1431362 3', mRNA sequence.	0.89	0.87	1.38	1.86
92539_at	M16465	calpactin I light chain; Mouse calpactin I light chain (p11) mRNA, complete cds.	1.96	3.32	1.38	1.85
96915_f_at	AA879764	vv98d04.r1 Soares_mammary_gland_NbMMG Mus musculus cDNA clone IMAGE:1230439 5' similar to SW:NI9M_BOVIN Q02371 NADH-UBIQUINONE OXIDOREDUCTASE B9 SUBUNIT ;, mRNA sequence.	0.80	1.18	1.11	1.78
95718_f_at	AW060158	UI-M-BH1-amu-b-10-0-UI.s1 NIH_BMAP_M_S2 Mus musculus cDNA clone UI-M-BH1-amu-b-10-0-UI 3', mRNA sequence.	0.84	1.36	1.18	1.75
97248_at	X61431	M.musculus mRNA for diazepam-binding inhibitor.	1.16	1.16	0.90	1.72
93496_at	AI852098	UI-M-BH0-aja-h-11-0-UI.s1 NIH_BMAP_M_S1 Mus musculus cDNA clone UI-M-BH0-aja-h-11-0-UI 3', mRNA sequence.	1.72	0.90	1.88	1.70
97680_at	M65237	Mouse murinoglobulin (MUG3) mRNA, last 2 exons.	1.00	2.18	0.92	1.68
97681_f_at	J03953	glutathione transferase (EC 2.5.1.18); Mouse, glutathione transferase GT9.3 mRNA, 3' end.	1.15	2.22	2.55	1.67
93512_f_at	AW121801	UI-M-BH2.3-anx-b-02-0-UI.s2 NIH_BMAP_M_S3.3 Mus musculus cDNA clone UI-M-BH2.3-anx-b-02-0-UI 3', mRNA sequence.	1.07	0.97	1.13	1.64
97515_at	X89998	M.musculus mRNA for 17 beta-hydroxysteroid dehydrogenase type IV.	0.90	1.20	1.45	1.64
100729_at	X80699	M.musculus L26 mRNA.	1.18	1.31	0.75	1.63
102998_at	X04283	cytochrome P2-450 (aa 1-513); Mouse mRNA for cytochrome P2-450.	0.50	0.97	1.10	1.56
94766_at	M17878	elongation factor Tu; Mouse eEF-Tu gene encoding elongation factor Tu, 5' end.	1.86	0.94	0.56	1.53
100564_at	AF068199	macrophage migration inhibitory factor homolog; Mus musculus D-dopachrome tautomerase gene, complete cds.	1.36	1.45	0.96	1.49

96134_at	AA755260	vp92b12.r1 Stratagene mouse diaphragm (#937303) Mus musculus cDNA clone IMAGE:1092191 5', mRNA sequence.	1.12	1.46	1.79	1.47
101638_s_at	D26137	Mouse cytochrome P450IIIA mRNA, complete cds.	0.86	1.48	0.99	1.44
99581_at	U60001	PKCI; similar to Bos taurus protein kinase C inhibitor 1, Swiss-Prot Accession Number P16436; HIT protein family member; Mus musculus protein kinase C inhibitor (mPKCI) mRNA, complete cds.	1.00	1.75	0.99	1.43
97887_at	Z22216	M.musculus APOC2 gene, complete CDS ,and exons 2 and 3.	1.08	1.24	0.88	1.39
95359_at	M18186	84 kD heat shock protein; Mouse 84 kD heat shock protein mRNA, complete cds.	0.76	0.96	1.20	1.38
160275_at	AI840996	UI-M-AM0-ado-d-06-0-UI.s1 NIH_BMAP_MAM Mus musculus cDNA clone UI-M-AM0-ado-d-06-0-UI 3', mRNA sequence.	0.80	1.26	1.10	1.36
96326_at	AI255353	ui92h11.x1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1889925 3', mRNA sequence.	0.74	1.22	1.09	1.34
100329_at	X00945	protease inhibitor; Mouse alpha1-protease inhibitor gene fragment (alpha 1-PI; alpha1-antitrypsin).	0.55	1.23	0.78	1.32
99571_at	AW012588	ul69g10.x1 Sugano mouse kidney mkia Mus musculus cDNA clone IMAGE:2135874 3' similar to gb:X14813 3-KETOACYL-COA THIOLASE PEROXISOMAL PRECURSOR (HUMAN);, mRNA	1.02	1.29	1.10	1.32
99583_at	X53451	glutathione S-transferase II (AA 1-210); Mouse mRNA for glutathione S-transferase II (EC 2.5.1.18).	0.29	0.62	1.61	1.31
94056_at	M21285	stearoyl-CoA desaturase; Mouse stearoyl-CoA desaturase gene, exon 6.	0.77	0.86	1.47	1.28
100538_at	M35725	Cu-Zn superoxide dismutase (EC 1.15.11); Mouse Cu-Zn superoxide dismutase mRNA, complete cds.	1.13	1.19	0.82	1.28
101898_s_at	X16426	unnamed protein product; Mouse MHC (Qa) Q10-k gene for class I antigen.	0.88	1.06	0.84	1.25
101565_f_at	M75720	Mus musculus alpha-1 protease inhibitor 3 (alpha-1 PI-3) mRNA, complete cds.	0.20	1.14	0.58	1.23
96608_at	AF023463	Refsum disease gene; PTS2-targeted peroxisomal matrix protein; Mus musculus peroxisomal phytanoyl-CoA alpha-hydroxylase (PAHX) mRNA, complete cds.	0.80	1.24	0.87	1.23
98116_at	U89889	serum protein; Mus musculus hemopexin mRNA, partial cds.	0.52	1.16	1.00	1.22
101287_s_at	M24264	testosterone 16-alpha-hydroxylase (CC); Mouse testosterone 16-alpha-hydroxylase (CC) gene, complete cds.	0.76	1.27	0.59	1.20
93045_at	L28836	Mus musculus peroxisome membrane protein (PMP70) gene, complete cds.	0.72	0.77	1.33	1.19
161626_f_at	AV028204	AV028204 Mus musculus adult C57BL/6J liver Mus musculus cDNA clone 1300018L03, mRNA sequence.	0.81	1.10	0.88	1.13
99862_at	AF025821	fetuin; insulin receptor tyrosine kinase inhibitor/binding protein for hydroxylapatite; simlar to fetuin homolog encoded by GenBank Accession Number S96534; Mus musculus alpha 2-Heremans-Schmid-glycoprotein (Ahsg) gene, exons 2, 3, and 4, and partial cds.	0.78	0.99	1.04	0.83
96828_at	D89664	Mus musculus mRNA for glycine N-methyltransferase, complete cds.	1.05	0.99	0.92	0.81
97867_at	X83202	M.musculus mRNA for 11beta-hydroxysteroid dehydrogenase/carbonyl reductase.	0.82	0.93	1.12	0.80
160375_at	AJ006474	Mus musculus ca3 gene 5'UTR and exon 1.	0.84	0.61	0.54	0.79
96895_at	U32684	Mus musculus serum paraoxonase (Pon) mRNA, complete cds.	0.84	0.80	1.57	0.77
161815_f_at	AV355798	AV355798 RIKEN full-length enriched, adult male adrenal gland Mus musculus cDNA clone 7330417P17 3' similar to M28649 Mouse major urinary protein mRNA, mRNA sequence.	0.87	0.96	0.92	0.77
98549_at	M77123	Mouse vitronectin mRNA, complete cds.	1.11	0.90	1.21	0.76
160194_at	U18992	Mus musculus glutaryl-CoA dehydrogenase mRNA, complete cds.	0.70	0.83	1.57	0.75
100341_g_at	U95132	alternative transcript; Mus musculus Na/taurocholate cotransporting polypeptide 2 (Ntcp) mRNA, alternatively spliced, complete cds.	0.92	0.85	1.96	0.75
104519_at	X70392	M.musculus mRNA for inter-alpha-inhibitor H2 chain.	0.97	0.79	0.95	0.75
101899_at	X52308	protein precursor (AA -43 to 575); Mouse mRNA for prothrombin.	1.10	0.78	0.98	0.71

93770_at	X60452	M.musculus mRNA for cytochrome P-450IIIA.	0.85	1.01	0.87	0.69
95043_at	AI047331	ud65a02.y1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1450730 5' similar to gb:M61853 CYTOCHROME P450 IIC18 (HUMAN); gb:D17674 Mouse mRNA for cytochrome P-450, complete cds (MOUSE);, mRNA sequence.	0.90	0.66	1.06	0.69
101928_at	Z36774	M.musculus mRNA for alpha-2 antiplasmin.	0.88	0.48	1.08	0.68
97420_at	AW230891	uo69b04.y1 NCI_CGAP_Mam1 Mus musculus cDNA clone IMAGE:2647759 5' similar to SW:A2GL_HUMAN P02750 LEUCINE-RICH ALPHA-2-GLYCOPROTEIN ;, mRNA sequence.	1.05	0.94	0.94	0.67
96025_g_at	L32836	copper binding protein; Mus musculus (clone C7/B9) S-adenosyl homocysteine hydrolase (ahcy) mRNA, complete cds.	0.96	0.84	0.82	0.66
100002_at	X70393	M.musculus mRNA for inter-alpha-inhibitor H3 chain.	1.00	0.75	0.84	0.66
103333_at	U00445	Mus musculus glucose-6-phosphatase mRNA, complete cds.	0.72	0.67	1.07	0.65
103033_at	X06454	Slp(w7); Mouse mRNA for sex-limited protein Slp(w7) alpha-gamma chain.	0.99	0.57	0.84	0.65
92800_i_at	AI836694	UI-M-AJ0-aax-a-08-0-UI.s1 NIH_BMAP_MOB Mus musculus cDNA clone UI-M-AJ0-aax-a-08-0-UI 3', mRNA sequence.	1.46	1.00	0.62	0.63
96764_at	AJ007971	Mus musculus mRNA for IIGP protein.	1.11	0.63	0.65	0.62
AFFX-b-Actin	M12481	cytoplasmic beta-actin; Mouse cytoplasmic beta-actin mRNA.	0.92	1.55	1.08	0.62
102096_f_at	AI255271	ui89h12.x1 Sugano mouse liver mlia Mus musculus cDNA clone IMAGE:1889639 3' similar to gb:M28649 Mouse major urinary protein mRNA, complete cds (MOUSE);, mRNA sequence.	0.67	0.83	0.79	0.62
161563_r_at	AV266785	AV266785 RIKEN full-length enriched, adult male testis (DH10B) Mus musculus cDNA clone 4930520I22 3', mRNA sequence.	0.37	1.01	0.88	0.61
103407_at	AA895838	vy34g05.r1 Stratagene mouse lung 937302 Mus musculus cDNA clone IMAGE:1297400 5' similar to gb:M73700 LACTOTRANSFERRIN PRECURSOR (HUMAN); gb:J03298 Mouse uterine lactotransferrin mRNA (MOUSE);, mRNA sequence.	1.10	0.50	0.87	0.61
160253_at	AW125390	UI-M-BH2.3-aqh-c-06-0-UI.s1 NIH_BMAP_M_S3.3 Mus musculus cDNA clone UI-M-BH2.3-aqh-c-06-0-UI 3', mRNA sequence.	1.22	0.84	0.68	0.61
103284_at	AF090317	cytochrome P450; Mus musculus sterol 12-alpha hydroxylase CYP8B1 (Cyp8b1) mRNA, complete	0.92	1.09	1.52	0.60
99083_at	AF047542	drug metabolizing enzyme; CYP2C37; Mus musculus cytochrome P450 (Cyp2c37) mRNA, complete	0.89	0.60	1.33	0.60
161913_r_at	AV378014	AV378014 RIKEN full-length enriched, adult male cecum Mus musculus cDNA clone 9130409H12 3' similar to J03941 Mouse ferritin heavy chain (MFH) mRNA, mRNA sequence.	0.95	0.85	1.01	0.59
104424_at	X05475	C9 protein; Mouse mRNA fragment for complement component C9.	0.89	0.92	0.60	0.58
94795_at	L41519	3-beta-hydroxysteroid dehydrogenase; 3-hydroxysteroid; ketosteroid; multigene family; Mus musculus 3-ketosteroid reductase (HSD3b5) mRNA, complete cds.	0.69	0.71	0.50	0.56
93277_at	X53584	HSP60 protein (555 AA); Mouse mRNA for HSP60 protein (clones 3T3-7, -9, and -M1).	1.90	1.22	1.18	0.54
104658_at	D17444	Mouse mRNA for soluble D-factor/LIF receptor, complete cds.	0.62	0.35	0.53	0.51
100436_at	M27008	Mouse alpha-1 acid glycoprotein (Agp-1B) mRNA, complete cds.	1.37	0.96	0.73	0.48
93974_at	AW212475	uo89c05.x1 NCI_CGAP_Mam3 Mus musculus cDNA clone IMAGE:2649704 3', mRNA sequence.	0.84	1.14	2.72	0.46
92848_at	X64837	M.musculus Oat mRNA for ornithine aminotransferase.	0.89	0.47	1.73	0.40
101179_at	D50494	translocation break point; Mouse mRNA for murine RCK, complete cds.	1.00	1.21	1.06	0.24
AFFX-18SRN	X00686	Mouse gene for 18S rRNA.	0.51	0.60	3.24	0.23
103465_f_at	U60438	Mus musculus serum amyloid A protein isoform 2 mRNA, complete cds.	0.89	1.48	0.62	0.13

表8A
経口投与 ラット 曝露後5時間で有意差を示した遺伝子リスト

Affymetrix No	GI No	Gene name	E/C 5hr	E/C 18hr	E/C 1w	E/C 2w
rc_AA799616_at	AA799616	EST189113 Normalized rat heart, Bento Soares Rattus sp. cDNA clone RHEAD20 3' end, mRNA sequence.	2.83	0.80	0.92	1.06
rc_AI010292_s_at	AI010292	EST204743 Normalized rat lung, Bento Soares Rattus sp. cDNA clone RLUBW56 3' end, mRNA sequence.	0.72	0.70	1.66	1.84
M81397_at	M81397	Rattus norvegicus thrombin mRNA, 3' end.	0.72	1.00	1.16	0.87
AF082834_s_at	AF082834	Rattus norvegicus 4-hydroxyphenylpyruvate dioxygenase (HPPD) mRNA, complete cds.	0.71	1.00	1.15	0.87
X57529cds_s_at	X57529	R.rattus ribosomal protein S18 mRNA.	0.71	1.29	1.27	0.91
M33648_g_at	M33648	3-hydroxy-3-methylglutaryl-CoA synthase precursor (EC 4.1.3.5); Rat mitochondrial 3-hydroxy-3-methylglutaryl-CoA synthase mRNA, complete cds.	0.70	1.06	1.07	1.09
AF056333_s_at	AF056333	Rattus norvegicus cytochrome P450 2E1 (CYP2E1) mRNA, partial cds.	0.69	1.09	1.21	0.85
M21060_s_at	M21060	Cu-Zn superoxide dismutase (EC 1.15.1.1); Rat copper-zinc containing superoxide dismutase mRNA, complete cds.	0.69	1.30	1.14	0.93
rc_AI007824_at	AI007824	EST202275 Normalized rat brain, Bento Soares Rattus sp. cDNA clone RBRAV39 3' end, mRNA sequence.	0.69	0.86	1.43	1.24
J02869mRNA_s_a	J02869	cytochrome P-450 IID5; Rat cytochrome P-450 IID5 mRNA, complete cds.	0.68	1.36	1.23	0.86
S87544_g_at	S87544	This sequence comes from Fig 1; polyprotein 1-microglobulin/bikunin [rats, liver, mRNA, 1162	0.68	1.19	1.02	0.88
rc_AI169372_g_at	AI169372	EST215216 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIBR42 3' end, mRNA sequence.	0.68	1.14	0.89	0.82
M14775_s_at	M14775	Rat cytochrome P-450 polypeptide mRNA, partial cds.	0.67	1.32	1.07	0.87
J02592_s_at	J02592	glutathione S-transferase Y-b subunit (EC 2.5.1.18); Rat glutathione S-transferase Y-b subunit mRNA, 3' end.	0.67	1.27	1.15	0.85
J02597cds_s_at	J02597	preapolipoprotein A-I; Rat apolipoprotein A-I gene, complete cds.	0.67	1.47	1.21	0.81
rc_AA945585_at	AA945585	EST201084 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAP37 3' end, mRNA sequence.	0.67	1.10	1.10	0.96
X15096cds_s_at	X15096	ribosomal phosphoprotein P0 (AA 1-316); Rat mRNA for acidic ribosomal phosphoprotein P0.	0.67	1.46	1.26	0.95
X83231_at	X83231	R.norvegicus mRNA for pre-alpha-inhibitor, heavy chain 3.	0.66	1.18	1.16	0.83
S48325_s_at	S48325	This sequence comes from Fig. 2; RLM6; diabetes-inducible cytochrome P450RLM6 [rats, liver, mRNA Partial, 1093 nt].	0.66	1.55	1.09	0.57
V01235_at	V01235	binding protein; Rat mRNA encoding liver fatty acid binding protein.	0.64	1.32	1.15	0.95
rc_AA893237_at	AA893237	EST197040 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIBD90 3' end, mRNA sequence.	0.64	1.51	1.15	0.81
U11071_f_at	U11071	Rattus norvegicus Sprague-Dawley polyadenylate-binding protein-related protein mRNA, 3'	0.63	0.58	0.32	0.76
M29866_s_at	M29866	complement component C3; Rat complement component C3 mRNA, partial cds.	0.63	1.26	1.21	0.63
rc_AA945143_at	AA945143	EST200642 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAH13 3' end, mRNA sequence.	0.63	0.66	1.57	1.10
M28255_s_at	M28255	Rattus norvegicus cytochrome c oxidase subunit VIII (COVIII) mRNA, partial cds.	0.63	1.31	1.41	0.77
X04229cds_s_at	X04229	GST Y(b) subunit (aa 1-218); Rat mRNA for glutathione S-transferase (GST) Y(b) subunit (EC 2.5.1.18).	0.63	1.42	1.06	0.72

K03045cds_s_at	K03045	Rat retinol-binding protein (RBP) gene, exon 5.	0.62	1.53	1.18	0.81
X12459_at	X12459	argininosuccinate synthetase (AA 1-412); Rat mRNA for argininosuccinate synthetase (EC	0.62	1.14	1.23	0.87
M15327_at	M15327	alcohol dehydrogenase; Rat alcohol dehydrogenase (ADH) mRNA, complete cds.	0.62	1.63	1.17	0.71
K02814_at	K02814	Rat mRNA for major acute phase alpha-1 protein (MAP).	0.62	1.29	1.31	1.09
M12337_at	M12337	phenylalanine hydroxylase (EC 1.14.16.1); Rat phenylalanine hydroxylase mRNA, complete cds.	0.62	0.56	1.11	0.92
K02814_g_at	K02814	Rat mRNA for major acute phase alpha-1 protein (MAP).	0.61	1.23	1.18	1.09
X57432cds_s_at	X57432	R.rattus mRNA for ribosomal protein S2.	0.61	1.41	1.26	1.05
H32189_s_at	H32189	EST107045 Rat PC-12 cells, untreated Rattus sp. cDNA clone RPCBK23 5' end similar to Glutathione S-transferase, mRNA sequence.	0.61	1.27	0.97	0.64
U47315_s_at	U47315	RNU47315 Rat R2 cerebellum DDRT-T-PCR Rattus norvegicus cDNA clone LIAREST-1, mRNA sequence.	0.60	1.50	1.28	0.78
rc_AA945128_at	AA945128	EST200627 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAG85 3' end, mRNA sequence.	0.60	1.00	0.87	1.10
rc_AA942685_at	AA942685	EST198184 Normalized rat brain, Bento Soares Rattus sp. cDNA clone RBRAA17 3' end, mRNA sequence.	0.60	1.21	1.18	0.83
rc_AA894200_g_at	AA894200	EST198003 Normalized rat spleen, Bento Soares Rattus sp. cDNA clone RSPAS59 3' end, mRNA sequence.	0.60	1.42	1.24	0.97
K03243mRNA_s_a	K03243	Rattus norvegicus phosphoenolpyruvate carboxykinase (GTP) gene, exons 1, 2, and 3.	0.60	0.71	0.80	0.78
rc_AI178207_at	AI178207	EST221872 Normalized rat placenta, Bento Soares Rattus sp. cDNA clone RPLCN51 3' end,	0.59	1.68	1.37	0.86
X02284_at	X02284	R.norvegicus gene encoding aldolase B, exon 2, and joined CDS.	0.59	1.11	1.11	0.89
rc_AI105448_at	AI105448	EST214737 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIBK51 3' end, mRNA sequence.	0.59	1.53	1.18	0.91
rc_AA945169_g_at	AA945169	EST200668 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAH44 3' end, mRNA sequence.	0.59	1.42	1.14	0.86
X02291exon_s_at	X02291	R.norvegicus gene encoding aldolase B, exon 9.	0.58	1.45	0.99	0.74
rc_AA800797_at	AA800797	EST190294 Normalized rat lung, Bento Soares Rattus sp. cDNA clone RLUAL56 3' end, mRNA sequence.	0.57	0.93	0.94	1.02
rc_AA893485_g_at	AA893485	EST197288 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAD06 3' end, mRNA sequence.	0.57	1.31	1.47	0.82
rc_AA965264_at	AA965264	UI-R-C0-hd-b-11-0-UI.s1 UI-R-C0 Rattus norvegicus cDNA clone UI-R-C0-hd-b-11-0-UI 3', mRNA sequence.	0.57	1.59	0.93	0.73
L14004UTR#1_s_a t	L14004	Rattus norvegicus polymeric immunoglobulin receptor AATTAA-containing 3'UTR Group 1 mRNA sequence.	0.57	1.60	1.19	0.75
AB008423_s_at	AB008423	CYP2D cytochrome P450 isoform; Rattus norvegicus mRNA for CYP2D2, complete cds.	0.56	1.45	1.22	0.81
M24239cds#2_f_at	M24239	product of unknown function; Rat cytochrome P450-1/PB-(ps) gene, exon 9.	0.56	1.38	1.04	0.77
M62642_at	M62642	Rat (clone pRHx1) hemopexin mRNA, complete cds.	0.56	1.76	1.52	0.83
rc_AA945152_s_at	AA945152	EST200651 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAH24 3' end, mRNA sequence.	0.54	1.12	0.99	0.80
rc_AA800318_at	AA800318	EST189815 Normalized rat heart, Bento Soares Rattus sp. cDNA clone RHEAN84 3' end, mRNA sequence.	0.52	1.26	1.02	0.68
rc_AI236795_s_at	AI236795	EST233357 Normalized rat ovary, Bento Soares Rattus sp. cDNA clone ROVDK61 3' end, mRNA sequence.	0.51	1.45	1.29	0.72

X16273cds_g_at	X16273	Rat mRNA for serine proteinase inhibitor-like protein, partial.	0.51	2.44	1.10	0.90
U44845_at	U44845	S-protein; epibolin; serum spreading factor; found in endothelial cell matrix, necrotic tissues; adhesion protein; Rattus norvegicus vitronectin mRNA, complete cds.	0.48	1.62	1.35	0.87
J02596cds_g_at	J02596	preapolipoprotein C-III; Rat apolipoprotein C-III gene, complete cds.	0.46	1.97	1.14	0.88
rc_AA800849_f_at	AA800849	EST190346 Normalized rat lung, Bento Soares Rattus sp. cDNA 3' end, mRNA sequence.	0.44	1.20	0.83	1.23
J05425cds_s_at	J05425	cytochrome c oxidase; Rat cytochrome c oxidase subunit IV (COXIV) gene, complete cds.	0.43	2.12	1.82	0.61
K03045cds_r_at	K03045	Rat retinol-binding protein (RBP) gene, exon 5.	0.43	0.38	1.92	0.92
J03524_s_at	J03524	alpha-1 inhibitor III; Rat alpha-1 inhibitor III mRNA, partial cds.	0.39	2.60	1.24	0.89
J02810mRNA_s_at	J02810	glutathione S-transferase Yb-1 subunit; Rat prostate glutathione S-transferase mRNA, complete cds.	0.38	1.89	1.15	0.54
rc_AI172293_at	AI172293	EST218294 Normalized rat muscle, Bento Soares Rattus sp. cDNA clone RMUBX42 3' end,	0.35	0.49	0.54	0.91
X16273cds_at	X16273	Rat mRNA for serine proteinase inhibitor-like protein, partial.	0.35	2.31	1.34	0.90
S87544_at	S87544	This sequence comes from Fig 1; polyprotein 1-microglobulin/bikunin [rats, liver, mRNA, 1162	0.32	2.24	2.41	0.53
D10261_g_at	D10261	Rattus norvegicus mRNA for 59-kDa bone sialic acid-containing protein, complete cds.	0.29	5.84	4.34	0.76
rc_AA817964_s_at	AA817964	UI-R-A0-ag-g-03-0-UI.s1 UI-R-A0 Rattus norvegicus cDNA clone UI-R-A0-ag-g-03-0-UI 3' similar to gb|U32684|MMU32684 Mus musculus serum paraoxonase (Pon) mRNA, complete cds, mRNA sequence.	0.20	2.42	1.66	0.74
S76779_s_at	S76779	apolipoprotein E, ApoE; This sequence comes from Fig. 1; ApoE; rApoE=apolipoprotein E [rats, liver, mRNA Partial, 951 nt].	0.11	4.14	2.82	0.55
rc_AI179150_s_at	AI179150	EST222834 Normalized rat spleen, Bento Soares Rattus sp. cDNA clone RSPCC55 3' end,	0.00	#DIV/0!	70.08	0.00

表8B

経口投与 ラット 曝露後18時間で有意差を示した遺伝子リスト

Affymetrix No	GI No	Gene name	E/C 5hr	E/C 18hr	E/C 1w	E/C 2w
rc_AI179150_s_at	AI179150	EST222834 Normalized rat spleen, Bento Soares Rattus sp. cDNA clone RSPCC55 3' end, mRNA sequence.	0.00	#DIV/0!	70.08	0.00
rc_AA860062_g_at	AA860062	UI-R-E0-bz-h-06-0-UI.s2 UI-R-E0 Rattus norvegicus cDNA clone UI-R-E0-bz-h-06-0-UI 3' similar to emb|V01222|RNALBU Messenger RNA for rat preproalbumin gi|202823|gb|J00698|RATALBM Rat serum albumin mRNA, mRNA sequence.	0.00	10654.00	180.09	0.40
D38380_g_at	D38380	Rattus norvegicus mRNA for transferrin, complete cds.	0.00	76.66	10.42	0.06
J02596cds_at	J02596	preapolipoprotein C-III; Rat apolipoprotein C-III gene, complete cds.	0.54	16.88	1.73	2.13
U02506UTR#1_s_at	U02506	Rattus norvegicus clone 7 polymeric immunoglobulin receptor mRNA, 3' untranslated region microsatellite repeats.	0.15	15.60	4.66	0.44
rc_AA945321_at	AA945321	EST200820 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAK73 3' end, mRNA sequence.	0.17	13.33	1.28	0.36
rc_AA866237_s_at	AA866237	UI-R-A0-bg-f-12-0-UI.s1 UI-R-A0 Rattus norvegicus cDNA clone UI-R-A0-bg-f-12-0-UI 3' similar to emb|V01222|RNALBU Messenger RNA for rat preproalbumin gi|202823|gb|J00698|RATALBM Rat serum albumin mRNA, mRNA sequence.	0.52	5.90	1.26	0.47
D10261_g_at	D10261	Rattus norvegicus mRNA for 59-kDa bone sialic acid-containing protein, complete cds.	0.29	5.84	4.34	0.76
rc_AI010453_at	AI010453	EST204904 Normalized rat lung, Bento Soares Rattus sp. cDNA clone RLUBZ64 3' end, mRNA sequence.	0.19	5.54	4.82	0.65
AF045464_s_at	AF045464	Rattus norvegicus aflatoxin B1 aldehyde reductase (AFAR) mRNA, complete cds.	1.43	4.35	2.04	2.68
S76779_s_at	S76779	apolipoprotein E, ApoE; This sequence comes from Fig. 1; ApoE; rApoE=apolipoprotein E [rats, liver, mRNA Partial, 951 nt].	0.11	4.14	2.82	0.55
K01933_at	K01933	preprohaptoglobin; Rat haptoglobin mRNA, partial alpha-, complete beta-subunit and 3' flank.	0.20	3.51	7.24	0.63
rc_AI176460_s_at	AI176460	EST220045 Normalized rat ovary, Bento Soares Rattus sp. cDNA clone ROVBS08 3' end, mRNA sequence.	0.45	3.47	1.29	0.62
M27434_s_at	M27434	Rat alpha-2-u globulin mRNA.	0.28	3.40	2.41	0.33
AF001898_at	AF001898	constitutively expressed cytosolic protein; Rattus norvegicus aldehyde dehydrogenase (ALDH) mRNA, complete cds.	1.09	3.25	3.39	7.13
K00996mRNA_s_at	K00996	cytochrome p-450e; Rat cytochrome p-450e (phenobarbital-induced) mRNA, 3' end.	2.21	3.23	1.99	3.02
X03468_at	X03468	pre-pro-apolipoprotein (-23 to 79); Rat mRNA for apolipoprotein apoA-II.	0.59	3.06	1.22	0.77
J00728cds_f_at	J00728	cytochrome P-450; Rat cytochrome P-450e (phenobarbital-inducible) gene, exon 9.	2.07	2.95	2.12	2.71
M13234cds_f_at	M13234	cyt P-450 (AA at 72); Rat cytochrome P-450e gene, exons 7 and 8.	2.20	2.82	1.71	2.33
J02657_s_at	J02657	cytochrome P-450(M-1); Rat cytochrome P-450(M-1) mRNA, complete cds.	0.64	2.73	1.62	0.66
J03524_s_at	J03524	alpha-1 inhibitor III; Rat alpha-1 inhibitor III mRNA, partial cds.	0.39	2.60	1.24	0.89
rc_AA945169_at	AA945169	EST200668 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAH44 3' end, mRNA sequence.	0.64	2.60	1.20	0.84
K01721mRNA_s_at	K01721	cytochrome P-450(1); Rat P-450(1) variant (phenobarbital-inducible) cytochrome 3' end, flank.	1.34	2.45	1.08	2.15
X16273cds_g_at	X16273	Rat mRNA for serine proteinase inhibitor-like protein, partial.	0.51	2.44	1.10	0.90
rc_AA817964_s_at	AA817964	UI-R-A0-ag-g-03-0-UI.s1 UI-R-A0 Rattus norvegicus cDNA clone UI-R-A0-ag-g-03-0-UI 3' similar to gb|U32684|MMU32684 Mus musculus serum paraoxonase (Pon) mRNA, complete cds, mRNA sequence.	0.20	2.42	1.66	0.74

X59051cds_s_at	X59051	R.norvegicus gene for ribosomal protein S29.	0.56	2.35	1.45	0.75
X16273cds_at	X16273	Rat mRNA for serine proteinase inhibitor-like protein, partial.	0.35	2.31	1.34	0.90
rc_AA892888_at	AA892888	EST196691 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIAY54 3' end, mRNA sequence.	0.87	2.30	1.24	1.06
J03959_at	J03959	uricase precursor (E.C. 1.7.3.3); Rat uricase mRNA, 3' end.	0.52	2.25	1.71	0.79
S87544_at	S87544	This sequence comes from Fig 1; polyprotein 1-microglobulin/bikunin [rats, liver, mRNA, 1162	0.32	2.24	2.41	0.53
D13127_at	D13127	Rattus norvegicus mRNA for oligomycin sensitivity conferring protein, complete cds.	0.51	2.22	1.51	0.71
M33648_at	M33648	3-hydroxy-3-methylglutaryl-CoA synthase precursor (EC 4.1.3.5); Rat mitochondrial 3-hydroxy-3-methylglutaryl-CoA synthase mRNA, complete cds.	0.64	2.21	1.13	0.50
rc_AA892333_at	AA892333	EST196136 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIAP19 3' end, mRNA sequence.	0.83	2.19	1.39	1.47
J05425cds_s_at	J05425	cytochrome c oxidase; Rat cytochrome c oxidase subunit IV (COXIV) gene, complete cds.	0.43	2.12	1.82	0.61
M60753_s_at	M60753	R.norvegicus catechol-O-methyltransferase mRNA, complete cds.	0.71	2.08	1.32	0.70
J02596cds_g_at	J02596	preapolipoprotein C-III; Rat apolipoprotein C-III gene, complete cds.	0.46	1.97	1.14	0.88
X15512_at	X15512	Rat mRNA for apolipoprotein CI.	0.37	1.93	2.20	0.73
rc_AA818226_s_at	AA818226	UI-R-A0-ah-g-06-0-UI.s1 UI-R-A0 Rattus norvegicus cDNA clone UI-R-A0-ah-g-06-0-UI 3' similar to emb|X14209|RNCOXIV Rat mRNA for cytochrome c oxidase subunit IV, mRNA	0.53	1.92	1.76	0.66
J02810mRNA_s_at	J02810	glutathione S-transferase Yb-1 subunit; Rat prostate glutathione S-transferase mRNA, complete cds.	0.38	1.89	1.15	0.54
M26125_at	M26125	epoxide hydrolase; Rat epoxide hydrolase mRNA, complete cds.	0.70	1.89	1.30	1.53
M00001_i_at	M00001	preproapolipoprotein A-I; Rat apolipoprotein A-I (apoA-I) mRNA, complete cds.	0.80	1.88	1.38	0.82
M93257_s_at	M93257	Rattus norvegicus cathechol-O-methyltransferase mRNA, 3' flank.	0.72	1.87	1.21	1.01
X53378cds_s_at	X53378	ribosomal protein S13; Rat mRNA for ribosomal protein S13.	0.74	1.82	1.48	0.96
M62642_at	M62642	Rat (clone pRHx1) hemopexin mRNA, complete cds.	0.56	1.76	1.52	0.83
rc_AA818069_f_at	AA818069	UI-R-A0-ag-b-03-0-UI.s2 UI-R-A0 Rattus norvegicus cDNA clone UI-R-A0-ag-b-03-0-UI 3' similar to dbj|D16554|RATPOLYU Rat mRNA for polyubiquitin (four repetitive ubiquitins in tandem), complete cds, mRNA sequence.	0.60	1.76	1.00	1.01
J01435cds#8_s_at	J01435		0.51	1.72	1.18	0.60
rc_AI178207_at	AI178207	EST221872 Normalized rat placenta, Bento Soares Rattus sp. cDNA clone RPLCN51 3' end, mRNA sequence.	0.59	1.68	1.37	0.86
rc_AI178750_at	AI178750	EST222432 Normalized rat spleen, Bento Soares Rattus sp. cDNA clone RSPBK62 3' end, mRNA sequence.	0.89	1.68	1.26	0.92
D25224_at	D25224	Rat mRNA for 40kDa ribosomal protein, complete cds.	0.76	1.67	1.27	0.89
Z36980_at	Z36980	R.norvegicus mRNA for D-dopachrome tautomerase.	0.85	1.66	1.28	1.06
rc_AA892395_s_at	AA892395	EST196198 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIAP91 3' end, mRNA sequence.	0.71	1.65	1.20	0.77
M15327_at	M15327	alcohol dehydrogenase; Rat alcohol dehydrogenase (ADH) mRNA, complete cds.	0.62	1.63	1.17	0.71
J03588_at	J03588	guanidinoacetate methyltransferase precursor; Rat guanidinoacetate methyltransferase mRNA, complete cds.	0.74	1.63	1.13	0.77
U44845_at	U44845	S-protein; epibolin; serum spreading factor; found in endothelial cell matrix, necrotic tissues; adhesion protein; Rattus norvegicus vitronectin mRNA, complete cds.	0.48	1.62	1.35	0.87
M12450_at	M12450	vitamin D binding protein prepeptide; Rat vitamin D binding protein (DBP) mRNA, complete cds.	0.67	1.60	1.26	0.79
M11071_f_at	M11071	MHC antigen; Rat MHC class I cell surface antigen mRNA.	0.72	1.60	0.61	0.87

M20629_s_at	M20629	carboxylesterase precursor (EC 3.1.1.1); Rat liver carboxylesterase.	0.69	1.60	1.20	0.94
L14004UTR#1_s_at	L14004	Rattus norvegicus polymeric immunoglobulin receptor AATTAA-containing 3'UTR Group 1 mRNA sequence.	0.57	1.60	1.19	0.75
rc_AA965264_at	AA965264	UI-R-C0-hd-b-11-0-UI.s1 UI-R-C0 Rattus norvegicus cDNA clone UI-R-C0-hd-b-11-0-UI 3', mRNA sequence.	0.57	1.59	0.93	0.73
rc_AA893280_at	AA893280	EST197083 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIBE43 3' end, mRNA sequence.	0.81	1.59	1.27	1.07
rc_AI228674_s_at	AI228674	EST225369 Normalized rat brain, Bento Soares Rattus sp. cDNA clone RBRCX94 3' end, mRNA sequence.	0.69	1.56	1.12	0.79
M20406_at	M20406	cytochrome P450IIB3; Rat cytochrome P450IIB3 (P450IIB subfamily) mRNA, complete cds.	0.60	1.56	1.22	0.78
X56228_at	X56228	Rat mRNA for rhodanese.	0.65	1.56	1.37	0.89
S48325_s_at	S48325	This sequence comes from Fig. 2; RLM6; diabetes-inducible cytochrome P450RLM6 [rats, liver, mRNA Partial, 1093 nt].	0.66	1.55	1.09	0.57
rc_AI105448_at	AI105448	EST214737 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIBK51 3' end, mRNA sequence.	0.59	1.53	1.18	0.91
D16554_at	D16554	highly homologous with human UbB gene.; Rat mRNA for polyubiquitin (four repetitive ubiquitins in tandem), complete cds.	0.67	1.53	1.17	0.80
K03045cds_s_at	K03045	Rat retinol-binding protein (RBP) gene, exon 5.	0.62	1.53	1.18	0.81
rc_AA799899_i_at	AA799899	EST189396 Normalized rat heart, Bento Soares Rattus sp. cDNA clone RHEAG67 3' end, mRNA sequence.	0.76	1.51	1.29	1.36
rc_AA893237_at	AA893237	EST197040 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIBD90 3' end, mRNA sequence.	0.64	1.51	1.15	0.81
U47315_s_at	U47315	RNU47315 Rat R2 cerebellum DDRT-T-PCR Rattus norvegicus cDNA clone LIAREST-1, mRNA sequence.	0.60	1.50	1.28	0.78
X62671cds#1_s_at	X62671	Rattus rattus mRNA for hybrid protein (ubiquitin-like protein/rps30).	0.69	1.50	1.21	0.74
S73424_s_at	S73424	macrophage migration inhibitory factor; This sequence comes from Fig. 1; MIF=macrophage migration inhibitory factor [rats, liver, mRNA, 525 nt].	0.71	1.49	1.29	0.89
S45392_at	S45392	This sequence comes from Fig. 1B; hsp90; heat shock protein 90 [rats, brain, mRNA, 2524 nt].	0.70	1.48	1.19	0.73
X05341_at	X05341	thiolase (AA 1-397); Rat mRNA for 3-oxoacyl-CoA thiolase.	0.70	1.47	1.20	0.72
J02597cds_s_at	J02597	preapolipoprotein A-I; Rat apolipoprotein A-I gene, complete cds.	0.67	1.47	1.21	0.81
X15096cds_s_at	X15096	ribosomal phosphoprotein P0 (AA 1-316); Rat mRNA for acidic ribosomal phosphoprotein P0.	0.67	1.46	1.26	0.95
X02291exon_s_at	X02291	R.norvegicus gene encoding aldolase B, exon 9.	0.58	1.45	0.99	0.74
X64401cds_s_at	X64401	testosterone 6beta-hydroxylase; R.norvegicus CYP 3A1 mRNA.	0.69	1.44	1.13	0.73
rc_AA894200_g_at	AA894200	EST198003 Normalized rat spleen, Bento Soares Rattus sp. cDNA clone RSPAS59 3' end, mRNA sequence.	0.60	1.42	1.24	0.97
rc_AA945169_g_at	AA945169	EST200668 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAH44 3' end, mRNA sequence.	0.59	1.42	1.14	0.86
X17665cds_s_at	X17665	ribosomal protein S16 (AA 1-146); Rat mRNA for ribosomal protein S16.	0.68	1.42	1.29	0.90
X04229cds_s_at	X04229	GST Y(b) subunit (aa 1-218); Rat mRNA for glutathione S-transferase (GST) Y(b) subunit (EC 2.5.1.18).	0.63	1.42	1.06	0.72
K00136mRNA_at	K00136	glutathione S-transferase Ya subunit; Rat liver glutathione S-transferase Ya subunit, clones pGTR112 and pGTB38.	0.83	1.41	1.25	1.27
X54793_at	X54793	Rat liver mRNA for heat shock protein (hsp60).	0.89	1.41	1.19	1.08

X78848cds_f_at	X78848	R.norvegicus (Fischer 344) GST Yc1 mRNA.	0.72	1.41	1.02	0.74
rc_AA892582_s_at	AA892582	EST196385 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIAU23 3' end, mRNA sequence.	0.76	1.41	1.16	0.98
M33936_s_at	M33936	cytochrome P450 (IVA3); Rat Cyp4a locus, encoding cytochrome P450 (IVA3) mRNA, complete cds.	0.72	1.39	1.22	1.02
rc_AA875523_s_at	AA875523	UI-R-E0-cv-e-11-0-UI.s1 UI-R-E0 Rattus norvegicus cDNA clone UI-R-E0-cv-e-11-0-UI 3' similar to gi|1041793|gb|U04443|MMU04443 Mus musculus non-muscle myosin light chain 3 (MLC3nm) mRNA, partial cds, mRNA sequence.	0.82	1.39	1.20	0.80
M24239cds#2_f_at	M24239	product of unknown function; Rat cytochrome P450-1/PB-(ps) gene, exon 9.	0.56	1.38	1.04	0.77
D00753_at	D00753	Rat mRNA for contrapsin-like protease inhibitor related protein (CPi-26).	0.69	1.38	1.18	0.89
X05861exon#1-6_s_at	X05861	R.norvegicus fibrinogen gamma-chain gene exons 5-10 and 3'-UT region.	0.74	1.38	1.00	0.80
J02869mRNA_s_at	J02869	cytochrome P-450 IID5; Rat cytochrome P-450 IID5 mRNA, complete cds.	0.68	1.36	1.23	0.86
M18335_f_at	M18335	cytochrome P450; Rat cytochrome P450 mRNA, complete cds.	1.17	0.63	1.27	1.89
U11071_f_at	U11071	Rattus norvegicus Sprague-Dawley polyadenylate-binding protein-related protein mRNA, 3'	0.63	0.58	0.32	0.76
M12337_at	M12337	phenylalanine hydroxylase (EC 1.14.16.1); Rat phenylalanine hydroxylase mRNA, complete cds.	0.62	0.56	1.11	0.92
M11710cds_s_at	M11710	Rattus norvegicus carbamyl phosphate synthetase I precursor (cps) mRNA, partial sequence.	0.99	0.55	1.18	0.80
K03045cds_r_at	K03045	Rat retinol-binding protein (RBP) gene, exon 5.	0.43	0.38	1.92	0.92
M11794cds#2_f_at	M11794	metallothionein 2; metallothionein 1; Rat metallothionein-2 and metallothionein-1 genes, complete cds.	0.08	0.36	0.68	0.65
rc_AA926149_g_at	AA926149	UI-R-A1-eq-h-04-0-UI.s1 UI-R-A1 Rattus norvegicus cDNA clone UI-R-A1-eq-h-04-0-UI 3' similar to gi|203333|gb|M25680|RATCAT12 Rat catalase gene, exons 12 and 13, mRNA	1.12	0.35	0.64	1.50
rc_AA945054_s_at	AA945054	EST200553 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAF82 3' end, mRNA sequence.	1.24	0.13	1.22	2.14

表8C
経口投与 ラット 1週間曝露で有意差を示した遺伝子リスト

Affymetrix No	GI No	Gene name	E/C 5hr	E/C 18hr	E/C 1w	E/C 2w
rc_AI179150_s_at	AI179150	EST222834 Normalized rat spleen, Bento Soares Rattus sp. cDNA clone RSPCC55 3' end, mRNA sequence.	0.00	#DIV/0!	70.08	0.00
S82820mRNA_s_at	S82820	glutathione S-transferase Yc2 subunit; This sequence comes from Fig. 4; GSTA5=glutathione S-transferase Yc2 subunit [rats, Morris hepatoma cell line, mRNA,	1.18	9.21	6.68	11.15
J02749_at	J02749	peroxisomal 3-ketoacyl-CoA thiolase precursor (E.C 2.3.1.16); Rat peroxisomal 3-ketoacyl-CoA thiolase mRNA, complete cds.	1.12	2.32	4.42	9.11
D10261_g_at	D10261	Rattus norvegicus mRNA for 59-kDa bone sialic acid-containing protein, complete cds.	0.29	5.84	4.34	0.76
AF001898_at	AF001898	constitutively expressed cytosolic protein; Rattus norvegicus aldehyde dehydrogenase (ALDH) mRNA, complete cds.	1.09	3.25	3.39	7.13
U08976_at	U08976	Rattus norvegicus Wistar peroxisomal enoyl hydratase-like protein (PXEL) mRNA, complete	0.85	2.26	3.25	3.24
D00729_g_at	D00729	Rat mRNA for delta3, delta2-enoyl-CoA isomerase.	0.78	1.73	2.45	3.39
M27434_s_at	M27434	Rat alpha-2-u globulin mRNA.	0.28	3.40	2.41	0.33
S87544_at	S87544	This sequence comes from Fig 1; polyprotein 1-microglobulin/bikunin [rats, liver, mRNA, 1162 nt].	0.32	2.24	2.41	0.53
rc_AI170568_s_at	AI170568	EST216501 Normalized rat muscle, Bento Soares Rattus sp. cDNA clone RMUAY05 3' end, mRNA sequence.	0.95	1.54	2.36	2.59
X16481_r_at	X16481	Rat mRNA for zinc(2+) binding protein.	0.61	1.52	2.35	0.85
J02612mRNA_s_at	J02612	UDP-glucuronosyltransferase precursor (EC 2.4.1.17); Rat UDP-glucuronosyltransferase mRNA, complete cds.	1.43	0.79	2.24	3.06
X15512_at	X15512	Rat mRNA for apolipoprotein CI.	0.37	1.93	2.20	0.73
J00728cds_f_at	J00728	cytochrome P-450; Rat cytochrome P-450e (phenobarbital-inducible) gene, exon 9.	2.07	2.95	2.12	2.71
J01436cds_s_at	J01436	cytochrome B gene; Rattus norvegicus mitochondrial cytochrome B gene; Pro-, Thr-, Glu-tRNA genes; and URF6.	0.67	1.41	2.10	0.84
AF045464_s_at	AF045464	Rattus norvegicus aflatoxin B1 aldehyde reductase (AFAR) mRNA, complete cds.	1.43	4.35	2.04	2.68
K00996mRNA_s_at	K00996	cytochrome p-450e; Rat cytochrome p-450e (phenobarbital-induced) mRNA, 3' end.	2.21	3.23	1.99	3.02
M57718mRNA_s_at	M57718	Rat cytochrome P-450 IV A1 (CYP4A1) gene, complete cds.	1.02	1.23	1.88	2.30
rc_AI010292_s_at	AI010292	EST204743 Normalized rat lung, Bento Soares Rattus sp. cDNA clone RLUBW56 3' end, mRNA sequence.	0.72	0.70	1.66	1.84
AF007107_s_at	AF007107	soluble form; Rattus norvegicus soluble cytochrome b5 mRNA, complete cds.	0.81	1.31	1.52	1.24
rc_AA943892_at	AA943892	EST199391 Normalized rat brain, Bento Soares Rattus sp. cDNA clone RBRAQ96 3' end, mRNA sequence.	0.85	1.80	0.46	1.12
U11071_f_at	U11071	Rattus norvegicus Sprague-Dawley polyadenylate-binding protein-related protein mRNA, 3'	0.63	0.58	0.32	0.76
M21770_at	M21770	Rat asialoglycoprotein receptor (ASGP) mRNA, segment 2.	0.95	1.12	0.32	0.99

表8D
経口投与 ラット 2週間曝露で有意差を示した遺伝子リスト

Affymetrix No	GI No	Gene name	E/C 5hr	E/C 18hr	E/C 1w	E/C 2w
S82820mRNA_s	S82820	glutathione S-transferase Yc2 subunit; This sequence comes from Fig. 4; GSTA5=glutathione S-transferase Yc2 subunit [rats, Morris hepatoma cell line, mRNA, 1274 nt].	1.18	9.21	6.68	11.15
J02749_at	J02749	peroxisomal 3-ketoacyl-CoA thiolase precursor (E.C 2.3.1.16); Rat peroxisomal 3-ketoacyl-CoA thiolase mRNA, complete cds.	1.12	2.32	4.42	9.11
AF001898_at	AF001898	constitutively expressed cytosolic protein; Rattus norvegicus aldehyde dehydrogenase (ALDH) mRNA, complete cds.	1.09	3.25	3.39	7.13
J02679_s_at	J02679	NAD(P)H:menadione oxidoreductase (EC 1.6.99.2); Rat NAD(P)H:menadione oxidoreductase mRNA, complete cds.	1.43	3.20	1.83	6.44
X07259cds_s_at	X07259	cytochrome P-450 (AA 1 - 509); Rat mRNA for cytochrome P-452.	0.96	1.51	3.31	4.20
D00729_g_at	D00729	Rat mRNA for delta3, delta2-enoyl-CoA isomerase.	0.78	1.73	2.45	3.39
U08976_at	U08976	Rattus norvegicus Wistar peroxisomal enoyl hydratase-like protein (PXEL) mRNA, complete cds.	0.85	2.26	3.25	3.24
J02612mRNA_s	J02612	UDP-glucuronosyltransferase precursor (EC 2.4.1.17); Rat UDP-glucuronosyltransferase mRNA, complete cds.	1.43	0.79	2.24	3.06
K00996mRNA_s	K00996	cytochrome p-450e; Rat cytochrome p-450e (phenobarbital-induced) mRNA, 3' end.	2.21	3.23	1.99	3.02
K03249_at	K03249	peroxisomal enoyl-CoA: hydrotase-3-hydroxyacyl-CoA; Rat peroxisomal enoyl-CoA: hydrotase-3-hydroxyacyl-CoA bifunctional enzyme mRNA, complete cds.	0.89	1.27	1.83	3.01
K00750exon#2-	K00750	Xxx; Rattus norvegicus cytochrome c gene, complete cds; nuclear gene for mitochondrial product.	1.21	0.77	1.36	2.95
rc_AI008641_at	AI008641	EST203092 Normalized rat embryo, Bento Soares Rattus sp. cDNA clone REMBB12 3' end, mRNA sequence.	0.66	1.40	0.75	2.86
J00728cds_f_at	J00728	cytochrome P-450; Rat cytochrome P-450e (phenobarbital-inducible) gene, exon 9.	2.07	2.95	2.12	2.71
S79304_s_at	S79304	COX I; This sequence comes from fig5; Rattus sp. cytochrome oxidase subunit I mRNA, partial cds; and tRNA-Ser gene, complete sequence; mitochondrial genes for mitochondrial products.	0.93	0.60	0.51	2.70
AF045464_s_at	AF045464	Rattus norvegicus aflatoxin B1 aldehyde reductase (AFAR) mRNA, complete cds.	1.43	4.35	2.04	2.68
rc_AI170568_s_a	AI170568	EST216501 Normalized rat muscle, Bento Soares Rattus sp. cDNA clone RMUAY05 3' end, mRNA sequence.	0.95	1.54	2.36	2.59
M13234cds_f_at	M13234	cyt P-450 (AA at 72); Rat cytochrome P-450e gene, exons 7 and 8.	2.20	2.82	1.71	2.33
M57718mRNA_	M57718	Rat cytochrome P-450 IV A1 (CYP4A1) gene, complete cds.	1.02	1.23	1.88	2.30
S83025_s_at	S83025	Y-box protein; This sequence comes from Fig. 2B; conceptual translation presented here differs from translation in publication; TSEP-1; TSH receptor suppressor element-binding protein-1=Y-box protein [rats, FRTL-5 thyroid cell, mRNA, 1512 nt].	0.73	0.99	1.30	2.26
rc_AA858640_s	AA858640	UI-R-E0-bq-d-08-0-UI.s1 UI-R-E0 Rattus norvegicus cDNA clone UI-R-E0-bq-d-08-0-UI 3' similar to emb|X14848|MIRNXX Rat (R. norvegicus) mitochondrial genome, mRNA sequence.	1.46	0.73	1.16	2.22
K01721mRNA_s	K01721	cytochrome P-450(1); Rat P-450(1) variant (phenobarbital-inducible) cytochrome 3' end, flank.	1.34	2.45	1.08	2.15
rc_AA945054_s	AA945054	EST200553 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAF82 3' end, mRNA	1.24	0.13	1.22	2.14
rc_AA892248_g	AA892248	EST196051 Normalized rat kidney, Bento Soares Rattus sp. cDNA clone RKIAO18 3' end, mRNA sequence.	0.90	0.68	1.20	1.97
M18335_f_at	M18335	cytochrome P450; Rat cytochrome P450 mRNA, complete cds.	1.17	0.63	1.27	1.89

rc_AI010292_s_	AI010292	EST204743 Normalized rat lung, Bento Soares Rattus sp. cDNA clone RLUBW56 3' end, mRNA sequence.	0.72	0.70	1.66	1.84
rc_AI176546_at	AI176546	EST220133 Normalized rat ovary, Bento Soares Rattus sp. cDNA clone ROVBT45 3' end, mRNA sequence.	1.05	1.54	1.39	1.78
X72792cds_s_at	X72792	class I; R.norvegicus Adh-3 mRNA.	0.76	1.04	1.47	1.58
M26125_at	M26125	epoxide hydrolase; Rat epoxide hydrolase mRNA, complete cds.	0.70	1.89	1.30	1.53
rc_AA945611_a	AA945611	EST201110 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAP77 3' end, mRNA	0.77	0.86	1.47	1.48
L14004UTR#1_	L14004	Rattus norvegicus polymeric immunoglobulin receptor AATTAA-containing 3'UTR Group 1 mRNA sequence.	0.57	1.60	1.19	0.75
X02291exon_s_	X02291	R.norvegicus gene encoding aldolase B, exon 9.	0.58	1.45	0.99	0.74
X64401cds_s_at	X64401	testosterone 6beta-hydroxylase; R.norvegicus CYP 3A1 mRNA.	0.69	1.44	1.13	0.73
S45392_at	S45392	This sequence comes from Fig. 1B; hsp90; heat shock protein 90 [rats, brain, mRNA, 2524 nt].	0.70	1.48	1.19	0.73
rc_AA965264_a	AA965264	UI-R-C0-hd-b-11-0-UI.s1 UI-R-C0 Rattus norvegicus cDNA clone UI-R-C0-hd-b-11-0-UI 3', mRNA sequence.	0.57	1.59	0.93	0.73
X05341_at	X05341	thiolase (AA 1-397); Rat mRNA for 3-oxoacyl-CoA thiolase.	0.70	1.47	1.20	0.72
X04229cds_s_at	X04229	GST Y(b) subunit (aa 1-218); Rat mRNA for glutathione S-transferase (GST) Y(b) subunit (EC	0.63	1.42	1.06	0.72
M15327_at	M15327	alcohol dehydrogenase; Rat alcohol dehydrogenase (ADH) mRNA, complete cds.	0.62	1.63	1.17	0.71
J01435cds#4_s	J01435		0.59	2.01	1.09	0.70
M94548_at	M94548	Rattus norvegicus hepatic tumor cytochrome P450 (CYP4F1) mRNA, complete cds.	0.71	1.24	1.11	0.70
rc_AA818226_s	AA818226	UI-R-A0-ah-g-06-0-UI.s1 UI-R-A0 Rattus norvegicus cDNA clone UI-R-A0-ah-g-06-0-UI 3' similar to emb|X14209|RNCOXIV Rat mRNA for cytochrome c oxidase subunit IV, mRNA sequence.	0.53	1.92	1.76	0.66
U31866_g_at	U31866	Rattus norvegicus Nclone10 mRNA.	0.83	1.06	1.21	0.65
rc_AI010453_at	AI010453	EST204904 Normalized rat lung, Bento Soares Rattus sp. cDNA clone RLUBZ64 3' end, mRNA sequence.	0.19	5.54	4.82	0.65
H32189_s_at	H32189	EST107045 Rat PC-12 cells, untreated Rattus sp. cDNA clone RPCBK23 5' end similar to Glutathione S-transferase, mRNA sequence.	0.61	1.27	0.97	0.64
rc_AI237836_g_	AI237836	EST234398 Normalized rat placenta, Bento Soares Rattus sp. cDNA clone RPLDG58 3' end, mRNA sequence.	0.80	0.93	1.30	0.64
M29866_s_at	M29866	complement component C3; Rat complement component C3 mRNA, partial cds.	0.63	1.26	1.21	0.63
J05425cds_s_at	J05425	cytochrome c oxidase; Rat cytochrome c oxidase subunit IV (COXIV) gene, complete cds.	0.43	2.12	1.82	0.61
J01435cds#8_s	J01435		0.51	1.72	1.18	0.60
D14564cds_s_a	D14564	Rattus norvegicus gene for L-gulono-gamma-lactone oxidase, exon 7.	0.88	0.67	0.66	0.59
S48325_s_at	S48325	This sequence comes from Fig. 2; RLM6; diabetes-inducible cytochrome P450RLM6 [rats, liver, mRNA Partial, 1093 nt].	0.66	1.55	1.09	0.57
S76779_s_at	S76779	apolipoprotein E, ApoE; This sequence comes from Fig. 1; ApoE; rApoE=apolipoprotein E [rats, liver, mRNA Partial, 951 nt].	0.11	4.14	2.82	0.55
J02810mRNA_s	J02810	glutathione S-transferase Yb-1 subunit; Rat prostate glutathione S-transferase mRNA, complete	0.38	1.89	1.15	0.54
S87544_at	S87544	This sequence comes from Fig 1; polyprotein 1-microglobulin/bikunin [rats, liver, mRNA, 1162 nt].	0.32	2.24	2.41	0.53
M33648_at	M33648	3-hydroxy-3-methylglutaryl-CoA synthase precursor (EC 4.1.3.5); Rat mitochondrial 3-hydroxy-3-methylglutaryl-CoA synthase mRNA, complete cds.	0.64	2.21	1.13	0.50
rc_AI169758_at	AI169758	EST215657 Normalized rat liver, Bento Soares Rattus sp. cDNA clone RLIAS88 3' end, mRNA	0.81	1.09	1.16	0.48

rc_AA866237_s	AA866237	UI-R-A0-bg-f-12-0-UI.s1 UI-R-A0 Rattus norvegicus cDNA clone UI-R-A0-bg-f-12-0-UI 3' similar to emb|V01222|RNALBU Messenger RNA for rat preproalbumin gi|202823|gb|J00698|RATALBM Rat serum albumin mRNA, mRNA sequence.	0.52	5.90	1.26	0.47
U02506UTR#1_	U02506	Rattus norvegicus clone 7 polymeric immunoglobulin receptor mRNA, 3' untranslated region microsatellite repeats.	0.15	15.60	4.66	0.44
rc_AI102505_at	AI102505	EST211794 Normalized rat embryo, Bento Soares Rattus sp. cDNA clone REMBO49 3' end, mRNA sequence.	0.68	1.54	1.04	0.41
rc_AA860062_g	AA860062	UI-R-E0-bz-h-06-0-UI.s2 UI-R-E0 Rattus norvegicus cDNA clone UI-R-E0-bz-h-06-0-UI 3' similar to emb|V01222|RNALBU Messenger RNA for rat preproalbumin gi|202823|gb|J00698|RATALBM Rat serum albumin mRNA, mRNA sequence.	0.00	10654.00	180.09	0.40
M27434_s_at	M27434	Rat alpha-2-u globulin mRNA.	0.28	3.40	2.41	0.33
M20131cds_s_a	M20131	cytochrome P450IIE1; Rat cytochrome P450IIE1 gene, complete cds.	0.58	1.56	1.41	0.16
D38380_g_at	D38380	Rattus norvegicus mRNA for transferrin, complete cds.	0.00	76.66	10.42	0.06
rc_AI179150_s_	AI179150	EST222834 Normalized rat spleen, Bento Soares Rattus sp. cDNA clone RSPCC55 3' end, mRNA sequence.	0.00	#DIV/0!	70.08	0.00

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Ⅰ－2－3．トリクロロエチレン in vitro 予備実験

要旨　肝臓は多種多様な生理機能を営む代謝活性の高い臓器であり、薬剤や有害化学物質の毒性評価をしていく上では重要な臓器であるが、in vivo の生体反応を in vitro で再現するのは難しく種々の努力がこれまでになされてきた。コラーゲナーゼを用いる肝還流法は比較的高い肝細胞の viability を保ったまま細胞を分離する一般的な方法であり、我々もこの方法を採用した。また分離した細胞を培養する種々の条件が in vivo の生体反応の再現性に大きく関与しており、様々な研究が行われている。特に細胞外マトリックスは初代培養肝細胞の長期培養を可能とし、肝細胞の形態や機能の維持、チトクローム系酵素の活性維持に大きく貢献する。我々は幾つかの細胞外マトリックス中で初代培養肝細胞を培養し、曝露実験を行って目的とする遺伝子発現の変化が得られる細胞外マトリックスの environment、細胞濃度及び培地を購入するヒトの初代培養肝細胞の environment も考慮して決定した。即ち、コラーゲンを培養ディッシュにコーティングした上に分離した肝細胞を 1.5 x 10^6cell/ml で撒き、インスリンとデキサメサゾンン含有の WE 培地で細胞がディッシュ上に接着するまで培養し、細胞が接着後コラーゲンゲルを細胞の上に重層させて培地を Hepatozyme に変更して培養する。これらの方法により、85%以上の viability がある肝細胞を分離し、72 時間以上の培養後でもこの viability を保ち、かつ種々のチトクローム系酵素の誘導能を有する初代培養肝細胞の構築に成功した。in vitro 実験の曝露条件を決定するにあたり、我々は in vivo 実験で TCE 曝露によって DNA チップ上で遺伝子発現が変化し、かつその遺伝子発現変化が既知の知見から判断して適当であると思われる遺伝子を複数個選択した。これらの遺伝子は主に TCE の肝臓における代謝に関与しているチトクローム系酵素、及びペルオキシゾーム関連酵素等である。初代培養肝細胞に種々の曝露濃度と曝露時間で TCE を曝露し、得られた RNA を定量 PCR 法によって半定量し予備実験を行ったところ、これらのチトクローム系酵素の誘導が遺伝子レベルで観察される曝露条件を見出すことが出来た。具体的には TCE の主な代謝経路では、マウスとラットにおいては TCE が CYP2E1 によって CH に代謝されることが分かっている。5 mM TCE をマウスの初代培養肝細胞に曝露させると、24 時間後にはほぼ 3 倍の遺伝子発現増加が観察された。また、in vivo 実験でその遺伝子発現の増加が確認された CYP2A4 が 5mM TCE 曝露で 24 時間後に 2 倍以上の遺伝子発現の増加を示した。

in vitro 実験

○目的

in vitro 実験でマウス、ラット及びヒトにおける遺伝子発現プロファイルが得られれば 3 種間での比較が可能となり、命題であるヒトの TCE 曝露による遺伝子発現の変化がマウスとラットのどちらの種と近いのかという問いに答えることが可能となる。また、in vitro 実験のマウスとラットの遺伝子発現プロファイルは in vivo 実験のマウスとラットの遺伝子発現プロファイルと比較可能であるので、in vitro と in vivo にお