



図 17 MDA-MB-231 細胞株における減少傾向遺伝子のプロット
 (箱の上下はデータ点、中線は平均値)

	Estrogen Only	E+Tamoxifen L	E+Tamoxifen H	Estrogen Free
BT474	BTT1	BTT2	BTT3	BTT4
MCF7	MCT1	MCT2	MCT3	MCT4
MDA-MB-231	MDT1	MDT2	MDT3	MDT4
SK-BR-3	SKT1	SKT2	SKT3	SKT4

表 1 細胞株と処理の組み合わせ

各セルはデータ解析における変数名、上記組み合わせの反復は R1、R2 と記載

	Estrogen Only	E+Tamoxifen L	E+Tamoxifen H	Estrogen Free
BT474	0.8664495	0.8566374	0.8401288	0.851142
MCF7	0.8700674	0.8393638	0.8230427	0.8538145
MDA-MB-231	0.8616289	0.8359358	0.8971913	0.8512897
SK-BR-3	0.8786277	0.817145	0.9019523	0.8640634

表 2 同一条件の実験間における発現強度のピアソン相関係数

Index	Function	Raw p
652	recA-like protein HsRad51; DNA repair protein RAD51 homolog	0.0048
415	B-raf proto-oncogene (RAF1)	0.0050
498	phospholipase C beta 2 (PLC-beta 2; PLCB2); 1-phosphatidylinositol 4、 5-bisphosphate phosphodiesterase beta 2	0.0074
201	p21-activated kinase alpha (PAK-alpha; PAK1)	0.0076
667	RADS0	0.0088
719	cytosolic superoxide dismutase 1 (SOD1)	0.0090

表 3 処理に関連する遺伝子

(未調整 p 値が 0.01 未満のものを抽出)

Index	Function	Raw p
415	B-raf proto-oncogene (RAF1)	0.0025
652	recA-like protein HsRad51; DNA repair protein RAD51 homolog	0.0028
498	phospholipase C beta 2 (PLC-beta 2; PLCB2); 1-phosphatidylinositol 4、5-bisphosphate phosphodiesterase beta 2	0.0035
719	cytosolic superoxide dismutase 1 (SOD1)	0.0043
402	serine/threonine-protein kinase NEK2; NIMA-related protein kinase 2; NIMA-like protein kinase 1; HSPK 21	0.0047
625	growth arrest & DNA damage-inducible protein 45 beta (GADD45 beta)	0.0054
19	laminin alpha 4 subunit precursor (laminin A4; LAMA4)	0.0070
3	Vascular endothelial growth factor receptor 2 precursor (VEGFR2); kinase insert domain receptor (KDR); FLK1	0.0085
201	p21-activated kinase alpha (PAK-alpha; PAK1)	0.0096

表 4 細胞と処理の交互作用に関連する遺伝子
(未調整 p 値が 0.01 未満のものを抽出)

Index	Function
424	cAMP-dependent 3', 5'-cyclic phosphodiesterase 4B (DPDE4); PDE32
55	endoglin precursor (ENG; END); CD105 antigen
766	type I cytoskeletal 16 keratin (KRT16); cytokeratin 16 (CK16); pseudo-keratin K16 type I
537	retinoic acid receptor beta (RXR-beta; RXRB)
486	ribosomal protein kinase B (RSKB)
125	BCL2 & p53 binding protein Bbp/53BP2 (BBP/53BP2)

表 5 MCF7 において遺伝子発現に増加傾向が示唆された遺伝子

Index	Function
749	multidrug resistance-associated protein 3 (MRP3); MLP2; ABCC3
760	GTP-binding nuclear protein RAN (TC4)
737	thioredoxin reductase
315	farnesyltransferase beta
721	glutathione peroxidase (GSHPX1; GPX1)
712	adducin gamma subunit
773	type I cytoskeletal 9 keratin (KRT9); cytokeratin 9 (CK 9)
748	ATP-binding cassette subfamily B (MDR/TAP) member 1 (ABCB1); multiple drug resistance 1 protein (MDR1); P glycoprotein 1 (PGY1)

表 6 MCF7 において遺伝子発現に減少傾向が示唆された遺伝子

Index	Function
441	FOS-related antigen 1 (FRA1); FOS-like antigen 1 (FOSL1)
401	serine/threonine-protein kinase NEK3; NIMA-related protein kinase 3; HSPK 36
705	UV excision repair protein RAD23 homolog A (RAD23A; hHR23A)
38	female organ- & adipocyte-specific extracellular matrix protein 2 (ECM2)
507	ras-related protein RAP-1A; C21KG; KREV-1 protein; GTP-binding protein SMG-p21A; G-22K
600	cbl-associated protein SH3P12
72	laminin gamma 2 subunit precursor (LAMC2)
261	CC chemokine receptor type 4 (CMKBR4; CCCKR4; CCR4)
352	insulin precursor (INS)
81	matrix metalloproteinase 16 precursor (MMP16); membrane-type matrix metalloproteinase 3 (MT-MMP3); MMP-X2
497	phospholipase C (PLCL)

表 7 BT474 において遺伝子発現に増加傾向が示唆された遺伝子

Index	Function
102	tissue inhibitor of metalloproteinase 2 precursor (TIMP2)
18	40S ribosomal protein SA (RPSA); 34/67-kDa laminin receptor; laminin receptor 1 (LAMR1); colon carcinoma laminin-binding protein; NEM/1CHD4
340	mitochondrial brown fat uncoupling protein 1 (UCP1)
109	vascular endothelial growth factor B precursor (VEGFB) + VEGF-related factor 186 (VRF186)
433	mitogen-activated protein kinase P38 beta (MAP kinase P38 beta); stress-activated protein kinase 2 (SAPK2)
79	matrix metalloproteinase 15 (MMP15); membrane-type matrix metalloproteinase 2 (MT-MMP2)

表 8 BT474 において遺伝子発現に減少傾向が示唆された遺伝子

Index	Function
512	ras-related protein RAB1A; YPT1-related protein
707	guanine nucleotide release/exchange factor (GNRP); ras-GRF; sos
501	phospholipase C beta 4 (PLC-beta 4; PLCB4)
10	cadherin 8 (CDH8)
6	cadherin 11 precursor (CDH11); osteoblast-cadherin (OB-cadherin); OSF4
9	cadherin 4 (CDH4); retinal cadherin precursor (R-cadherin; RCAD)
459	mitogen-activated protein kinase kinase kinase (MAPKKK; MAP3K); MTK1
67	integrin beta 5 precursor (ITGB5)
387	ras homolog gene family member C (RHOC; ARHC); ARH9; H9
281	adenine phosphoribosyltransferase (APRT)
35	wingless-related MMTV integration site 8b protein (WNT8B)

表 9 SK-BR-3 において遺伝子発現に増加傾向が示唆された遺伝子

Index	Function
379	erythropoietin receptor (EPOR)
525	ras-related protein RAB5B
278	microsomal UDP-glucuronosyltransferase 2B15 precursor (UDPGT); UDPGTH-3; UGT2B15 + microsomal 2B10 precursor (UDPGT); UGT2B10 + 2microsomal B8 precursor
182	cyclin-dependent kinase inhibitor 1C (CDKN1C); p57-KIP2
404	c-src kinase (CSK); protein-tyrosine kinase cyl
345	Lymphopain
747	canalicular multispecific organic anion transporter; multidrug resistance-associated protein 2 (MRP2); canalicular multidrug resistance protein
669	BRCA1-associated ring domain protein
423	allograft inflammatory factor 1 (AIF1); ionized calcium-binding adapter molecule 1
708	telomerase reverse transcriptase (hTERT)
646	thioredoxin peroxidase 2 (TDPX2); thioredoxin-dependent peroxide reductase 2; proliferation-associated gene (PAG); natural killer cell enhancing factor A (NKEFA)
274	microsomal UDP-glucuronosyltransferase 1-2 precursor (UDPGT; UGT1. 2; UGT1B; GNT1); HLUGP4

表 10 SK-BR-3 において遺伝子発現に減少傾向が示唆された遺伝子

Index	Function
1	vascular endothelial growth factor C precursor (VEGFC); vascular endothelial growth factor related protein (VRP); FLT4 ligand
21	collagen VI alpha 3 subunit (COL6A3)
122	fas-activated serine/threonine kinase (FAST)
367	p53-dependent cell growth regulator CGR19
17	integrin-linked kinase (ILK)
376	insulin-like growth factor IA precursor (IGF1A); IGFBP1; somatomedin C + insulin-like growth factor I (IGF1)
82	matrix metalloproteinase 17 (MMP17); membrane-type matrix metalloproteinase 4 (MT-MMP4)
305	DNA polymerase beta (POLB)
193	putative cyclin G1-interacting protein (CG11)
16	urokinase-type plasminogen activator precursor (U-plasminogen activator; UPA)
323	laminin beta 2 subunit precursor (laminin B2; LAMB2); S-laminin
5	cadherin 6 precursor (CDH6); kidney cadherin (K-cadherin)

表 11 MDA-MB-231 において遺伝子発現に増加傾向が示唆された遺伝子

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Index	Function
239	interleukin 4 precursor (IL4); B-cell stimulatory factor 1 (BSF-1)
627	DNAJ protein homolog 2 (DNAJ2; hDJ2; HSJ2)
141	TNF-related apoptosis inducing ligand (TRAIL); APO-2 ligand (APO2L)
689	DNA polymerase iota (POLI); RAD30B
523	ras-related protein RAB3B
459	mitogen-activated protein kinase kinase kinase (MAPKKK; MAP3K); MTK1
501	phospholipase C delta-1 (PLC-delta 1; PLCD1); PLC-III
528	ras-related protein RAB7
624	growth arrest & DNA damage-inducible protein (GADD45); DNA damage-inducible transcript 1 (DDIT1)
540	NCK melanoma cytoplasmic src homolog (HSNCK)
529	ras-related protein RAB8; MEL oncogene
504	type II cGMP-dependent protein kinase

表 12 MDA-MB-231 において遺伝子発現に減少傾向が示唆された遺伝子

研究成果の刊行に関する一覧表

雑誌

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