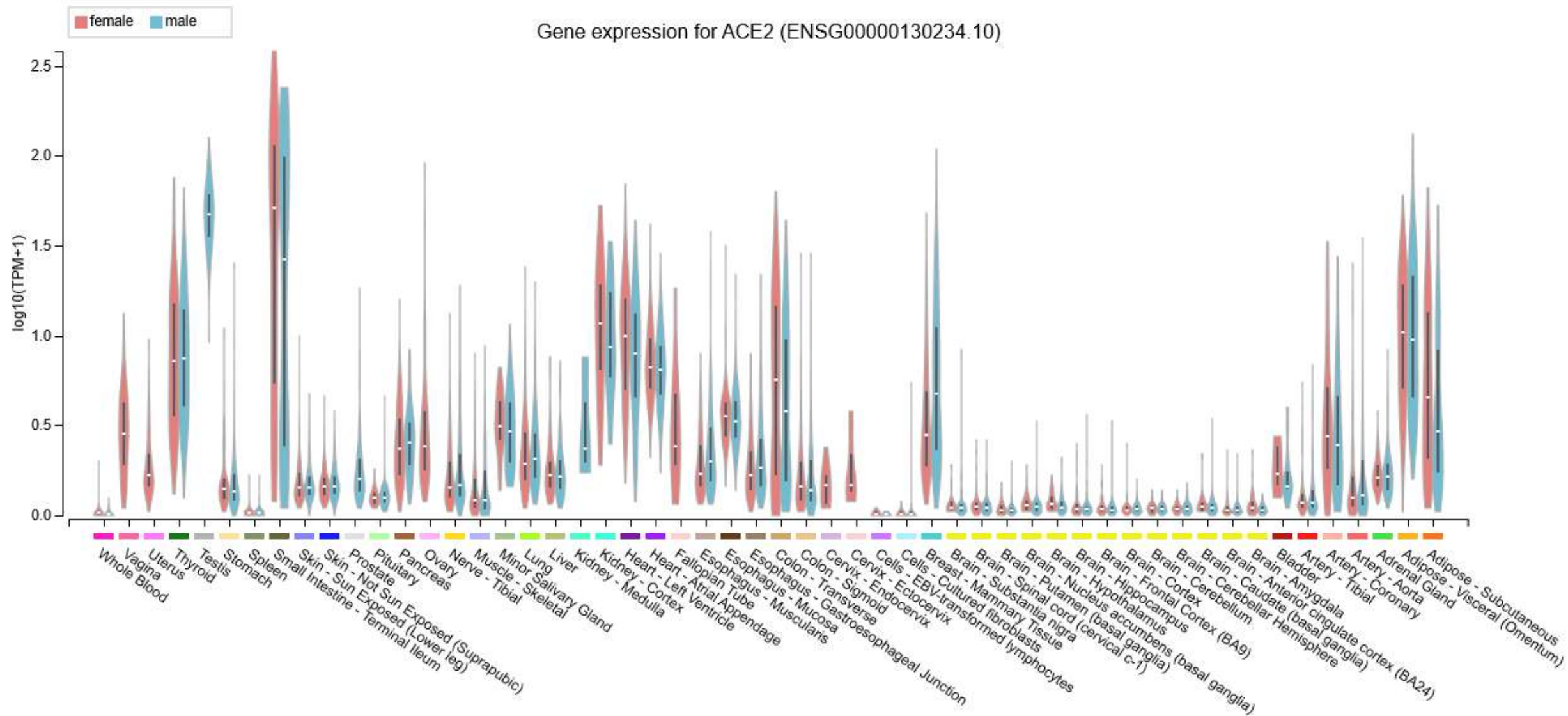


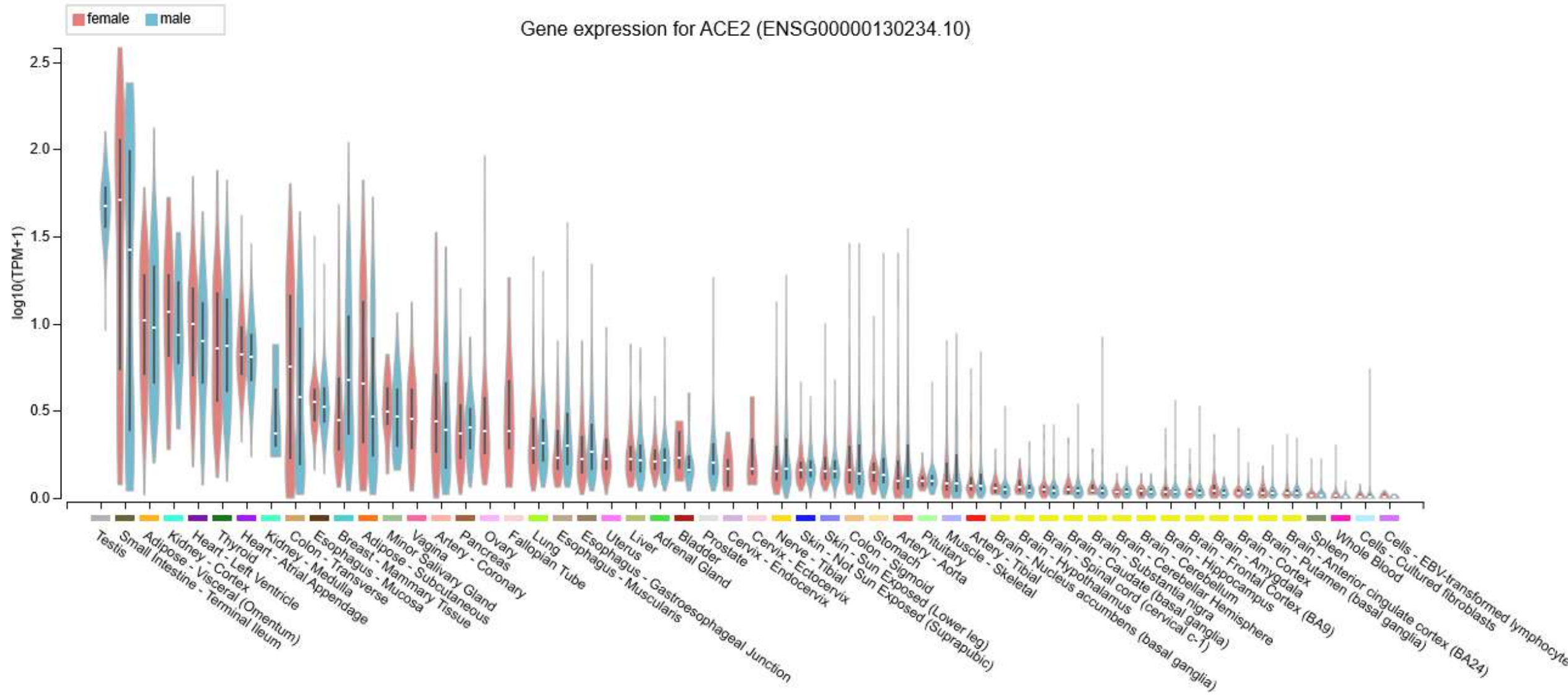
ACE2 and FURIN

Supplemental Figure S1. Expression in human cells, tissues, and organs

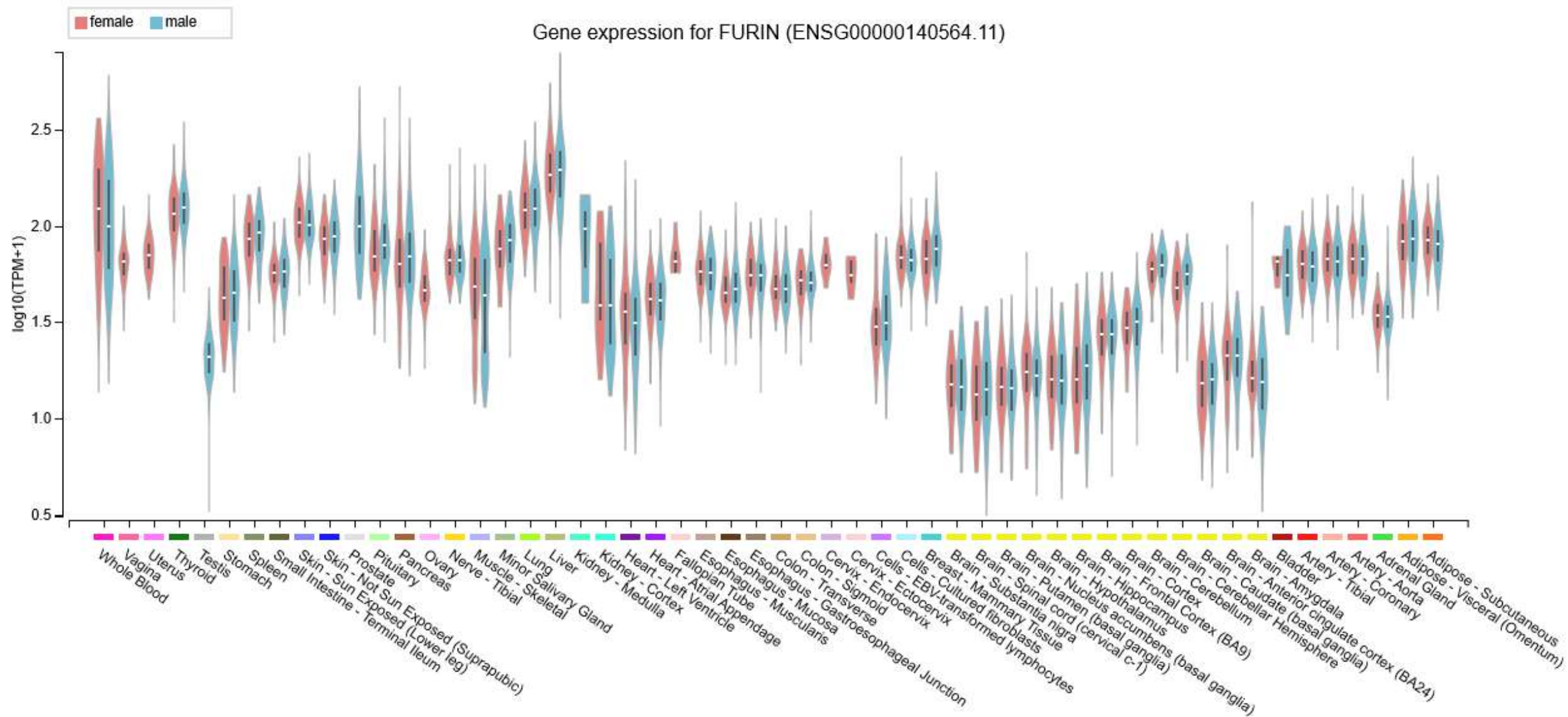
RNA-Seq Expression Data from GTEx (53 Tissues, 570 Donors)



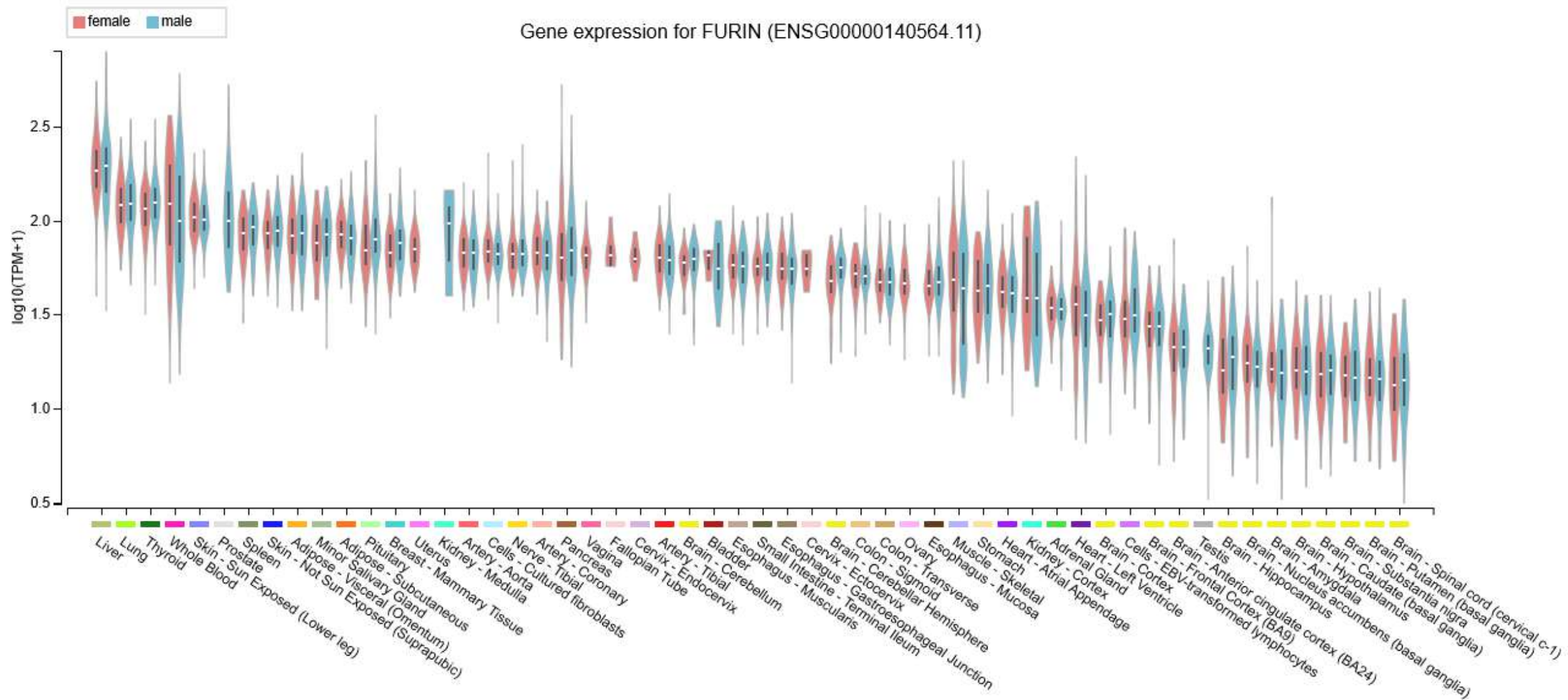
RNA-Seq Expression Data from GTEx (53 Tissues, 570 Donors)



RNA-Seq Expression Data from GTEx (53 Tissues, 570 Donors)



RNA-Seq Expression Data from GTEx (53 Tissues, 570 Donors)

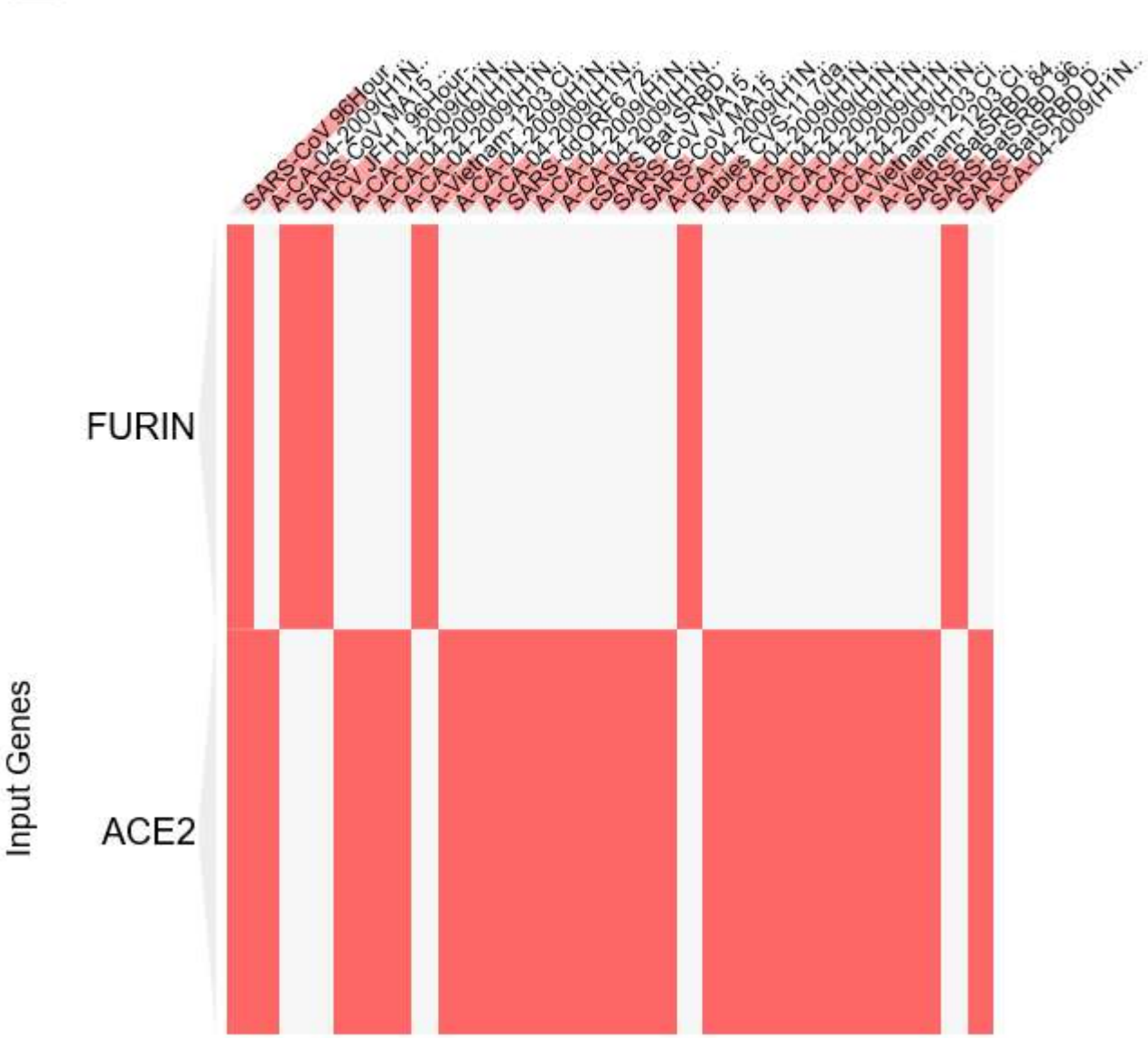
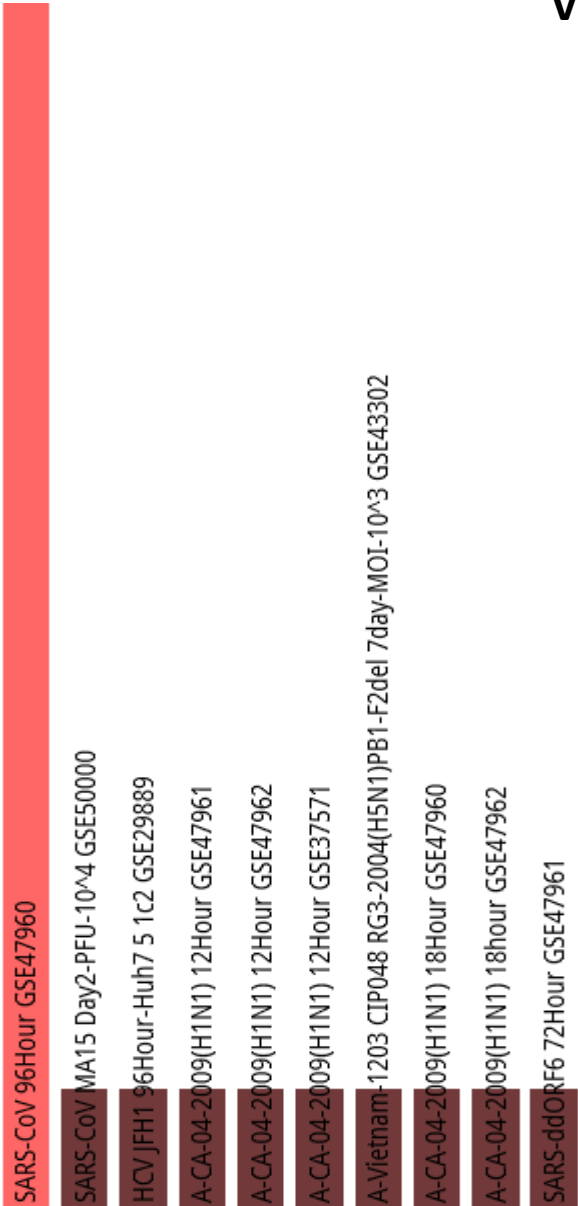


ACE2 and FURIN

Supplemental Figure S2. Effects of viral challenges on expression

Virus Perturbations from GEO up

Enriched Terms



Profile: *FURIN* expression in peripheral blood mononuclear cells (PBMCs)

GDS1028 / 201945_at

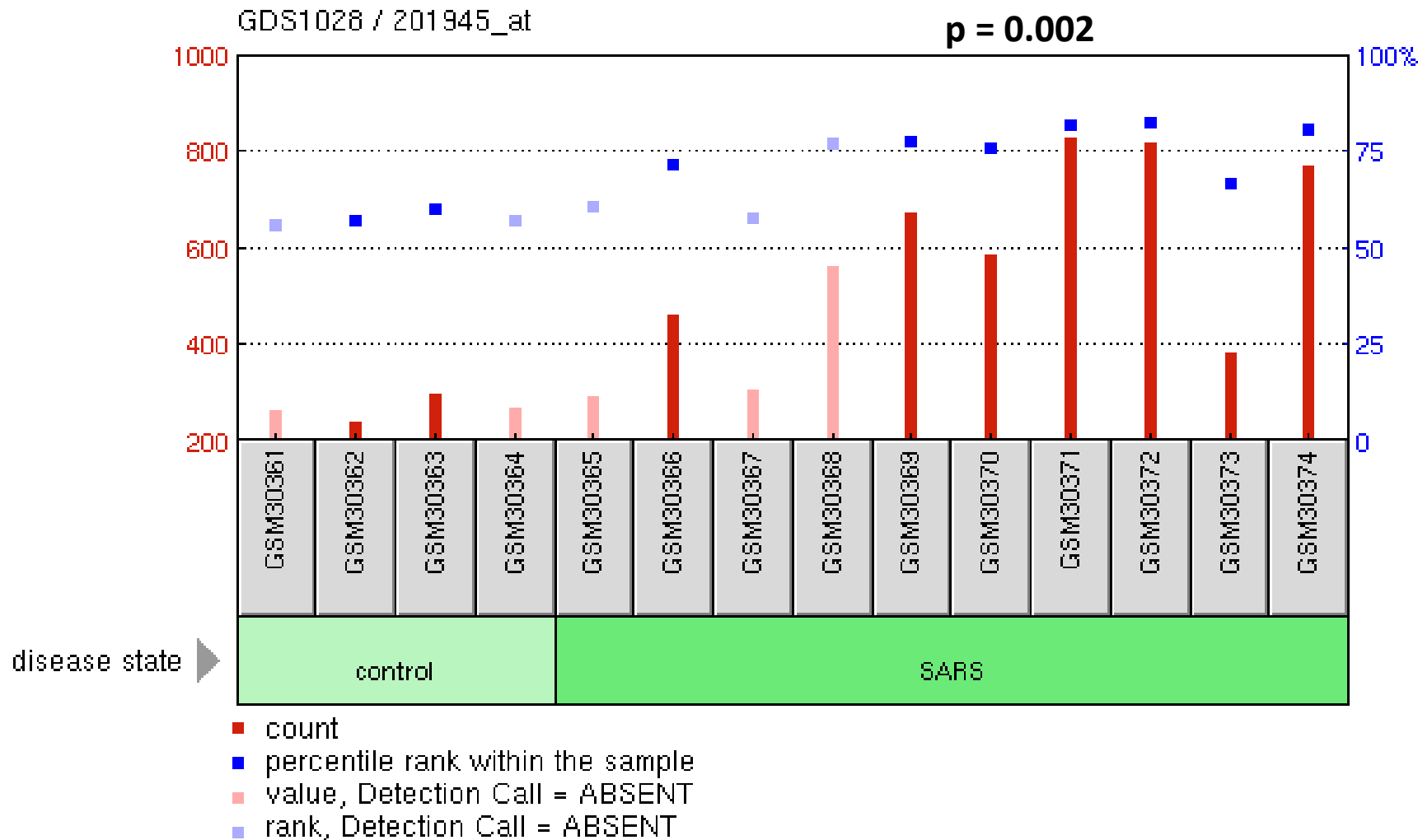
Title

Severe acute respiratory syndrome expression profile

Organism

Homo sapiens

FURIN expression in peripheral blood mononuclear cells (PBMCs)



Sample	Title	Value
GSM30361	N1	264.2
GSM30362	N2	241.7
GSM30363	N3	298.1
GSM30364	N4	268.5
GSM30365	S1	295.5
GSM30366	S2	464
GSM30367	S3	309.7
GSM30368	S4	564.1
GSM30369	S5	674.4
GSM30370	S6	588
GSM30371	S7	830.2
GSM30372	S8	818.8
GSM30373	S9	385.1
GSM30374	S10	771.2

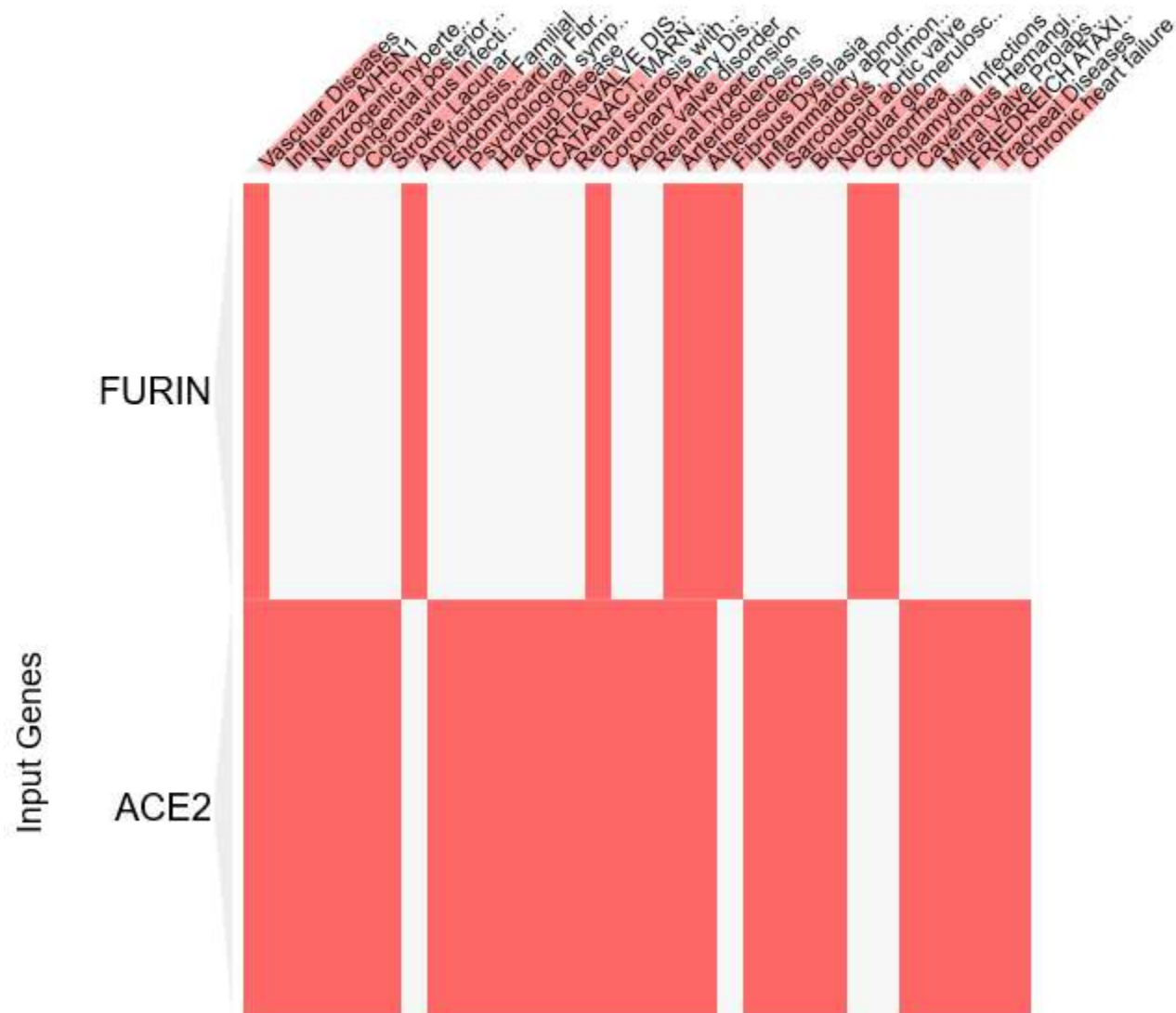
ACE2 and FURIN

Supplemental Figure S3. Effects of common human diseases on expression changes

Distinct patterns of diseases associated with expression changes of the *ACE2* and *FURIN* genes

DisGeNET

Enriched Terms



Profile: *ACE2* expression

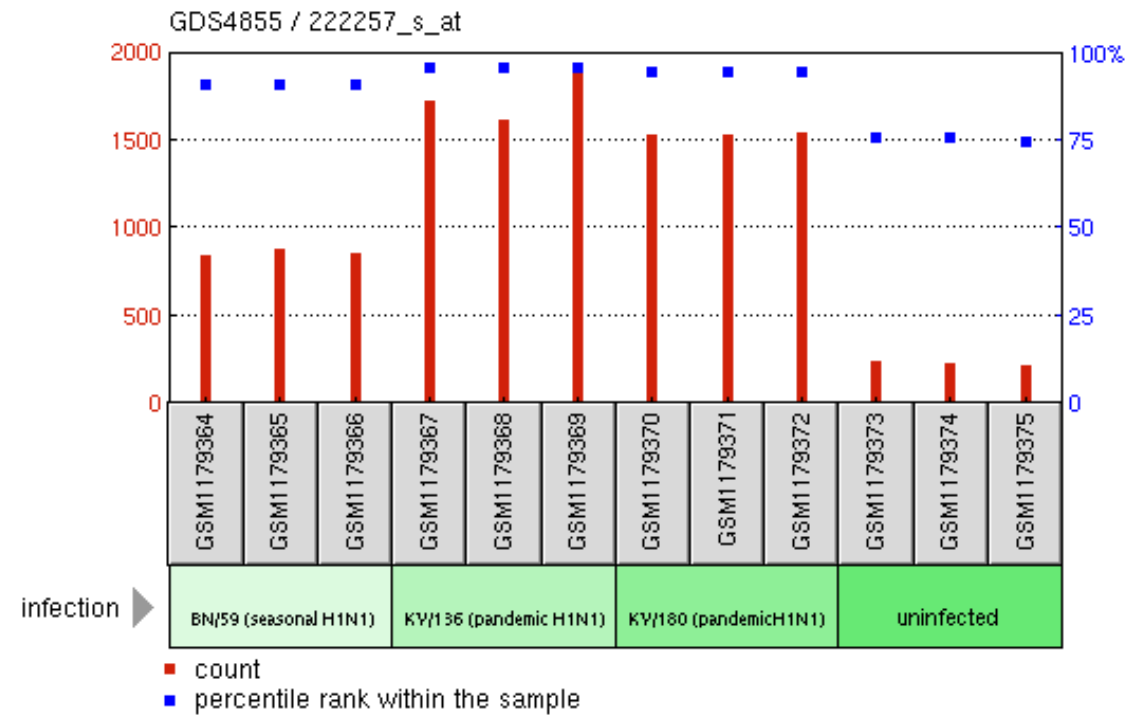
GDS4855 / 222257_s_at

Title

Pandemic and seasonal H1N1 influenza virus infections of bronchial epithelial cells in vitro

Organism

Homo sapiens



Effects of pandemic and seasonal H1N1 influenza virus infections on *ACE2* expression in human bronchial epithelial cells in vitro

Sample	Title	Value	
GSM1179364	wdNHBE with BN/59 at 36hpi, biological rep1	847.236	
GSM1179365	wdNHBE with BN/59 at 36hpi, biological rep2	890.883	p < 0.05
GSM1179366	wdNHBE with BN/59 at 36hpi, biological rep3	862.141	
GSM1179367	wdNHBE with KY/136 at 36hpi, biological rep1	1734.88	
GSM1179368	wdNHBE with KY/136 at 36hpi, biological rep2	1614.9	p < 0.05
GSM1179369	wdNHBE with KY/136 at 36hpi, biological rep3	1883.21	
GSM1179370	wdNHBE with KY/180 at 36hpi, biological rep1	1533.9	
GSM1179371	wdNHBE with KY/180 at 36hpi, biological rep2	1540.84	p < 0.05
GSM1179372	wdNHBE with KY/180 at 36hpi, biological rep3	1552.49	
GSM1179373	wdNHBE uninfected at 36hpi, biological rep1		242.199
GSM1179374	wdNHBE uninfected at 36hpi, biological rep2		238.781
GSM1179375	wdNHBE uninfected at 36hpi, biological rep3		224.471

Profile: ACE expression

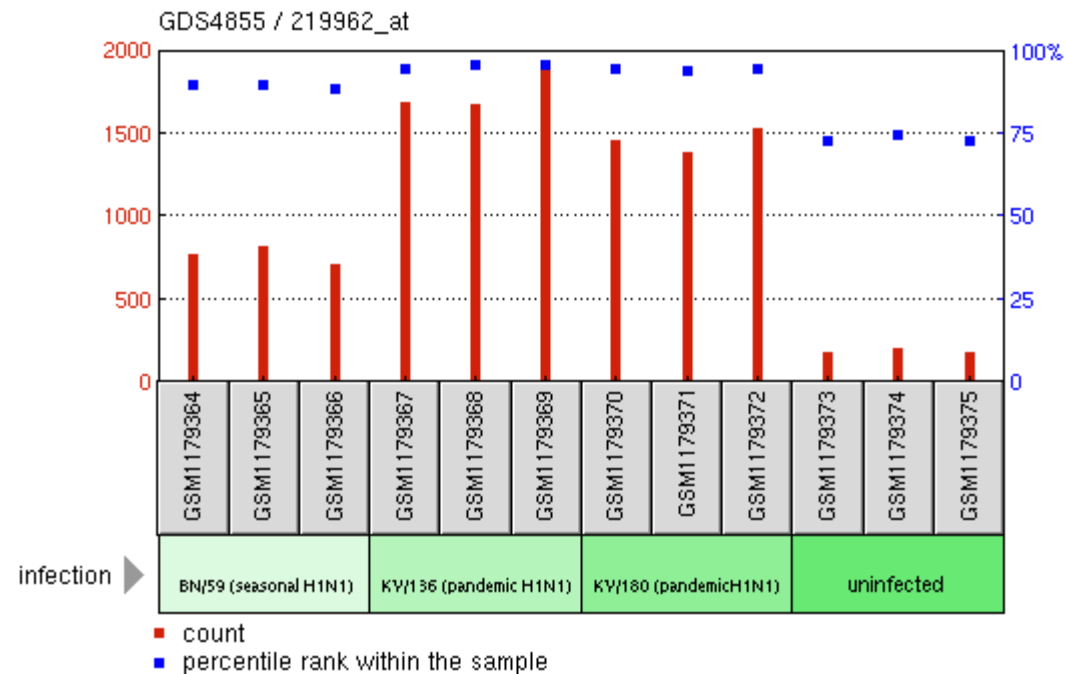
GDS4855 / 219962_at

Title

Pandemic and seasonal H1N1 influenza virus infections of bronchial epithelial cells in vitro

Organism

Homo sapiens



Effects of pandemic and seasonal H1N1 influenza virus infections on ACE2 expression in human bronchial epithelial cells in vitro

Sample	Title	Value	
GSM1179364	wdNHBE with BN/59 at 36hpi, biological rep1	779.935	
GSM1179365	wdNHBE with BN/59 at 36hpi, biological rep2	825.417	p < 0.05
GSM1179366	wdNHBE with BN/59 at 36hpi, biological rep3	713.858	
GSM1179367	wdNHBE with KY/136 at 36hpi, biological rep1	1691.88	
GSM1179368	wdNHBE with KY/136 at 36hpi, biological rep2	1675.14	p < 0.05
GSM1179369	wdNHBE with KY/136 at 36hpi, biological rep3	1923.87	
GSM1179370	wdNHBE with KY/180 at 36hpi, biological rep1	1464.32	
GSM1179371	wdNHBE with KY/180 at 36hpi, biological rep2	1393.98	p < 0.05
GSM1179372	wdNHBE with KY/180 at 36hpi, biological rep3	1536.46	
GSM1179373	wdNHBE uninfected at 36hpi, biological rep1		190.363
GSM1179374	wdNHBE uninfected at 36hpi, biological rep2		214.431
GSM1179375	wdNHBE uninfected at 36hpi, biological rep3		185.11

Profile: ACE2 expression

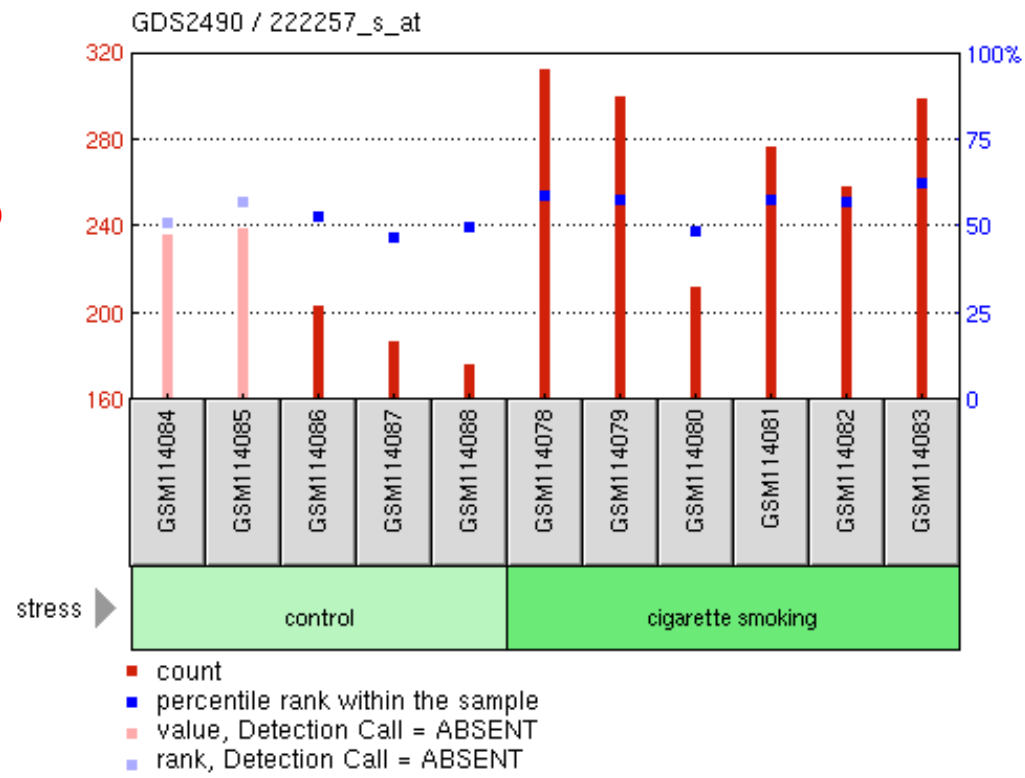
GDS2490 / 222257_s_at

Title

Large airway epithelium response to cigarette smoking (HG-133A)

Organism

Homo sapiens



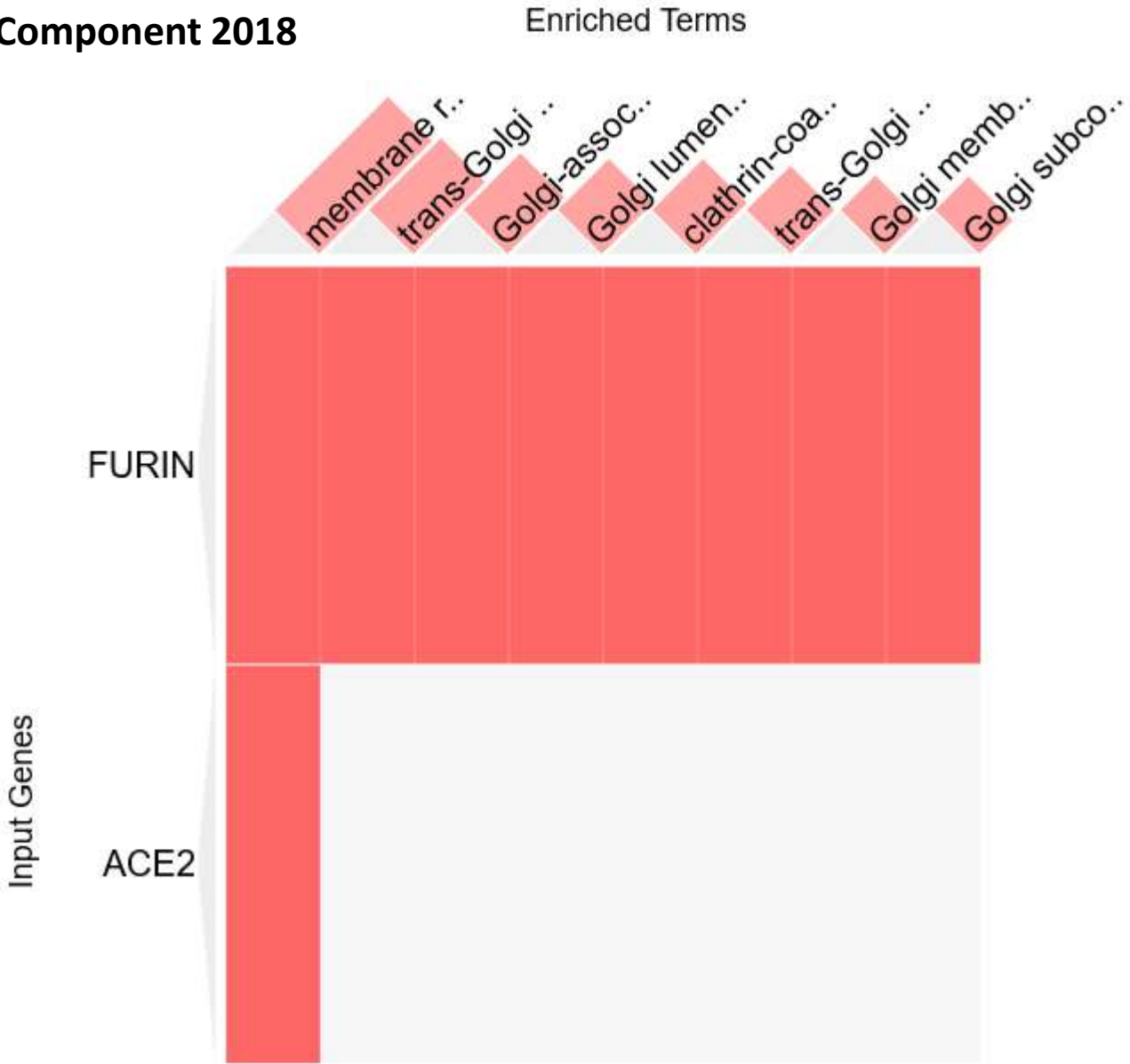
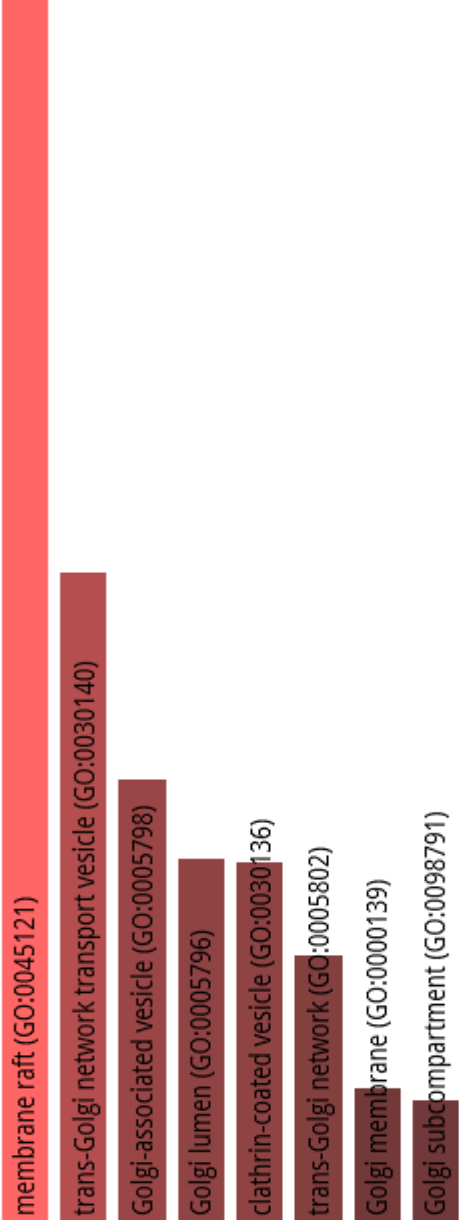
p < 0.05

Sample	Title	Value
GSM114084	large airways, non-smoker 1, MAS5	236.4
GSM114085	large airways, non-smoker 2, MAS5	239.9
GSM114086	large airways, non-smoker 3, MAS5	203.8
GSM114087	large airways, non-smoker 4, MAS5	187.6
GSM114088	large airways, non-smoker 5, MAS5	176.5
GSM114078	large airways, smoker 1, MAS5	313.1
GSM114079	large airways, smoker 2, MAS5	300.5
GSM114080	large airways, smoker 3, MAS5	212.8
GSM114081	large airways, smoker 4, MAS5	277.3
GSM114082	large airways, smoker 5, MAS5	258.6
GSM114083	large airways, smoker 6, MAS5	299.2

ACE2 and FURIN

Supplemental Figure S4. Gene ontology (GO) analyses

GO Cellular Component 2018



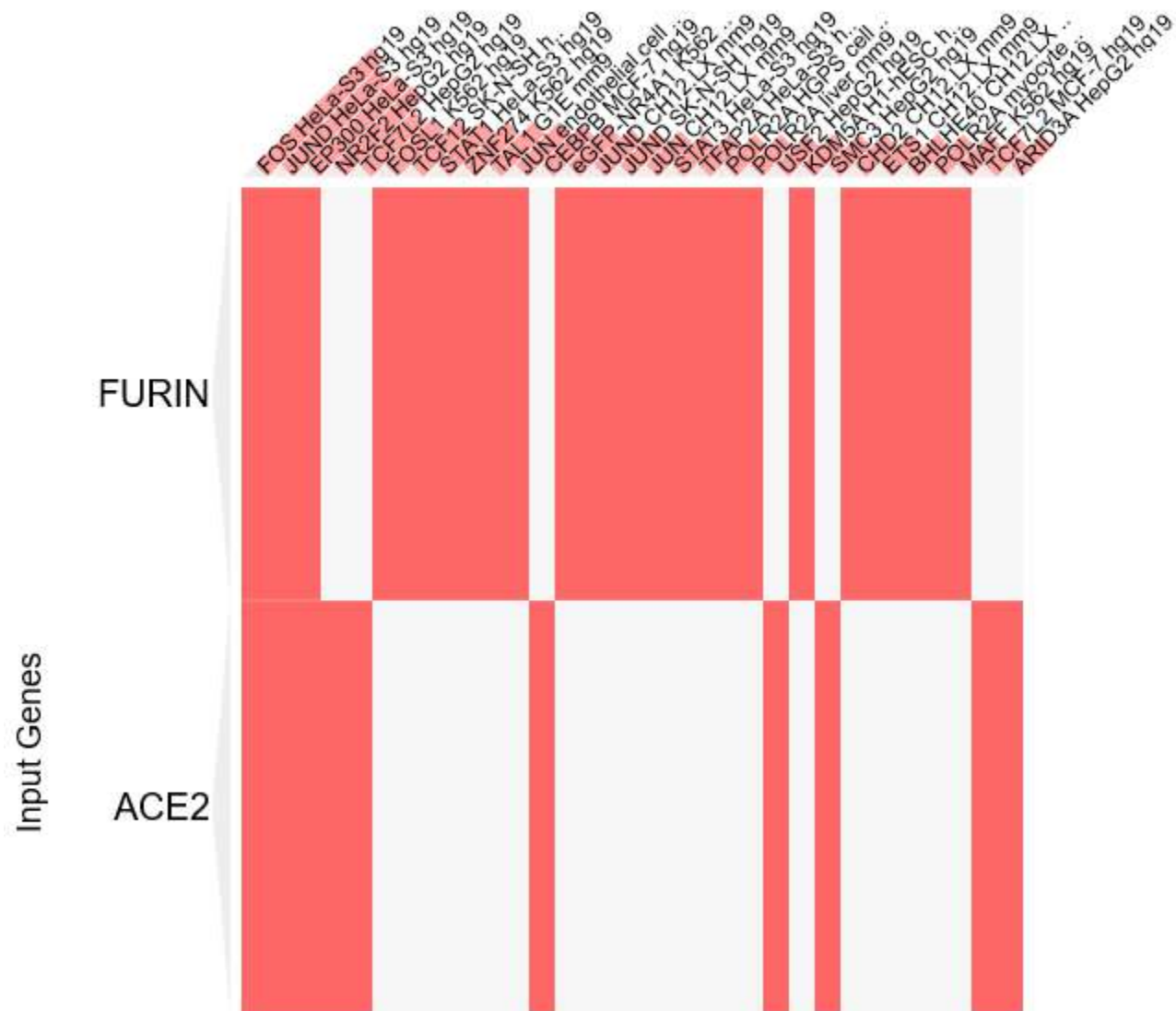
ACE2 and FURIN

Supplemental Figure S5. Potential mechanisms affecting gene expression: identifications of the enriched records of transcription factor-binding sites

Predominantly distinct transcription factors make-up chromatin of the ACE2 and FURIN genes

ENCODE TF ChIP-seq 2015

Enriched Terms



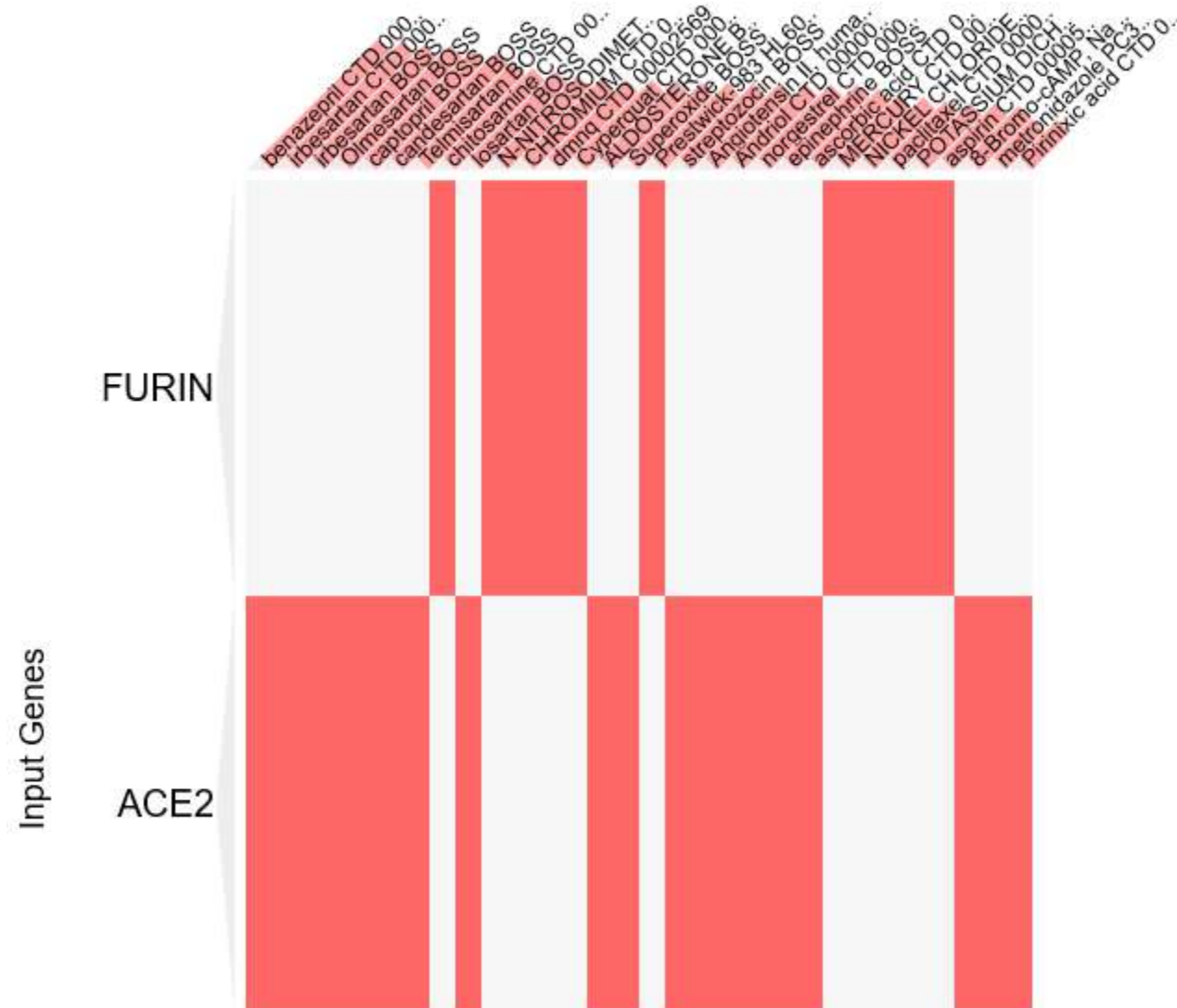
ACE2 and FURIN

Supplemental Figure S5-1. Potential mechanisms affecting gene expression: identifications of the enriched records of pathways, protein-protein interactions (PPI) hub proteins, and drugs affecting *ACE2* and *FURIN* expression

Distinct patterns of drugs affecting expression of the *ACE2* and *FURIN* genes

DSigDB

Enriched Terms

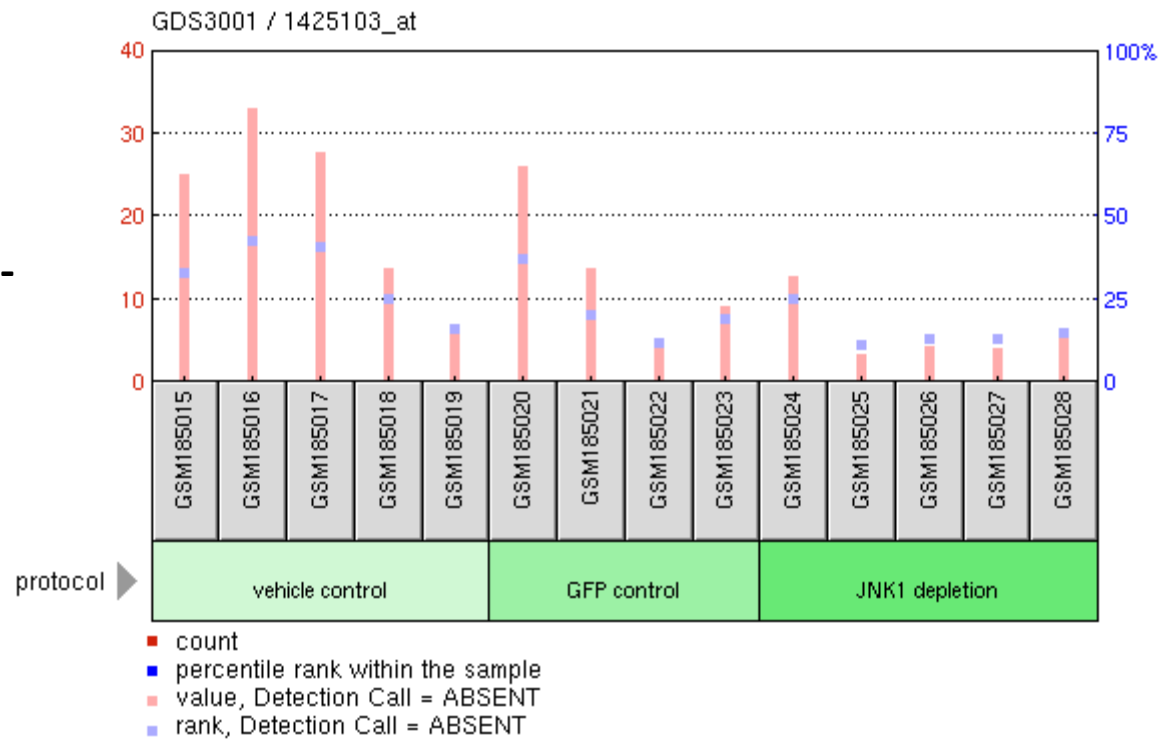


Drug Signatures Database
contains drug/gene associations
based on quantitative inhibition
and drug-induced gene expression
changes

ACE2 and FURIN

Supplemental Figure S5-2. Potential mechanisms affecting gene expression: identifications of the enriched records of transcription factor-binding sites that affect expression of target genes

Profile: ACE2 expression
GDS3001 / 1425103_at
Title
c-Jun N-terminal kinase 1
depletion effect on livers of diet-
induced obese animals
Organism
Mus musculus



JNK1 depletion is associated with decreased expression of the ACE2 gene

Sample	Title	Value
GSM185015	DIO Vehicle 1	25.1364
GSM185016	DIO Vehicle 2	33.1885
GSM185017	DIO Vehicle 3	27.7494
GSM185018	DIO Vehicle 4	13.9459
GSM185019	DIO Vehicle 5	6.24653
GSM185020	GFP Adv-shRNA 1	26.1209
GSM185021	GFP Adv-shRNA 2	13.8813
GSM185022	GFP Adv-shRNA 3	4.77496
GSM185023	GFP Adv-shRNA 5	9.28534
GSM185024	Jnk1 Adv-shRNA 1	12.9219
GSM185025	Jnk1 Adv-shRNA 2	3.46532
GSM185026	Jnk1 Adv-shRNA 3	4.42602
GSM185027	Jnk1 Adv-shRNA 4	4.17173
GSM185028	Jnk1 Adv-shRNA 5	5.42079

p < 0.05

Profile: *Fos* expression

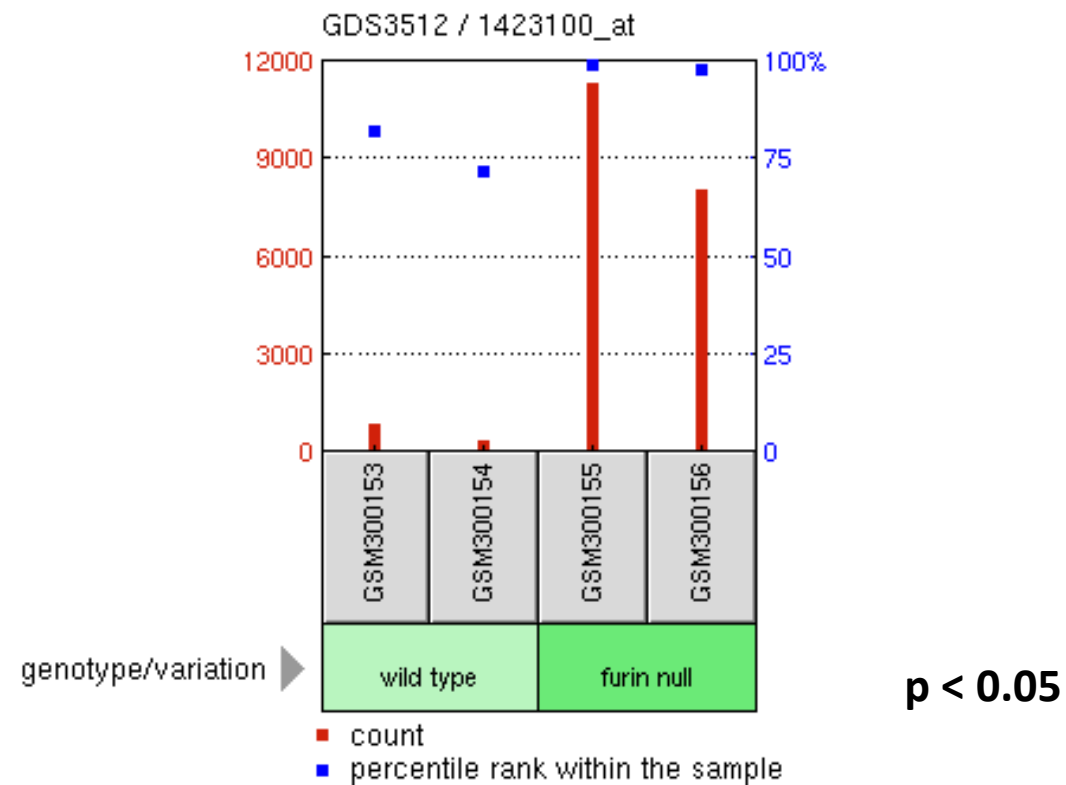
GDS3512 / 1423100_at

Title

Furin deficiency effect on T-cells

Organism

Mus musculus



***Furin* depletion is associated with increased *Fos* expression**

Sample	Title	Value
GSM300153	Naive_Furin_Wild-type_1	873.5
GSM300154	Naive_Furin_Wild-type_2	374.2
GSM300155	Naive_Furin_Knockout_1	11333.5
GSM300156	Naive_Furin_Knockout_2	8045.2

Profile: *Jun* expression

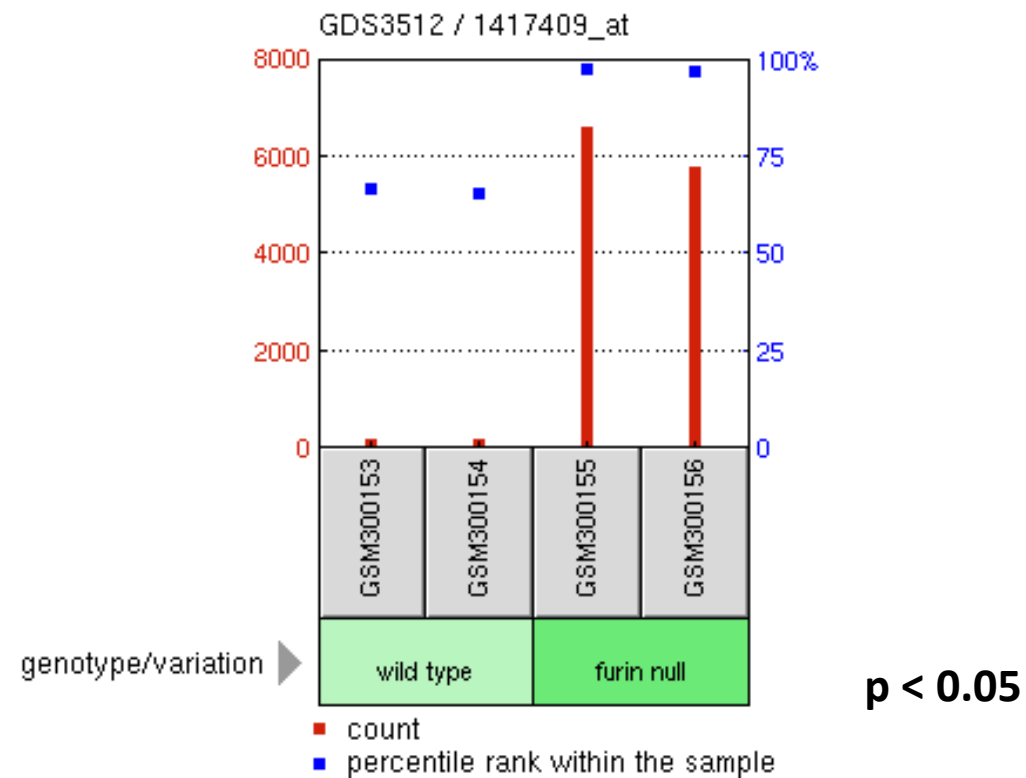
GDS3512 / 1417409_at

Title

Furin deficiency effect on T-cells

Organism

Mus musculus



***Furin* depletion is associated with increased *Jun* expression**

Sample	Title	Value
GSM300153	Naive_Furin_Wild-type_1	232.7
GSM300154	Naive_Furin_Wild-type_2	238.9
GSM300155	Naive_Furin_Knockout_1	6631.6
GSM300156	Naive_Furin_Knockout_2	5795

Profile: *Junb* expression

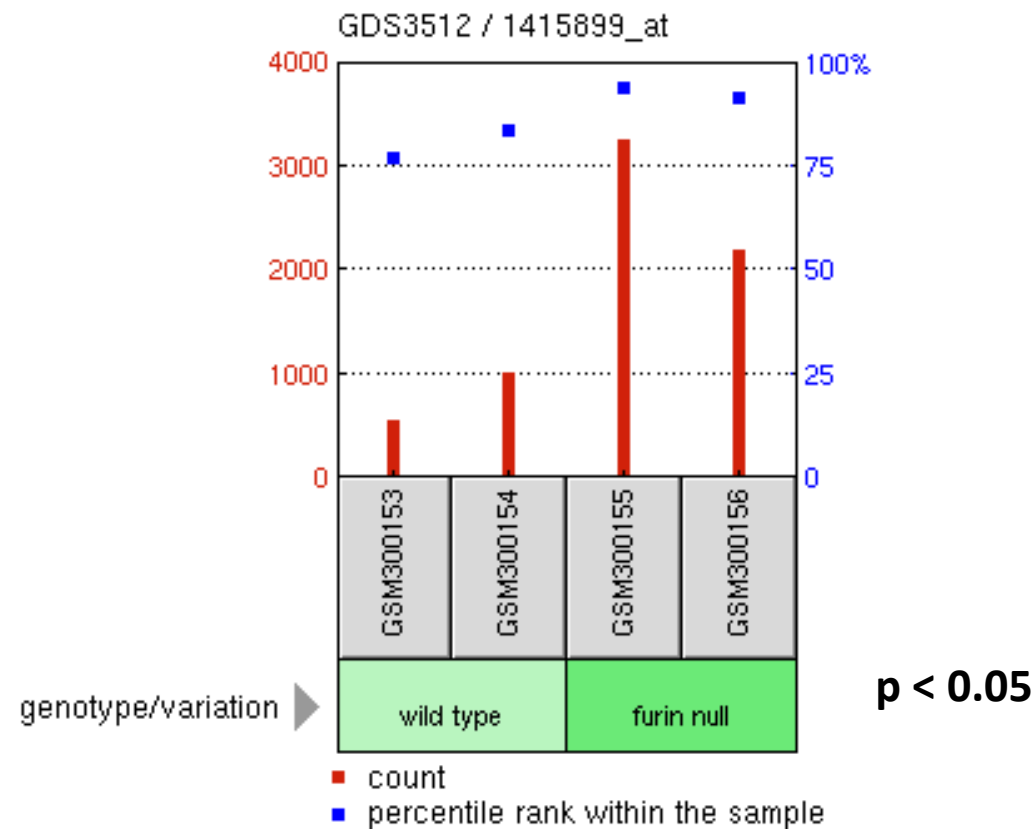
GDS3512 / 1415899_at

Title

Furin deficiency effect on T-cells

Organism

Mus musculus



***Furin* depletion is associated with increased *Junb* expression**

Sample	Title	Value
GSM300153	Naive_Furin_Wild-type_1	556
GSM300154	Naive_Furin_Wild-type_2	1032.5
GSM300155	Naive_Furin_Knockout_1	3257.8
GSM300156	Naive_Furin_Knockout_2	2203.1

Profile: *FURIN* expression

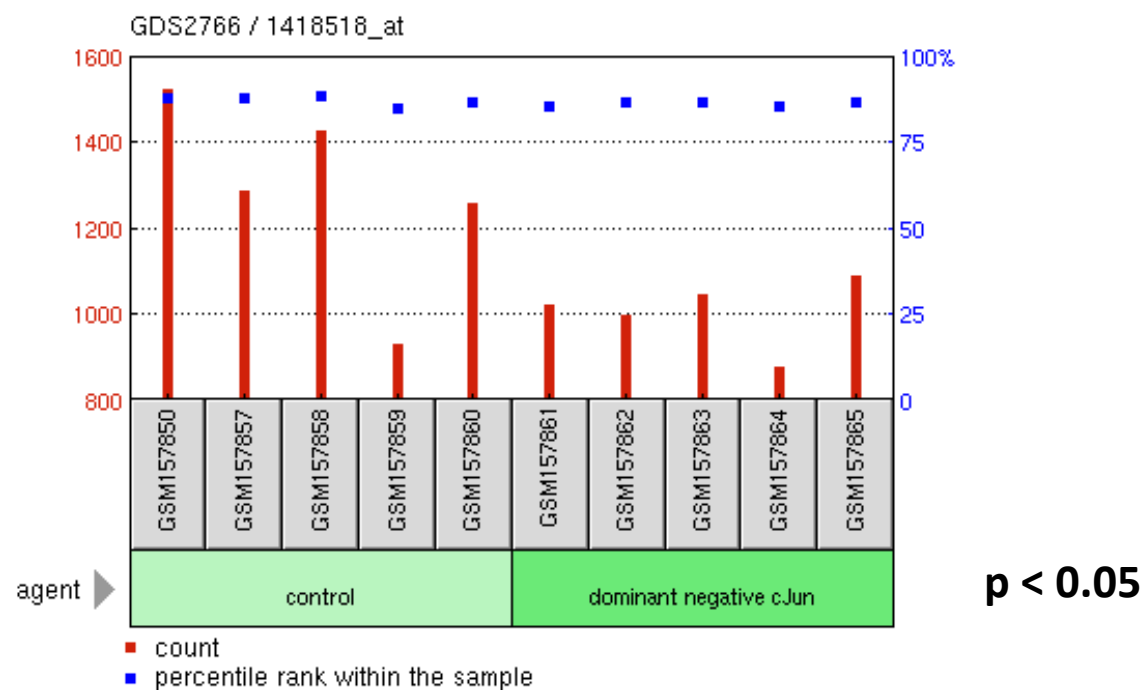
GDS2766 / 1418518_at

Title

Dominant negative cJun effect on
apolipoprotein E deficient livers

Organism

Mus musculus



cJun inhibition is associated with decreased *Furin* expression

Sample	Title	Value
GSM157850	Control VZ11	1526.31
GSM157857	Control VZ12	1290.04
GSM157858	Control VZ13	1426.9
GSM157859	Control VZ14	932.365
GSM157860	Control VZ15	1259.69
GSM157861	Dominant negative cJun VZ16	1026.16
GSM157862	Dominant negative cJun VZ17	1002.07
GSM157863	Dominant negative cJun VZ18	1049.73
GSM157864	Dominant negative cJun VZ19	879.625
GSM157865	Dominant negative cJun VZ20	1093.33

Profile: *FURIN* expression

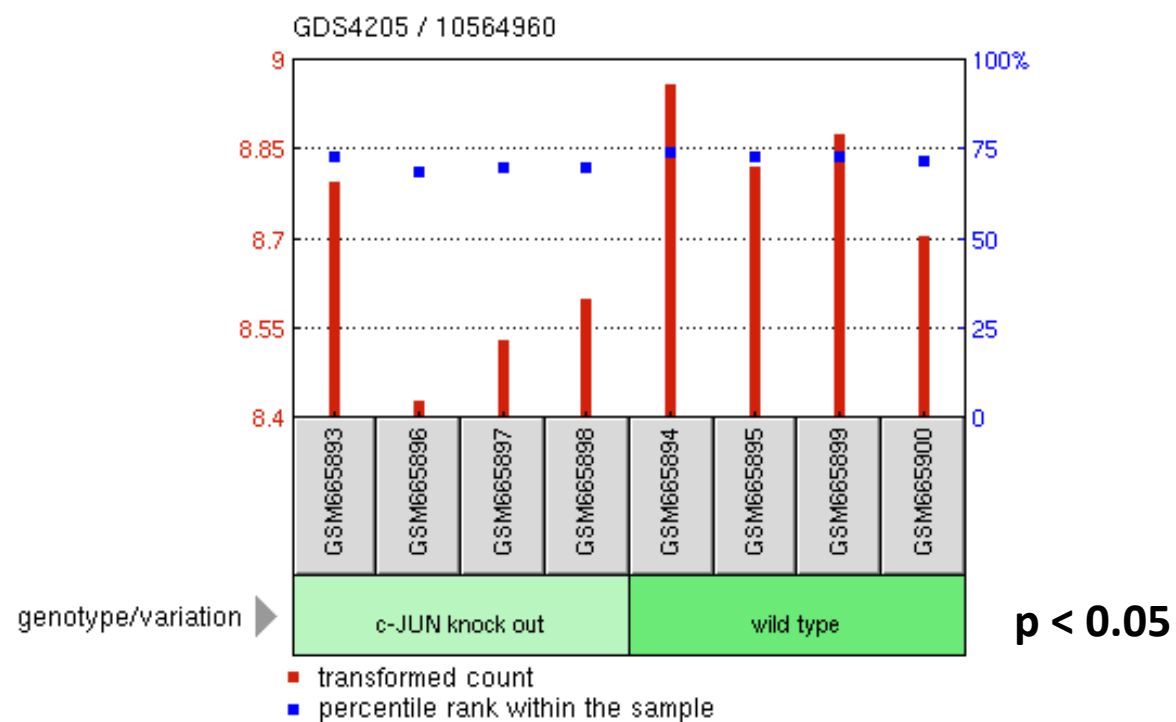
GDS4205 / 10564960

Title

Transcription factor c-JUN knockout
effect on B lymphoid cells

Organism

Mus musculus



cJun depletion is associated with decreased *Furin* expression

Sample	Title	Value
GSM665893	RO35	8.79585
GSM665896	RO38	8.42939
GSM665897	D1	8.53367
GSM665898	D6	8.60035
GSM665894	RO36	8.96016
GSM665895	RO37	8.82158
GSM665899	F2	8.87409
GSM665900	F4	8.70635

Profile: *FURIN* expression

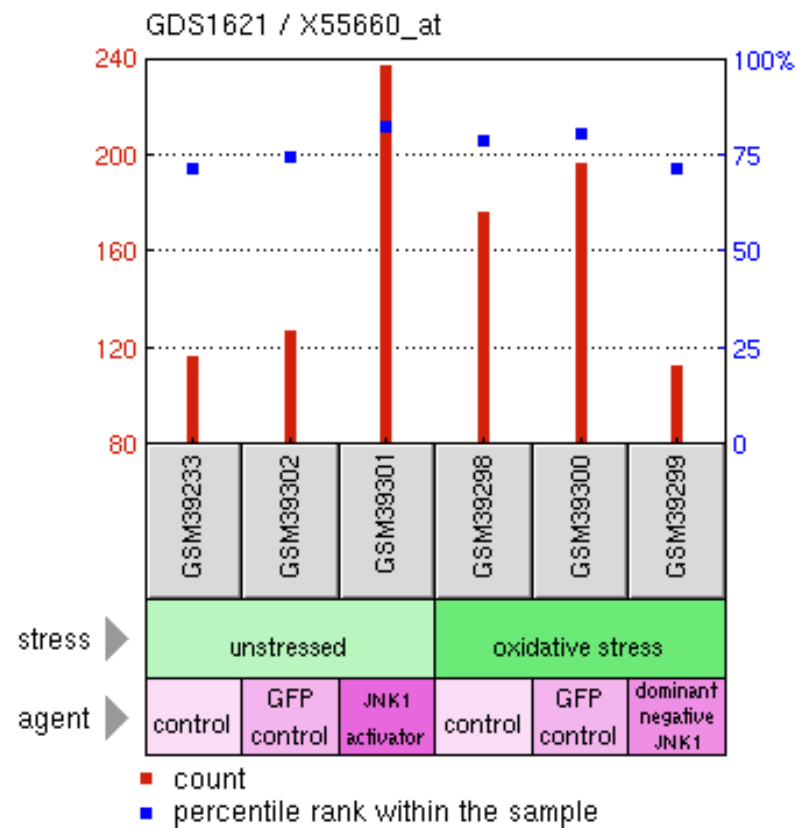
GDS1621 / X55660_at

Title

c-Jun N-terminal kinase pathway
activation and suppression effect on
aortic vascular smooth muscle cells

Organism

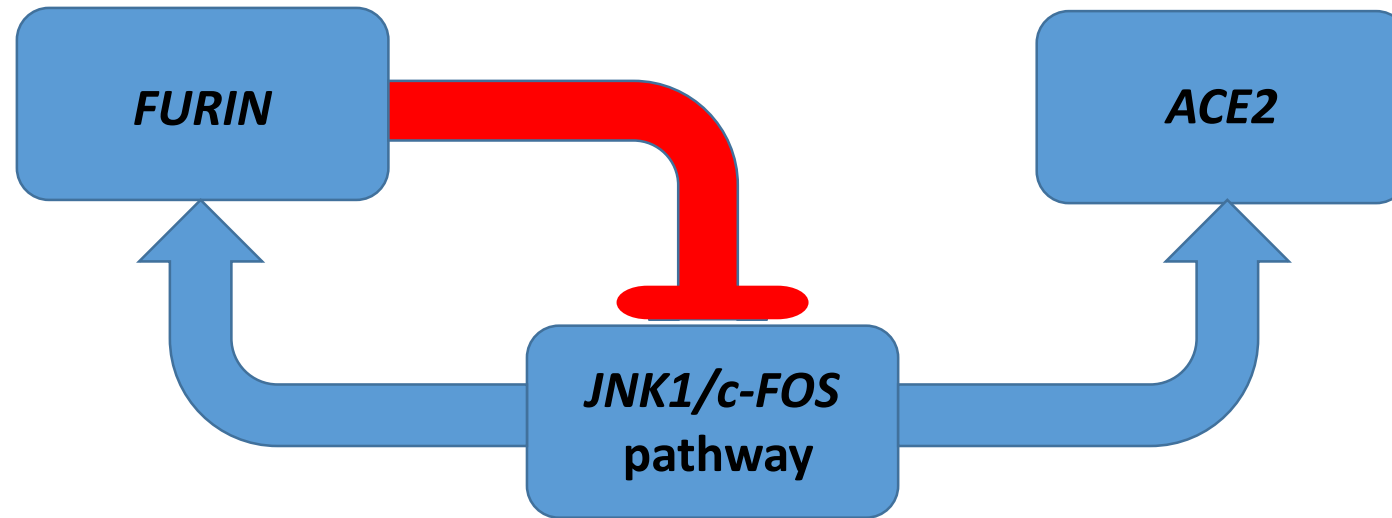
Rattus norvegicus



***JNK1* pathway inhibition is associated with decreased *Furin* expression, while *JNK1* activation is associated with increased *Furin* expression**

Sample	Title	Value
GSM39233	rVSMC_control	116.8
GSM39302	rVSMC_nEGFP	128.1
GSM39301	rVSMC_MKK7ED+JNK1WT	237.3
GSM39298	rVSMC_H2O2	177.2
GSM39300	rVSMC_H2O2+nEGFP	197.2
GSM39299	rVSMC_H2O2+APF	113.2

JNK1/c-FOS pathway-associated activation of the *ACE2* and *FURIN* expression may trigger the auto-regulatory negative feed-back loop of the *FURIN*-mediated repression of the expression of *JUN*, *JUNB*, *JUND*, and *c-FOS* genes



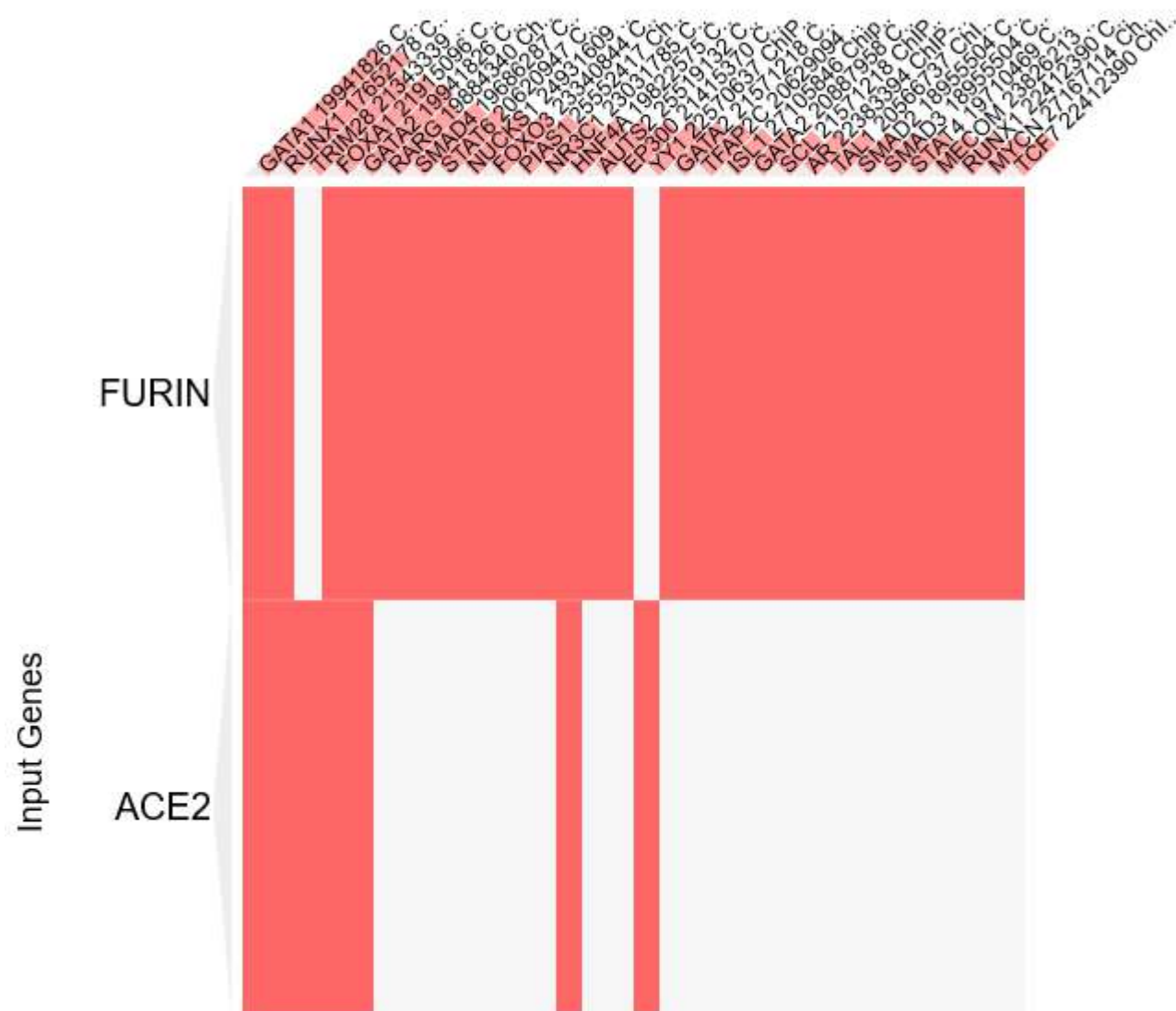
ACE2 and FURIN

Supplemental Figure S6. Potential mechanisms affecting gene expression: identifications of the enriched records of transcription factor-binding sites

Predominantly distinct transcription factors make-up chromatin of the ACE2 and FURIN genes

ChEA 2016

Enriched Terms



ACE2 and FURIN

Supplemental Figure S6-1. Potential mechanisms affecting gene expression: identifications of the enriched records of transcription factor-binding sites that affect expression of target genes

Profile: *ACE2* expression

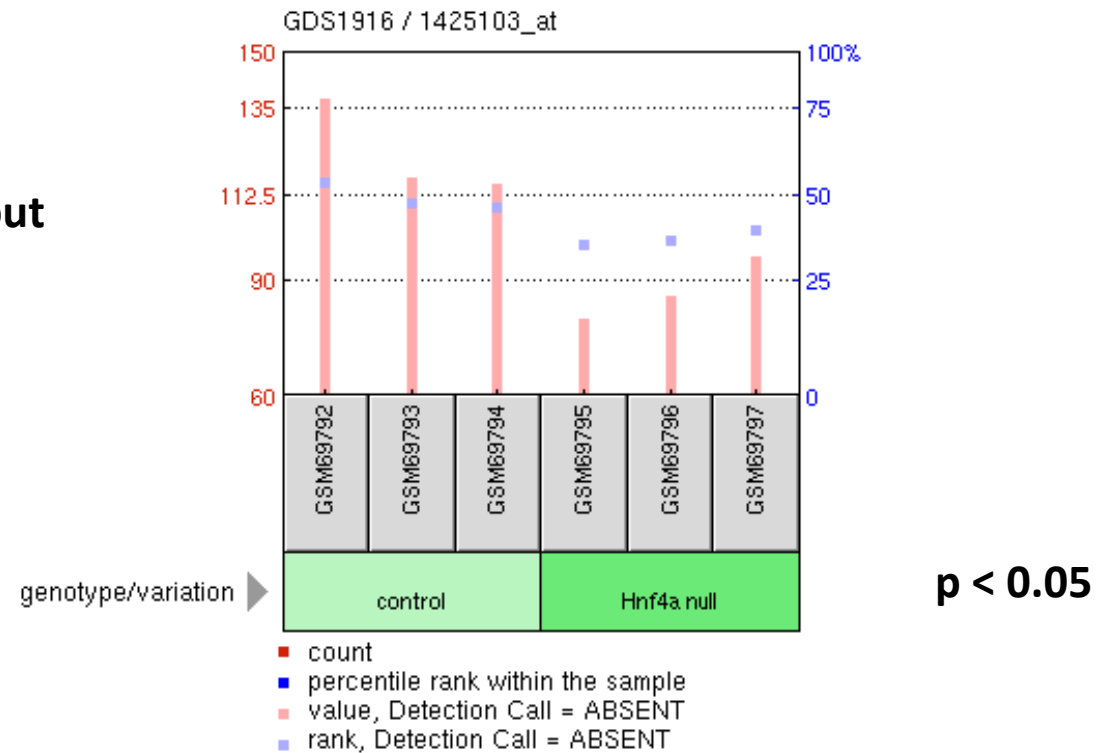
GDS1916 / 1425103_at

Title

Hepatocyte nuclear factor 4 alpha knockout
effect on the embryonic liver

Organism

Mus musculus



Hnf4a deficiency decreases *ACE2* expression in mouse cells

Sample	Title	Value
GSM69792	HNF4 Control_8	137.683
GSM69793	HNF4 Control_1192	117.056
GSM69794	HNF4 Control_1193	115.675
GSM69795	HNF4 Null_61	80.4453
GSM69796	HNF4 Null_1191	86.1111
GSM69797	HNF4 Null_1195	96.6528

Profile: ACE2 expression

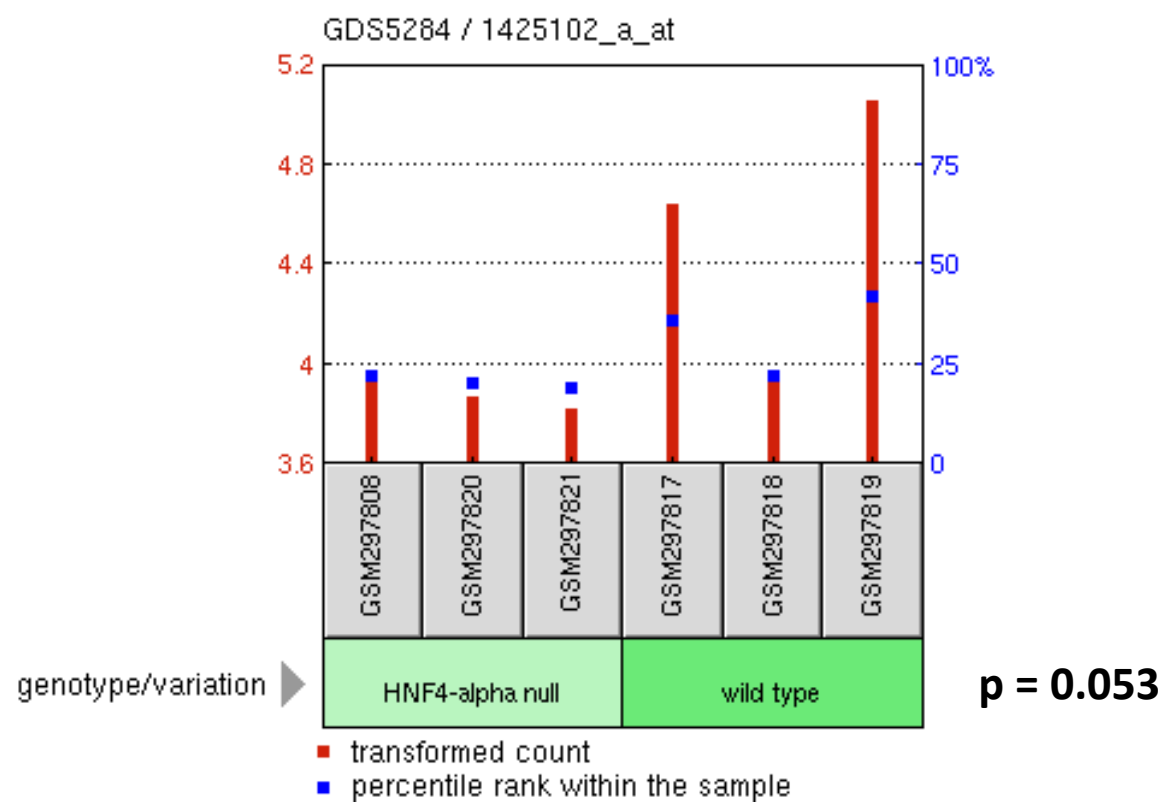
GDS5284 / 1425102_a_at

Title

Hepatocyte nuclear factor 4 alpha
deficiency effect on the colon

Organism

Mus musculus



***Hnf4a* deficiency decreases *ACE2* expression in mouse cells**

Sample	Title	Value
GSM297808	mouse colon_hnf4mutant_rep1	3.94799
GSM297820	mouse colon_hnf4mutant_rep2	3.87791
GSM297821	mouse colon_hnf4mutant_rep3	3.82229
GSM297817	mouse colon_hnf4control_rep1	4.64383
GSM297818	mouse colon_hnf4control_rep2	3.9605
GSM297819	mouse colon_hnf4control_rep3	5.05635

Profile: *Furin* expression

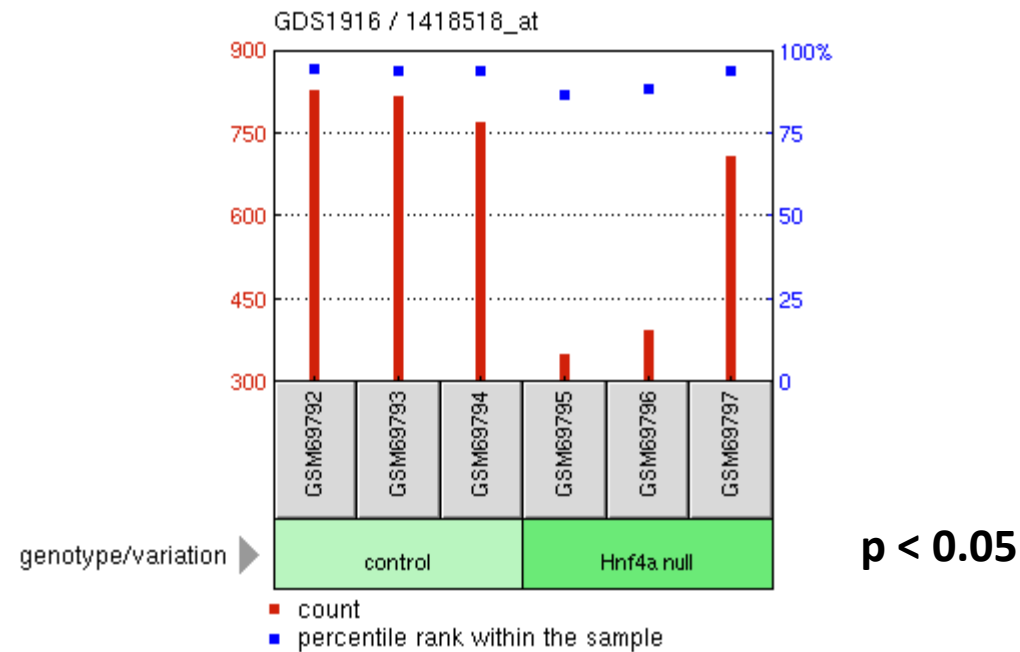
GDS1916 / 1418518_at

Title

Hepatocyte nuclear factor 4 alpha
knockout effect on the embryonic liver

Organism

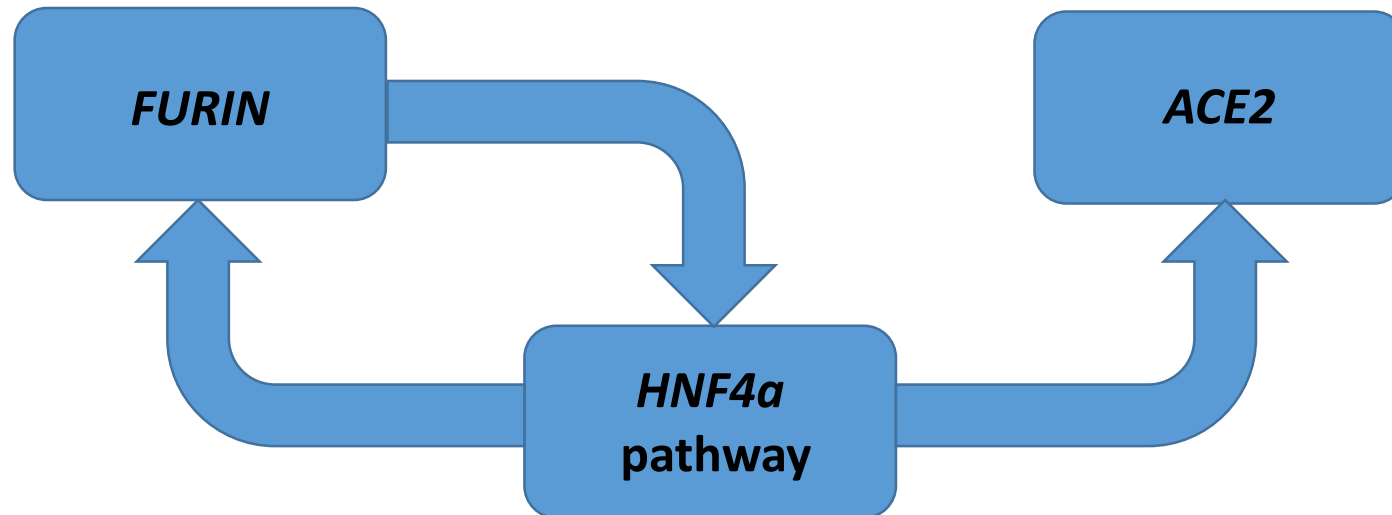
Mus musculus



Hnf4a deficiency decreases *Furin* expression in murine cells

Sample	Title	Value
GSM69792	HNF4 Control_8	828.42
GSM69793	HNF4 Control_1192	820.313
GSM69794	HNF4 Control_1193	772.082
GSM69795	HNF4 Null_61	354.031
GSM69796	HNF4 Null_1191	396.723
GSM69797	HNF4 Null_1195	708.976

HNF4a pathway-associated activation of the *ACE2* and *FURIN* expression may trigger the auto-regulatory positive feed-back loop of the *FURIN*-mediated activation of the *HNF4a* expression



Profile: ACE2 expression

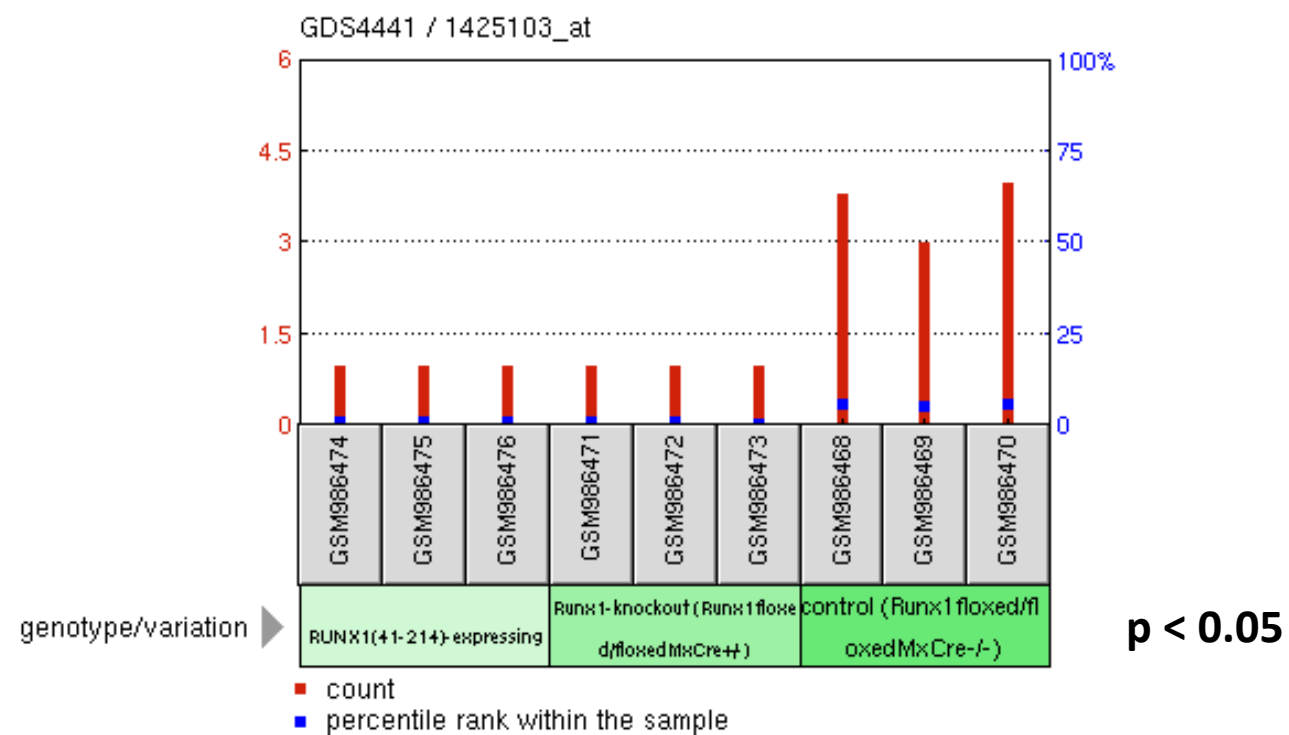
GDS4441 / 1425103_at

Title

Runx1 homology domain expression
effect on hematopoietic stem cells

Organism

Mus musculus



Runx1 deficiency decreases ACE2 expression in mouse cells

Sample	Title	Value	
GSM986474	RUNX1(41-214), biological replicate 1	1	
GSM986475	RUNX1(41-214), biological replicate 2	1	
GSM986476	RUNX1(41-214), biological replicate 3	1	
GSM986471	Runx1KO, biological replicate 1	1	
GSM986472	Runx1KO, biological replicate 2	1	
GSM986473	Runx1KO, biological replicate 3	1	
GSM986468	Control, biological replicate 1	3.83	$p < 0.05$
GSM986469	Control, biological replicate 2	3	
GSM986470	Control, biological replicate 3	4	

Profile: *FURIN* expression

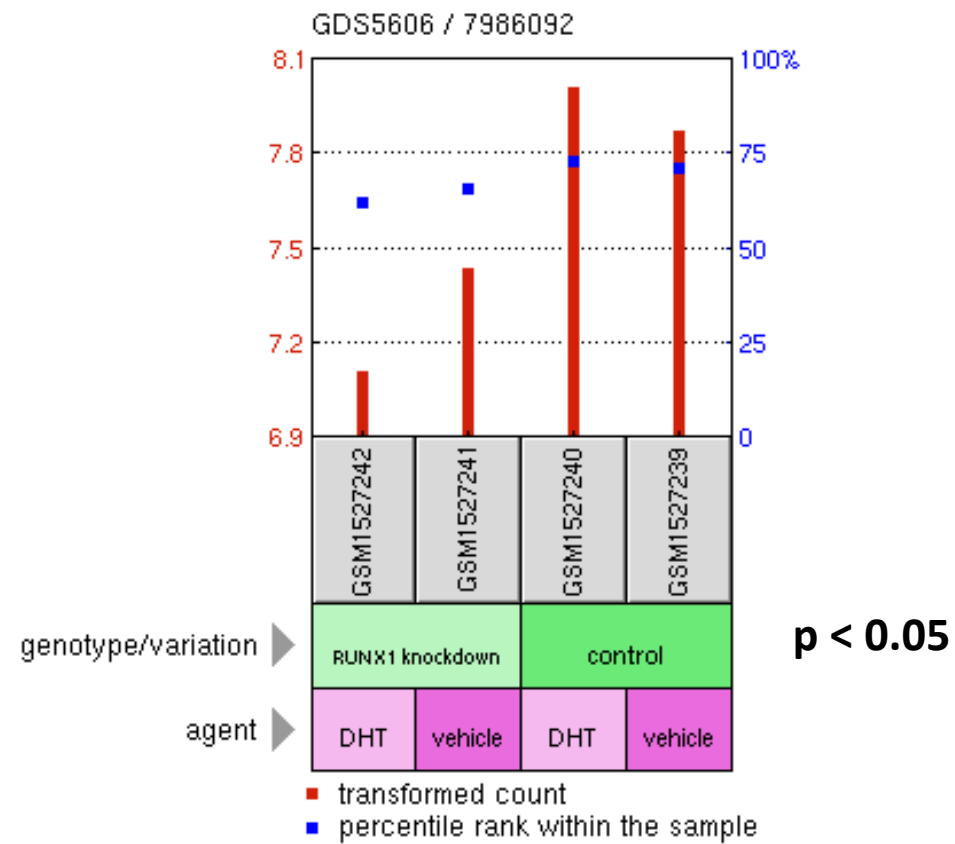
GDS5606 / 7986092

Title

Androgen effect on runt-related transcription factor 1-deficient prostate cancer cell line

Organism

Homo sapiens



***RUNX1* deficiency decreases *FURIN* expression in human cells**

Sample	Title	Value
GSM1527242	LNCaP_siRUNX1_DHT	7.11175
GSM1527241	LNCaP_siRUNX1_Veh	7.43782
GSM1527240	LNCaP_siControl_DHT	8.00649
GSM1527239	LNCaP_siControl_Veh	7.87368

Profile: *Runx1* expression

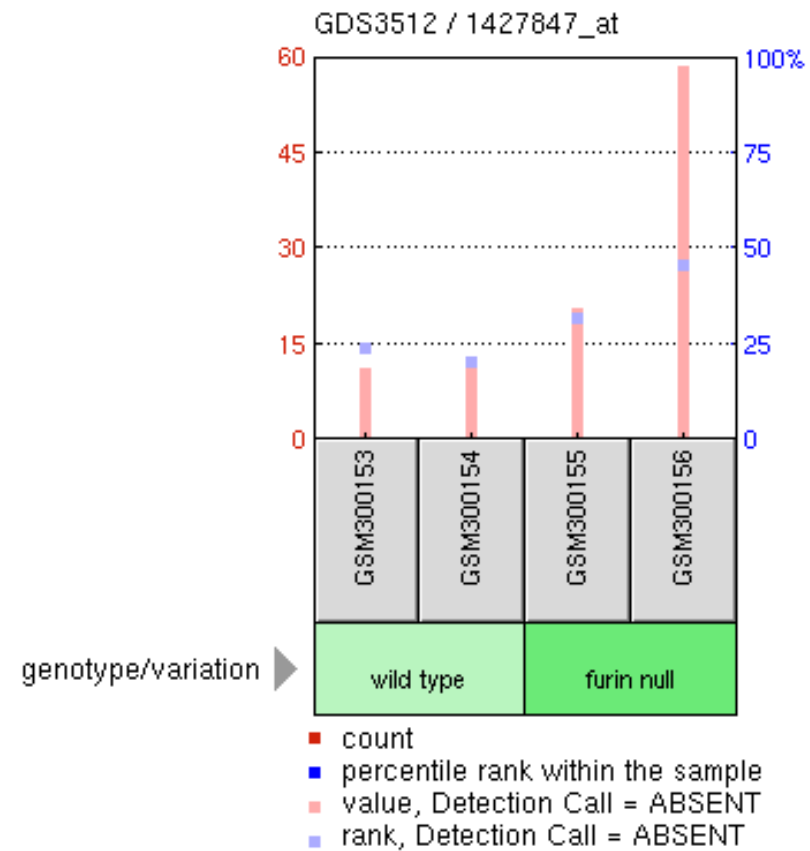
GDS3512 / 1427847_at

Title

Furin deficiency effect on T-cells

Organism

Mus musculus



Furin deficiency enhances *Runx1* expression in murine T-cells

Sample	Title	Value
GSM300153	Naive_Furin_Wild-type_1	11.5
GSM300154	Naive_Furin_Wild-type_2	12.5
GSM300155	Naive_Furin_Knockout_1	20.9
GSM300156	Naive_Furin_Knockout_2	58.7

Profile: *Foxa1* expression

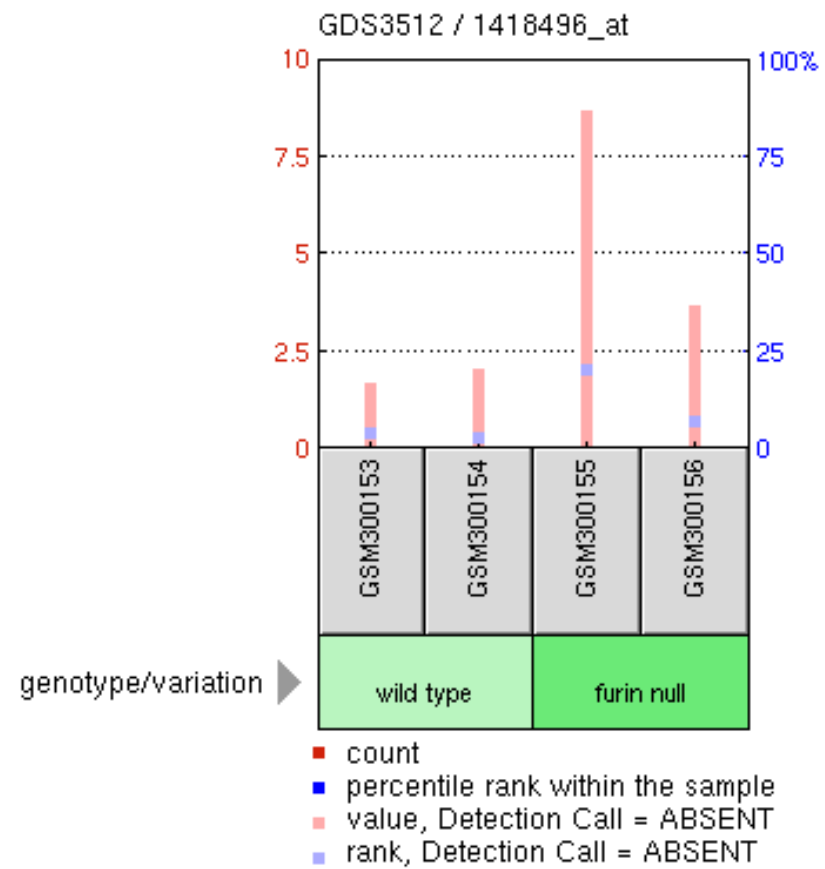
GDS3512 / 1418496_at

Title

Furin deficiency effect on T-cells

Organism

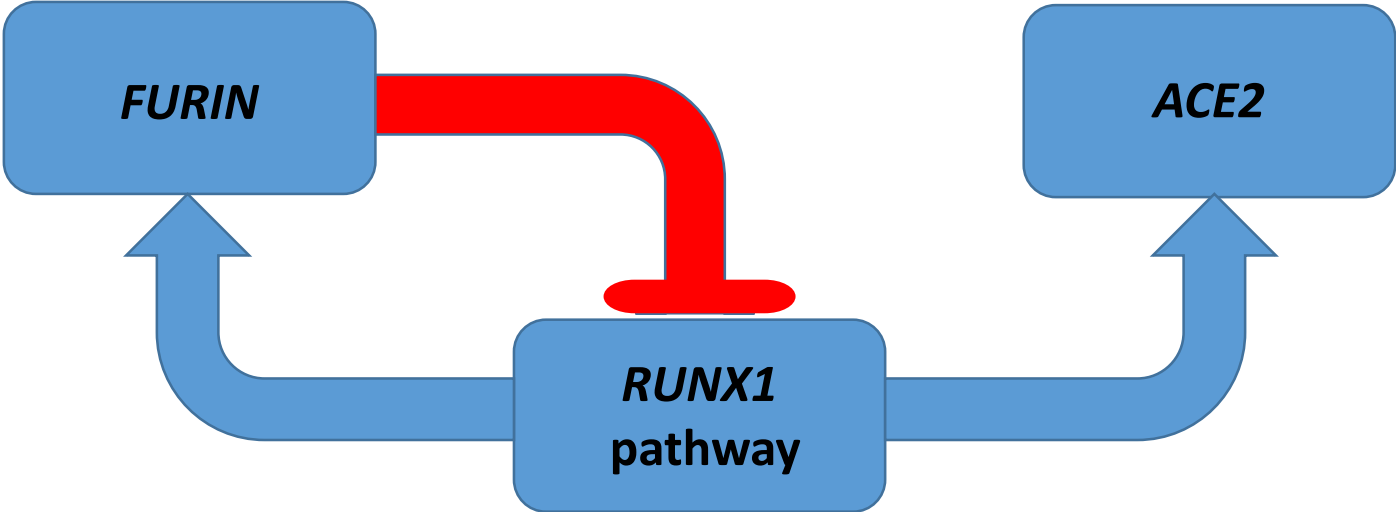
Mus musculus



***Furin* deficiency enhances *Foxa1* expression in murine T-cells**

Sample	Title	Value
GSM300153	Naive_Furin_Wild-type_1	1.7
GSM300154	Naive_Furin_Wild-type_2	2.1
GSM300155	Naive_Furin_Knockout_1	8.7
GSM300156	Naive_Furin_Knockout_2	3.7

RUNX1 pathway-associated activation of the *ACE2* and *FURIN* expression may trigger the auto-regulatory negative feed-back loop of the *FURIN*-mediated repression of the *RUNX1* gene expression



ACE2 and FURIN

Supplemental Figure S7. Potential mechanisms affecting gene expression: Putative inhibitory role of the *VDR* gene and Vitamin D

ARCHS4 TFs Co-expression

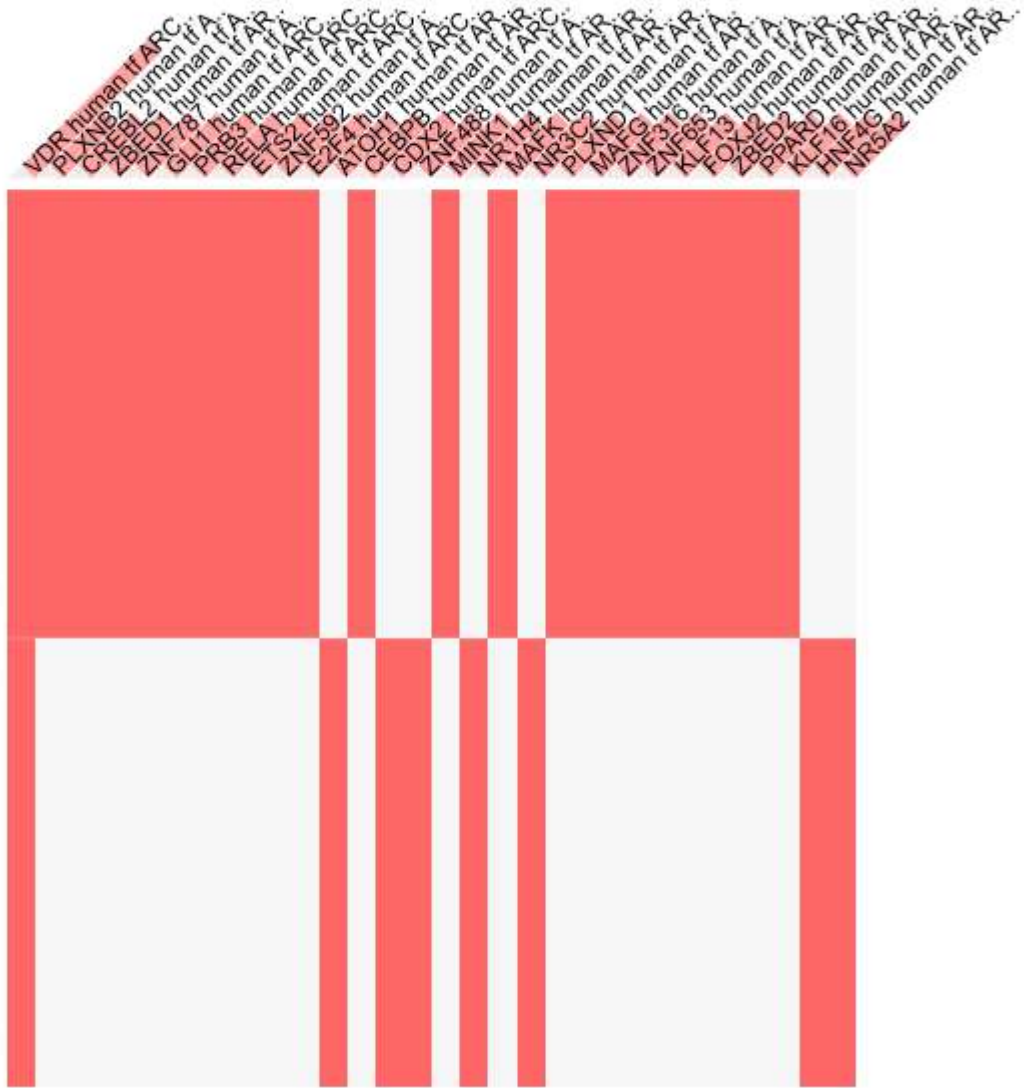
Enriched Terms

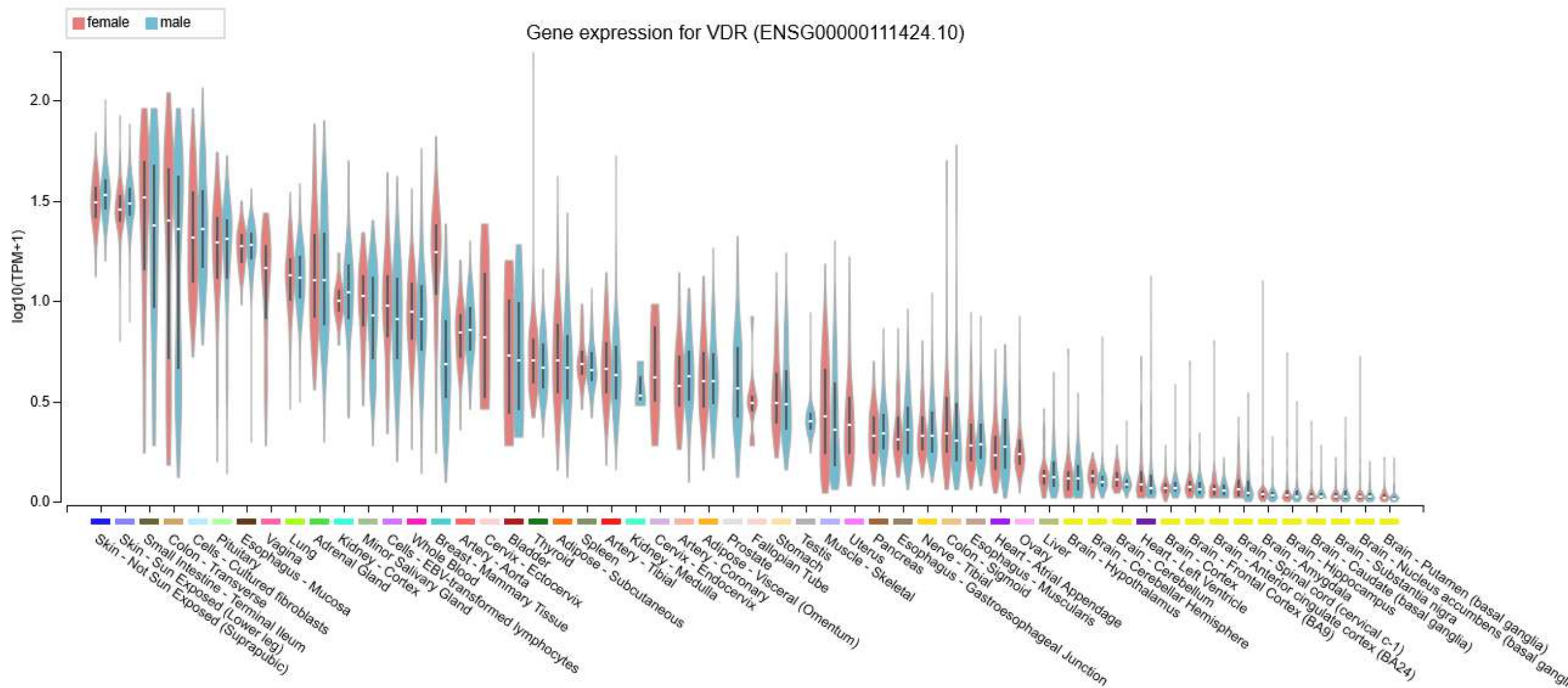
- VDR human tf ARCHS4 coexpression
- KLF13 human tf ARCHS4 coexpression
- ZNF653 human tf ARCHS4 coexpression
- ZNF316 human tf ARCHS4 coexpression
- MAFG human tf ARCHS4 coexpression
- PLXND1 human tf ARCHS4 coexpression
- NR3C2 human tf ARCHS4 coexpression
- MAFK human tf ARCHS4 coexpression
- NR1H4 human tf ARCHS4 coexpression
- MINK1 human tf ARCHS4 coexpression

Input Genes

FURIN

ACE2





ACE2 and FURIN

Supplemental Figure S7-1. Potential mechanisms affecting gene expression: Putative inhibitory role of the *VDR* gene and Vitamin D revealed by gene expression profiles in the GEO data sets

Profile: **ACE2 expression**

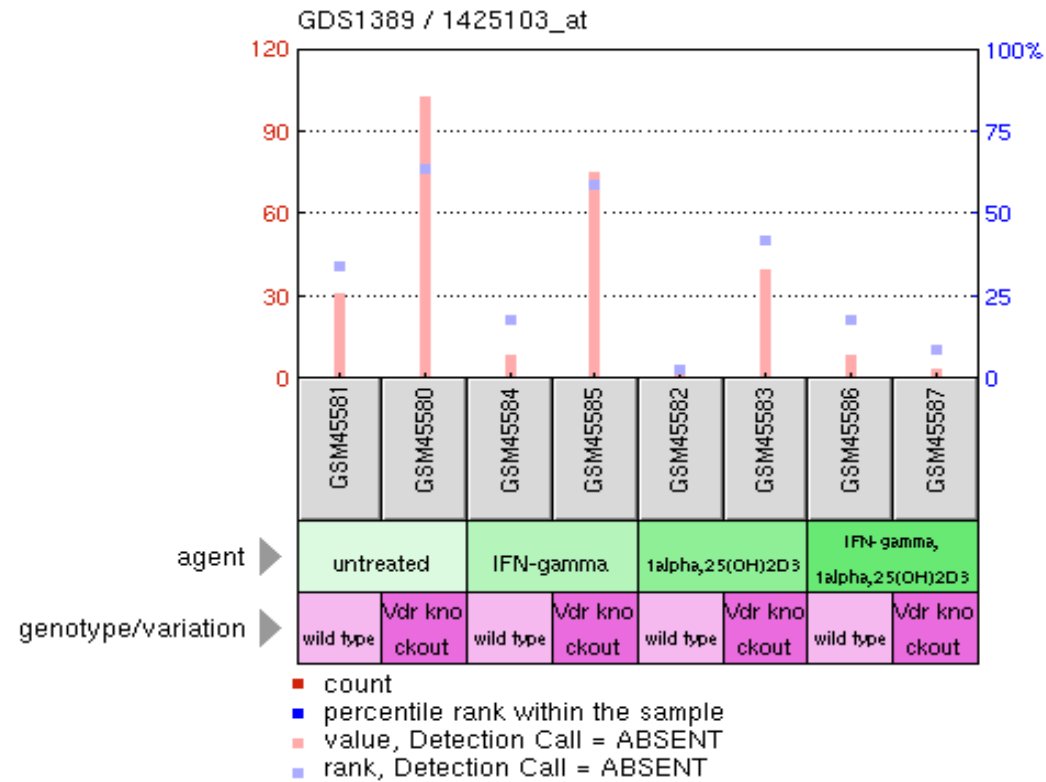
GDS1389 / 1425103_at

Title

**1alpha,25-dihydroxyvitamin D3
suppressive effect on IFN-gamma
activated macrophages**

Organism

Mus musculus



VDR depletion increases ACE2 expression

Sample	Title	Value
GSM45581	0-WT	31.4
GSM45580	0-KO	102.7
GSM45584	IFN-WT	9.1
GSM45585	IFN-KO	75.7
GSM45582	Vit-WT	3.8
GSM45583	Vit-KO	40.2
GSM45586	IFN/Vit-WT	9
GSM45587	IFN/Vit-KO	4.1

***VDR*: a candidate inhibitor of the *ACE2* expression**

GEO profile	GDS1389 / 1452138_a_at	GDS1389 / 1452138_a_at	GDS1389 / 1425103_at	GDS1389 / 1425103_at
Sample	GSM45581	GSM45580	GSM45581	GSM45580
Genotype	VDR-WT	VDR-KO	VDR-WT	VDR-KO
Expression value	27.4	59.8	31.4	102.7

GEO Profile: *ACE2* expression

GDS1389 / 1425103_at & 1452138_a_at

Title

**1alpha,25-dihydroxyvitamin D3 suppressive effect on IFN-gamma
activated macrophages**

Organism

Mus musculus

Profile: ACE2 expression

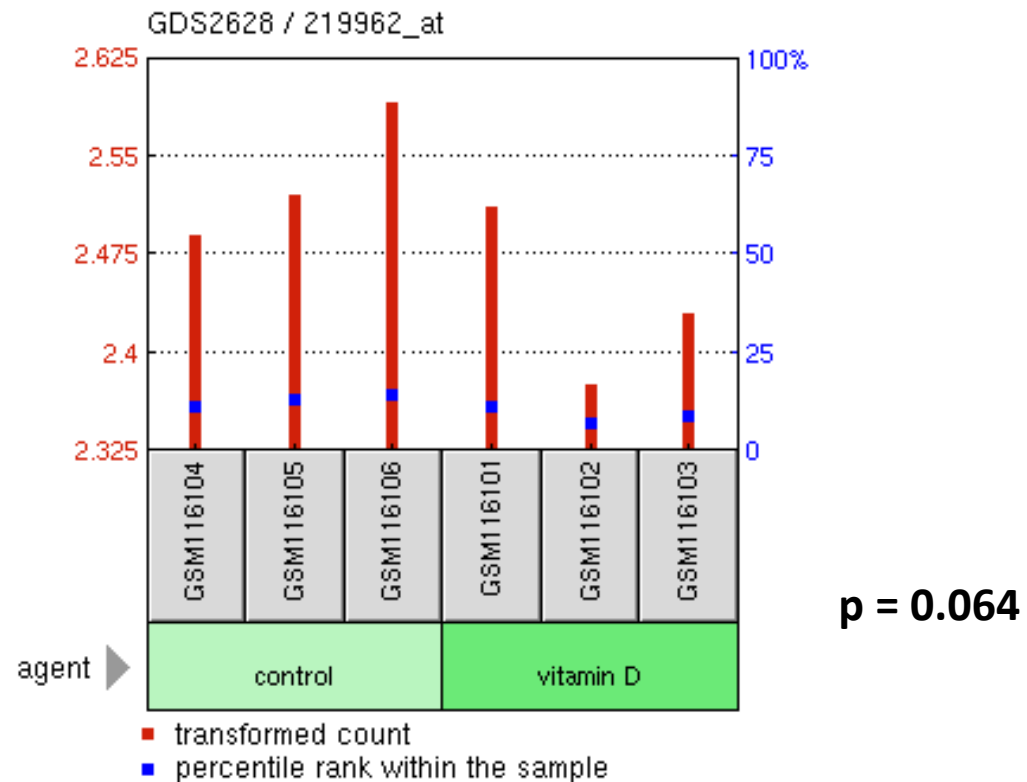
GDS2628 / 219962_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

Homo sapiens



Vitamin D effect on ACE2 expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	2.49036
GSM116105	hBSMC_control_rep2	2.52156
GSM116106	hBSMC_control_rep3	2.59211
GSM116101	hBSMC_vitamin D_rep1	2.51261
GSM116102	hBSMC_vitamin D_rep2	2.37673
GSM116103	hBSMC_vitamin D_rep3	2.43005

Direct and reciprocal effects of the *VDR* gene and Vitamin D administration on expression of the *JNK1/c-FOS* pathway genes

Profile: *VDR* expression

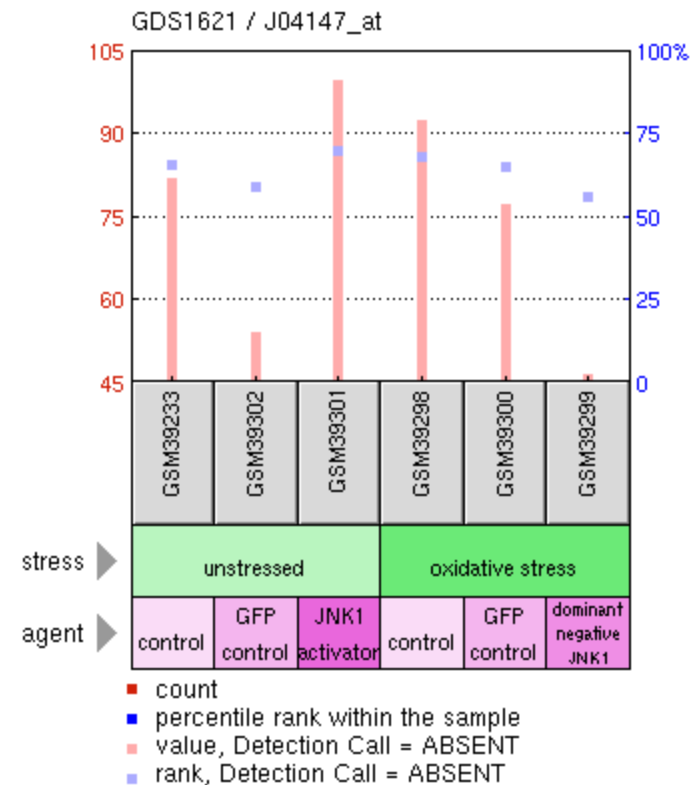
GDS1621 / J04147_at

Title

c-Jun N-terminal kinase pathway
activation and suppression effect on
aortic vascular smooth muscle cells

Organism

Rattus norvegicus



***JNK1* pathway inhibition is associated with decreased *VDR* expression, while *JNK1* activation is associated with increased *VDR* expression**

Sample	Title	Value
GSM39233	rVSMC_control	82
GSM39302	rVSMC_nEGFP	54.3
GSM39301	rVSMC_MKK7ED+JNK1WT	99.8
GSM39298	rVSMC_H2O2	92.7
GSM39300	rVSMC_H2O2+nEGFP	77.3
GSM39299	rVSMC_H2O2+APF	45.7

Profile: *c-JUN* expression

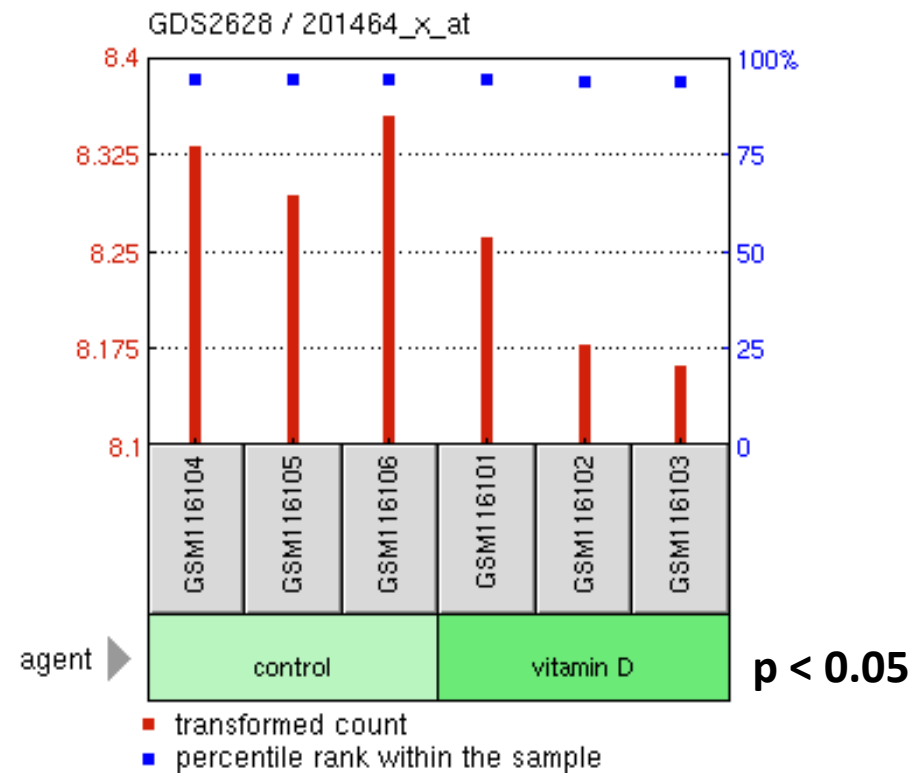
GDS2628 / 201464_x_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

Homo sapiens



Vitamin D inhibits *c-JUN* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	8.33308
GSM116105	hBSMC_control_rep2	8.29401
GSM116106	hBSMC_control_rep3	8.35545
GSM116101	hBSMC_vitamin D_rep1	8.26197
GSM116102	hBSMC_vitamin D_rep2	8.17801
GSM116103	hBSMC_vitamin D_rep3	8.16188

Profile: *c-FOS* expression

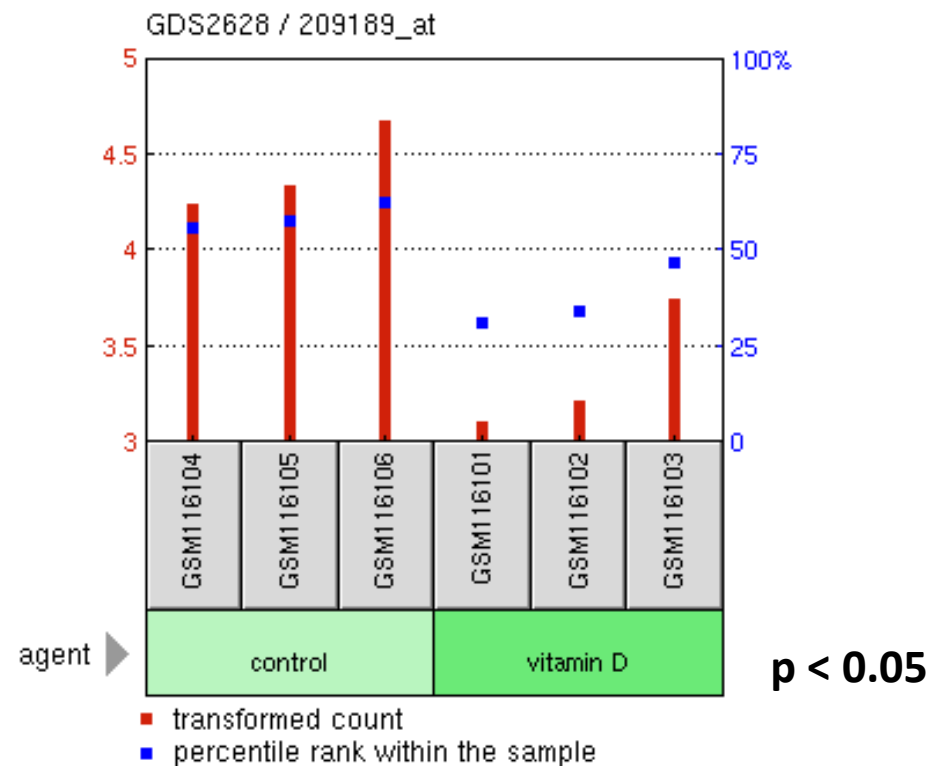
GDS2628 / 209189_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

Homo sapiens



Vitamin D inhibits *c-FOS* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	4.24348
GSM116105	hBSMC_control_rep2	4.34194
GSM116106	hBSMC_control_rep3	4.67701
GSM116101	hBSMC_vitamin D_rep1	3.11013
GSM116102	hBSMC_vitamin D_rep2	3.21701
GSM116103	hBSMC_vitamin D_rep3	3.75394

Profile: **VDR expression**

GDS766 / 99964_at

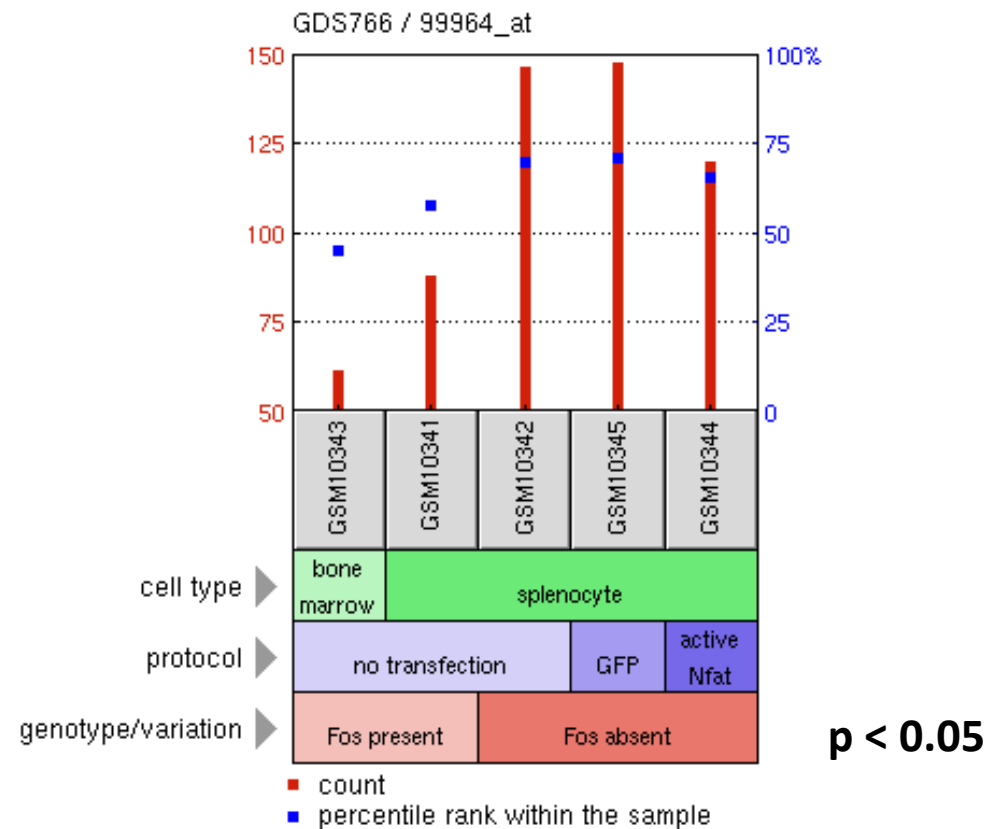
Title

Osteoclastogenesis regulation by c-Fos and

Nfat

Organism

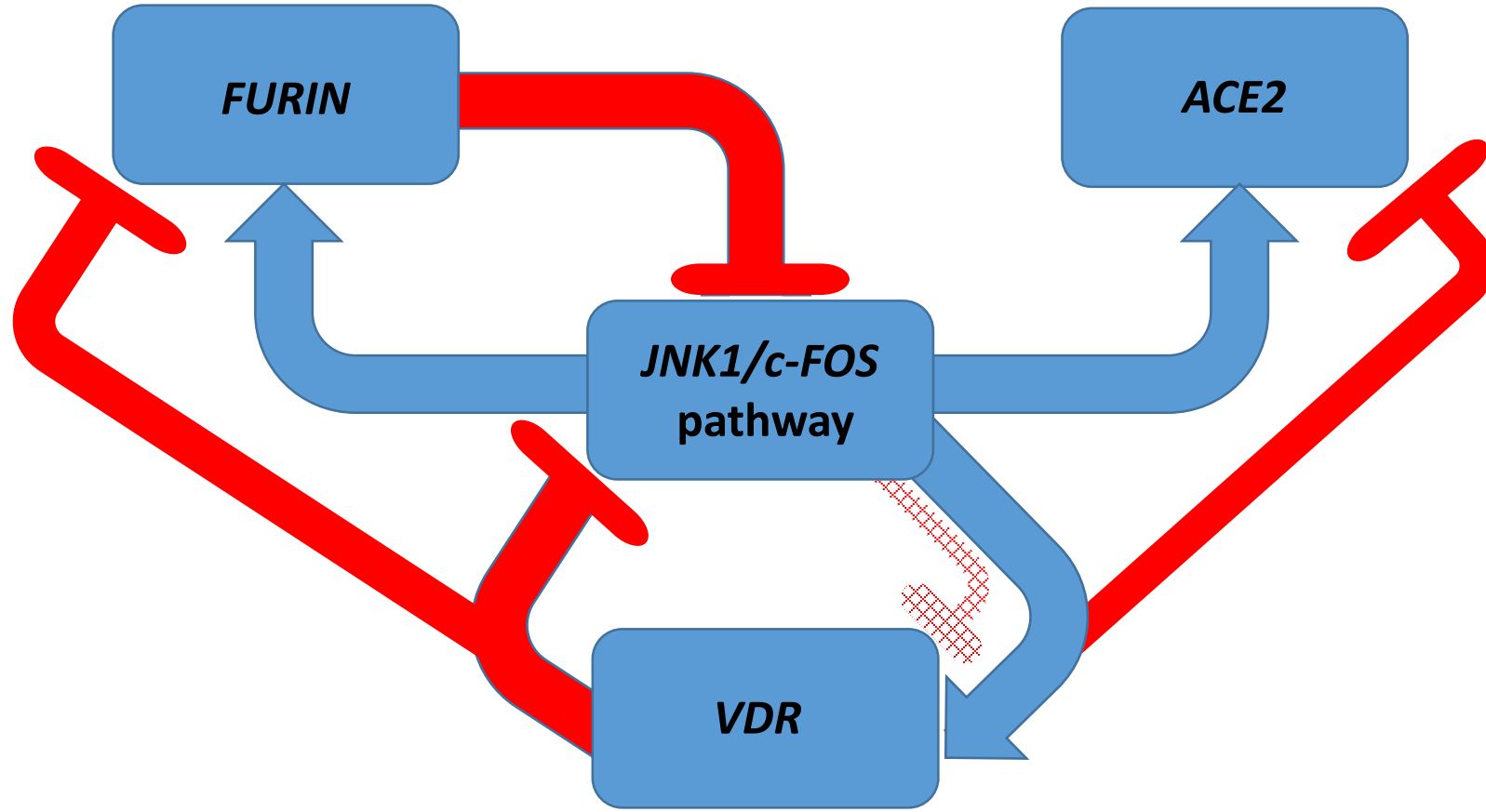
Mus musculus



***c-Fos* inhibits *Vdr* expression**

Sample	Title	Value
GSM10343	Fos+/+ bone-marrow	61.7
GSM10341	Fos+/+ splenocytes	88
GSM10342	Fos-/- splenocytes	146.8
GSM10345	Fos-/- splenocytes expressing GFP	147.6
GSM10344	Fos-/- splenocytes expressing deltaNFAT	120.3

JNK1/c-FOS pathway-associated activation of the *ACE2* and *FURIN* expression may trigger the auto-regulatory negative feed-back loop of the *FURIN*-mediated repression of the expression of *JUN*, *JUNB*, *JUND*, and *c-FOS* genes



Direct and reciprocal effects of the *VDR* gene and Vitamin D administration on expression of the *HNF4a* gene

Profile: *VDR* expression

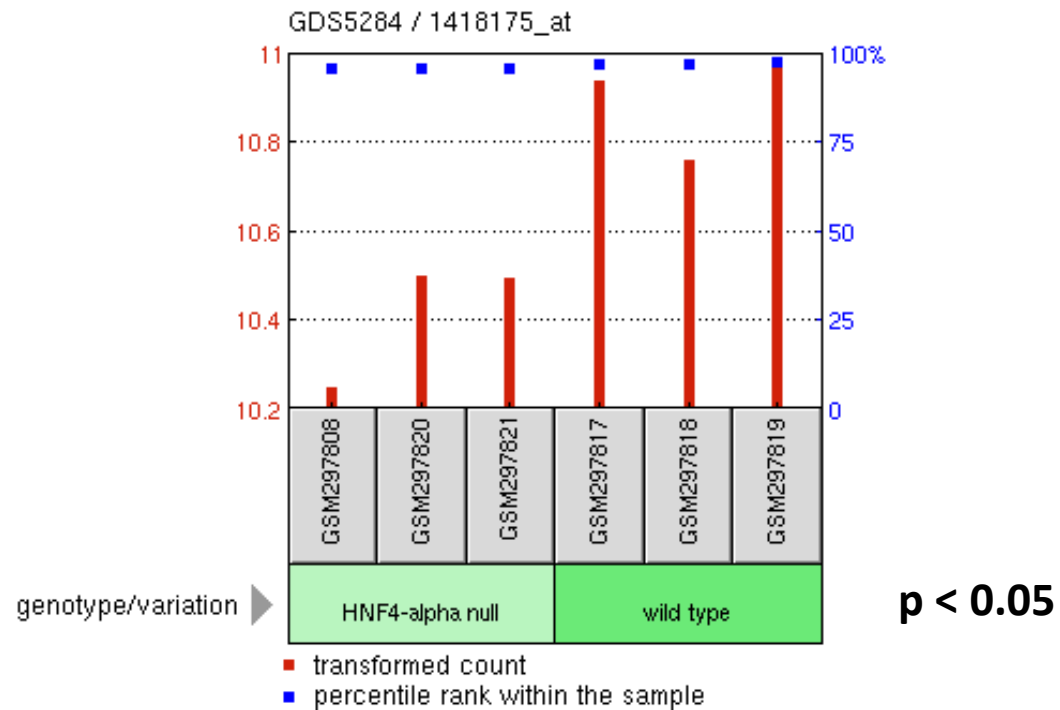
GDS5284 / 1418175_at

Title

Hepatocyte nuclear factor 4 alpha
deficiency effect on the colon

Organism

Mus musculus



HNF4a depletion inhibits *VDR* expression

Sample	Title	Value
GSM297808	mouse colon_hnf4mutant_rep1	10.2483
GSM297820	mouse colon_hnf4mutant_rep2	10.4994
GSM297821	mouse colon_hnf4mutant_rep3	10.4987
GSM297817	mouse colon_hnf4control_rep1	10.9398
GSM297818	mouse colon_hnf4control_rep2	10.7599
GSM297819	mouse colon_hnf4control_rep3	10.9741

Profile: **VDR expression**

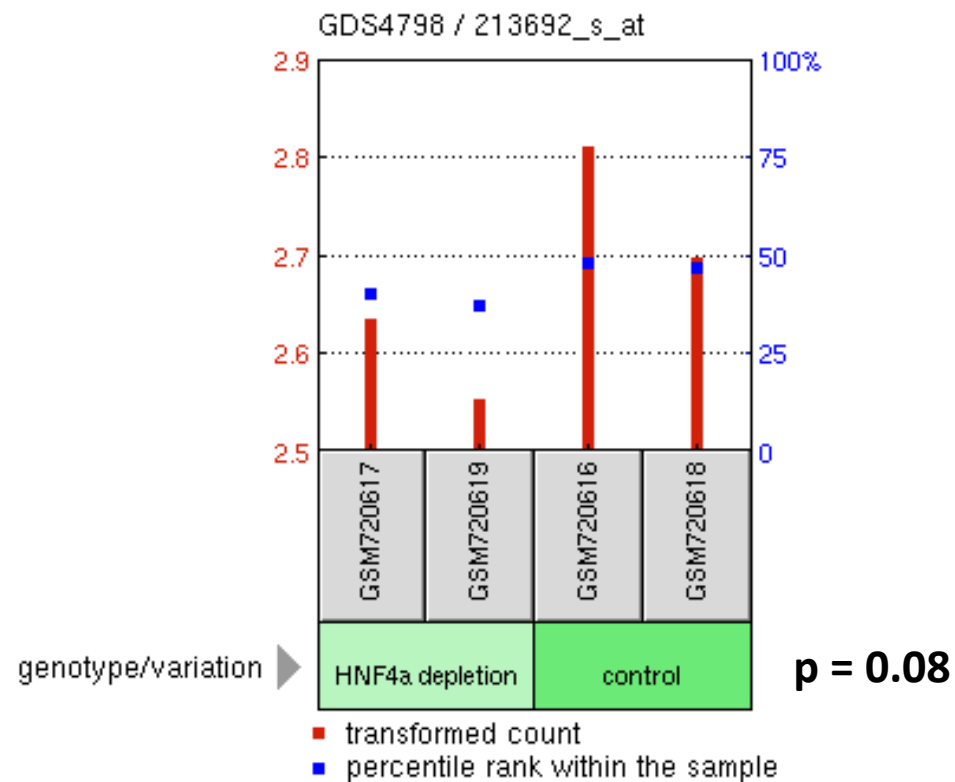
GDS4798 / 213692_s_at

Title

**Hepatocyte nuclear factor 4 alpha depletion
effect on hepatocellular carcinoma cell line**

Organism

Homo sapiens



***HNF4a* depletion inhibits *VDR* expression**

Sample	Title	Value
GSM720617	HepG2 cells, HNF4a RNAi treated, rep1	2.63638
GSM720619	HepG2 cells, HNF4a RNAi treated, rep2	2.5545
GSM720616	HepG2 cells, control, rep1	2.81268
GSM720618	HepG2 cells, control, rep2	2.69839

Profile: *HNF4a* expression

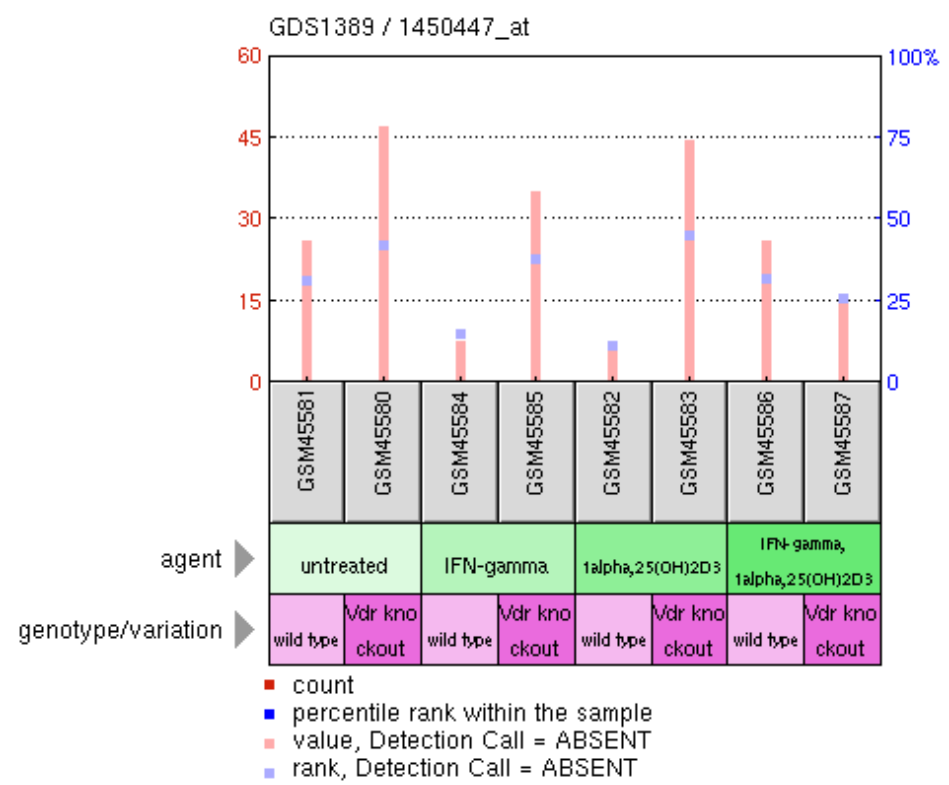
GDS1389 / 1450447_at

Title

1alpha,25-dihydroxyvitamin D3
suppressive effect on IFN-gamma
activated macrophages

Organism

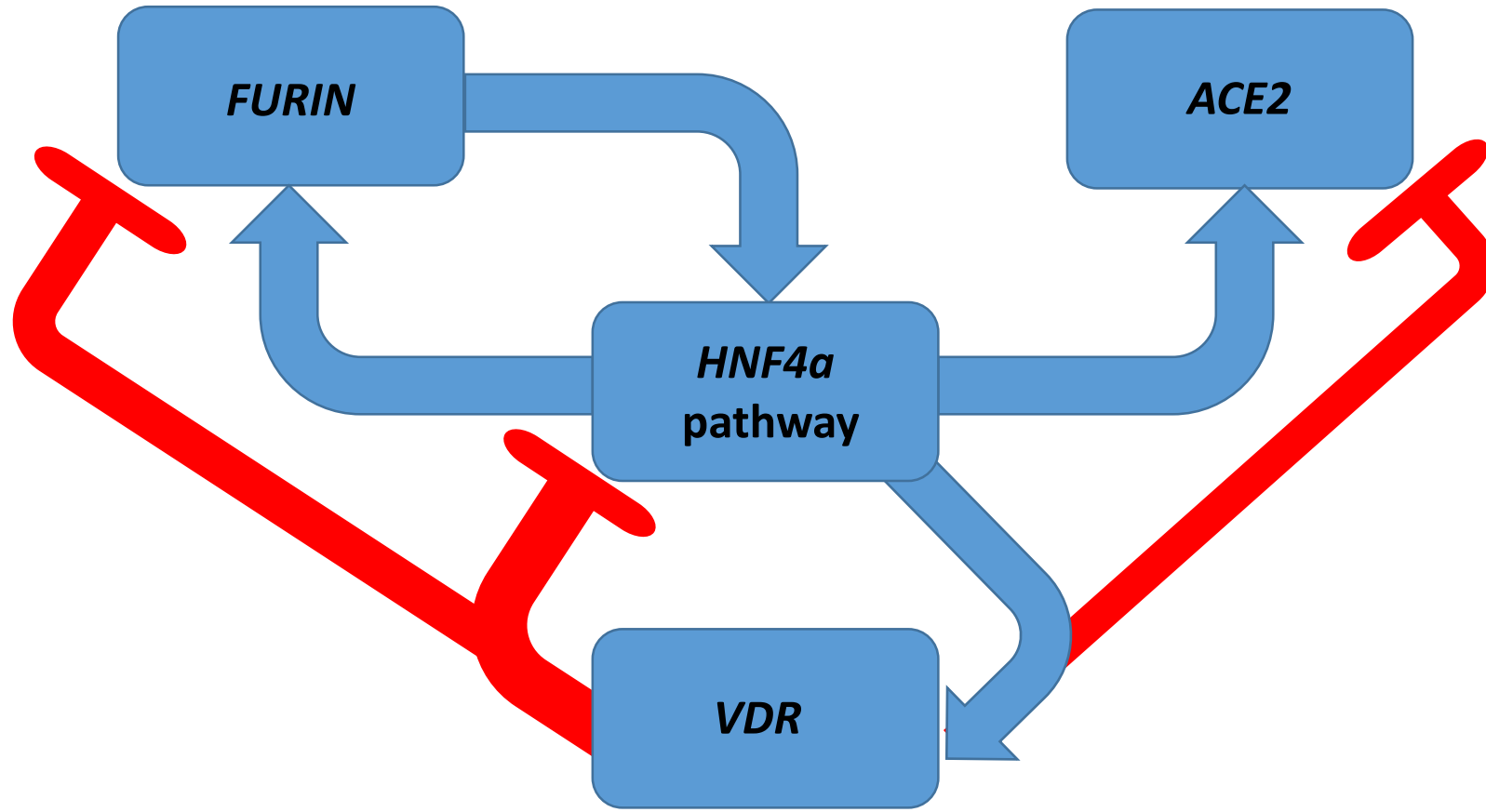
Mus musculus



VDR depletion increases *HNF4a* expression

Sample	Title	Value
GSM45581	0-WT	26.1
GSM45580	0-KO	47.2
GSM45584	IFN-WT	7.8
GSM45585	IFN-KO	35.4
GSM45582	Vit-WT	6.9
GSM45583	Vit-KO	44.6
GSM45586	IFN/Vit-WT	26.2
GSM45587	IFN/Vit-KO	15.1

HNF4a pathway-associated activation of the *ACE2* and *FURIN* expression may trigger the auto-regulatory positive feed-back loop of the *FURIN*-mediated activation of the *HNF4a* expression



ACE2 and FURIN

Supplemental Figure S8. Potential mechanisms affecting gene expression:
HIF1A gene product as potential repressor of the *ACE2* expression

Profile: ACE2 expression

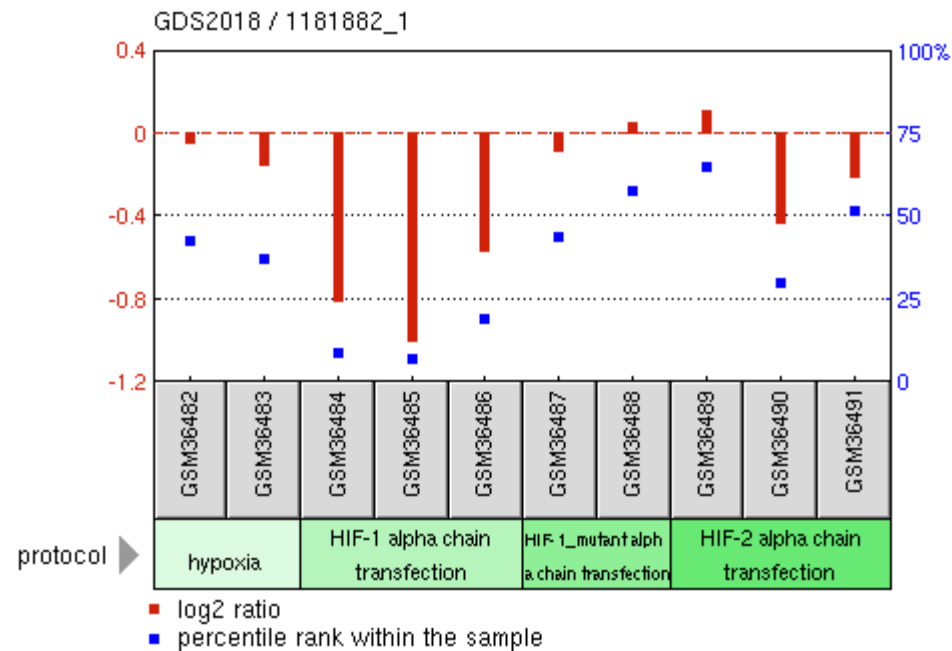
GDS2018 / 1181882_1

Title

Hypoxia-inducible factors-1 and -2
overexpression effect on
embryonic kidney cells

Organism

Homo sapiens



HIF1a inhibits the ACE2 expression

Sample	Title	Value	p-value
GSM36482	Nor:Hypo rep 1	-0.062	p < 0.05
GSM36483	Nor:Hypo rep 2	-0.161	
GSM36484	Nor:HIF1a rep 1	-0.821	p < 0.05
GSM36485	Nor:HIF1a rep 2	-1.013	
GSM36486	Nor:HIF1a rep 3	-0.575	
GSM36487	Nor:HIF1amut rep 1	-0.098	p < 0.05
GSM36488	Nor:HIF1amut rep 2	0.061	
GSM36489	Nor:HIF2a rep 1	0.115	p < 0.05
GSM36490	Nor:HIF2a rep 2	-0.44	
GSM36491	Nor:HIF2a rep 3	-0.222	

Profile: *HIF1α* expression

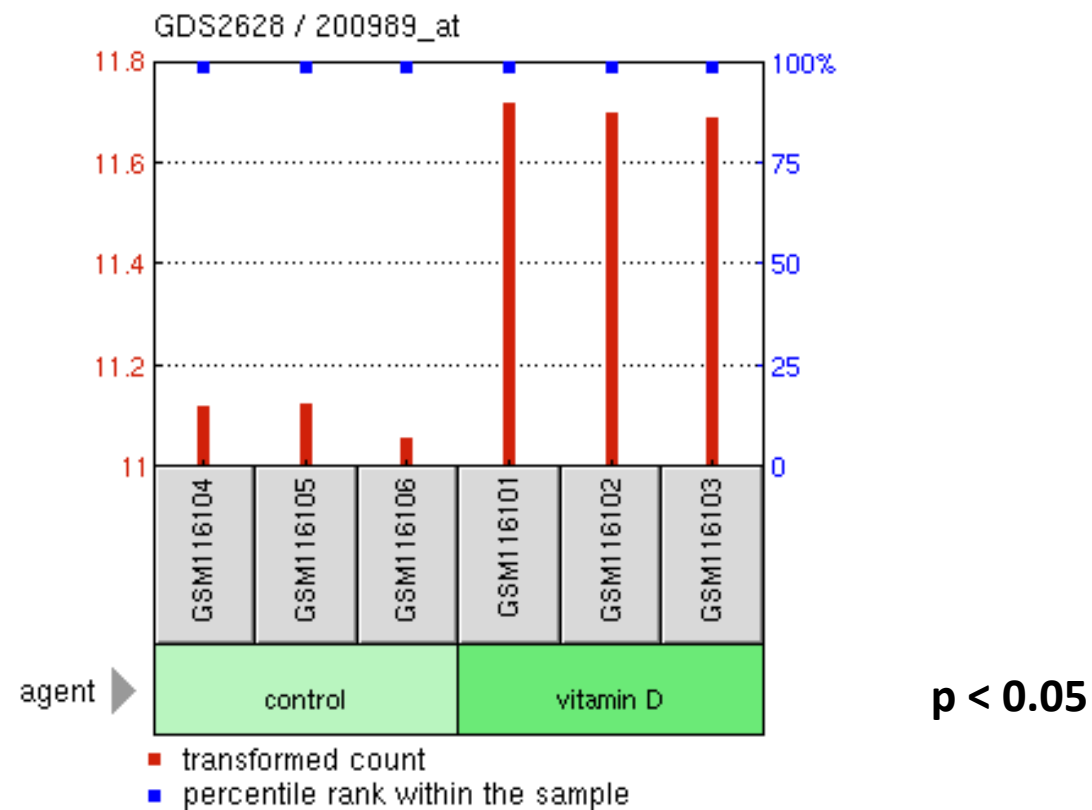
GDS2628 / 200989_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

Homo sapiens

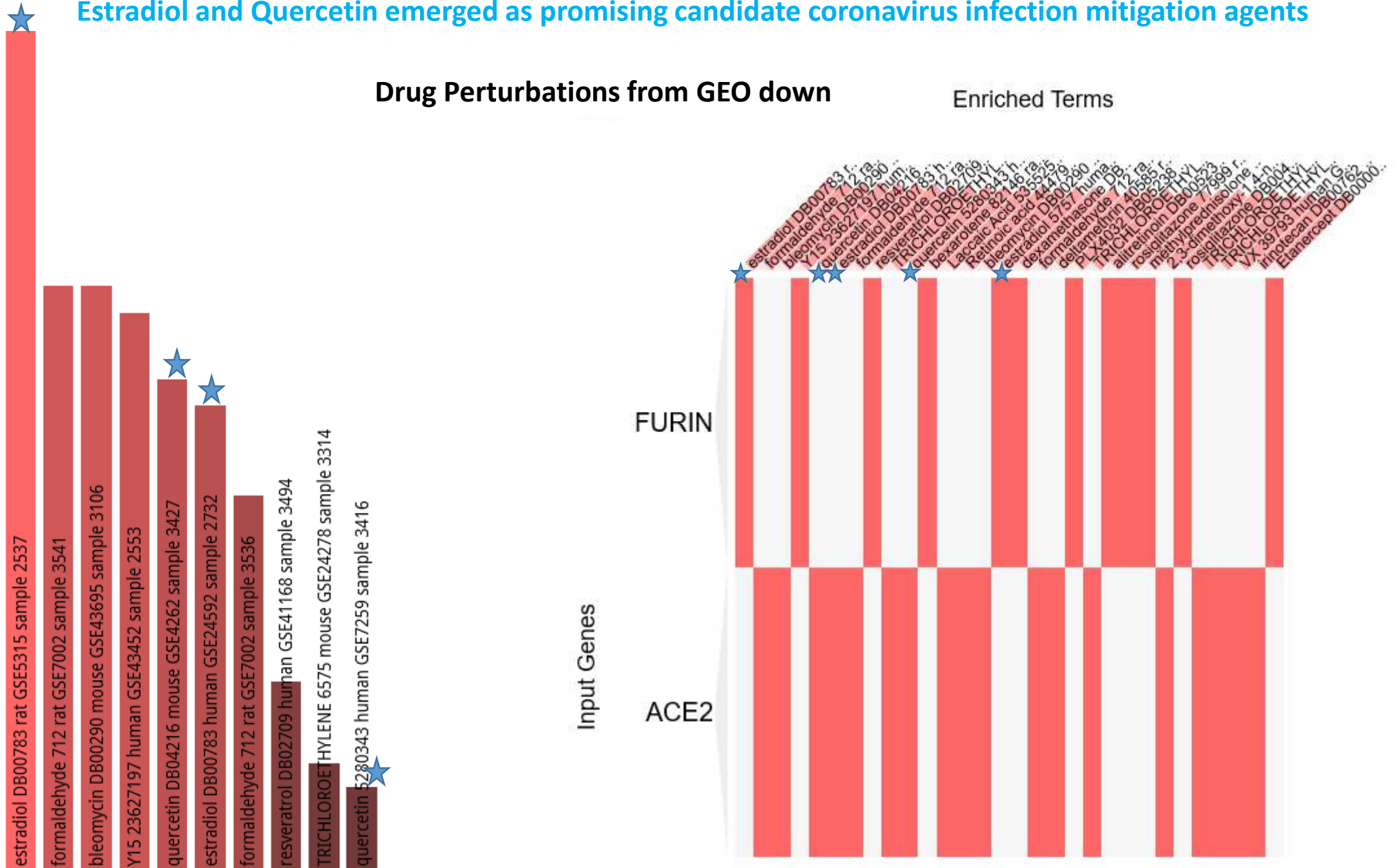


Vitamin D enhances the *HIF1α* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	11.1243
GSM116105	hBSMC_control_rep2	11.1271
GSM116106	hBSMC_control_rep3	11.0608
GSM116101	hBSMC_vitamin D_rep1	11.7223
GSM116102	hBSMC_vitamin D_rep2	11.7034
GSM116103	hBSMC_vitamin D_rep3	11.6893

Supplemental Figure S9. GSEA identify Estradiol and Quercetin as potential candidate coronavirus infection mitigation agents

Distinct patterns of drugs down-regulating expression of the *ACE2* and *FURIN* genes: Estradiol and Quercetin emerged as promising candidate coronavirus infection mitigation agents



Profile: *c-FOS* expression

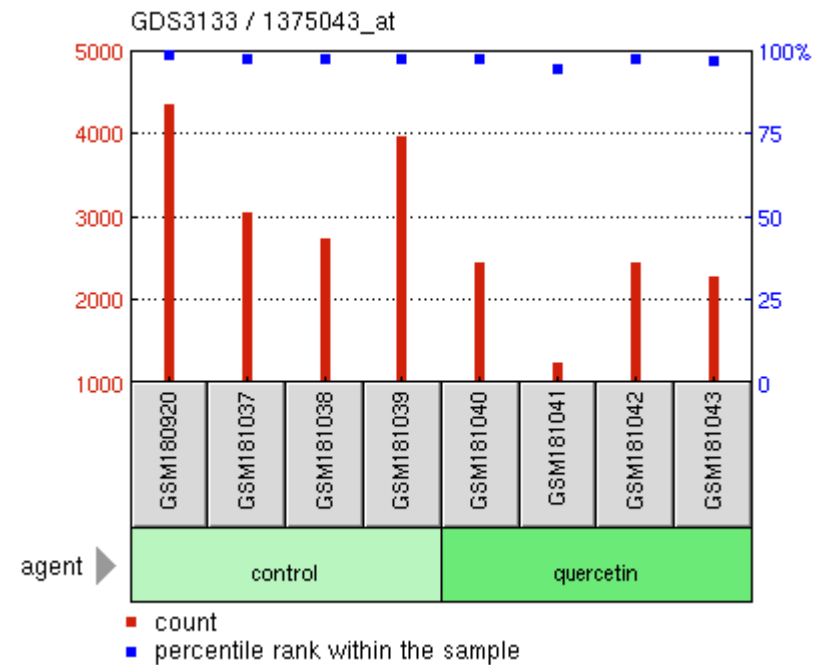
GDS3133 / 1375043_at

Title

Quercetin effect on the colonic mucosa

Organism

Rattus norvegicus



$p < 0.05$

Quercetin inhibits *c-Fos* expression

Sample	Title	Value
GSM180920	Control, sample 1	4352.72
GSM181037	Control, sample 2	3050.22
GSM181038	Control, sample 3	2743.92
GSM181039	Control, sample 4	3972.13
GSM181040	Quercetin, sample 1	2451.67
GSM181041	Quercetin, sample 2	1258.62
GSM181042	Quercetin, sample 3	2468.64
GSM181043	Quercetin, sample 4	2279.08

Profile: *c-FOS* expression

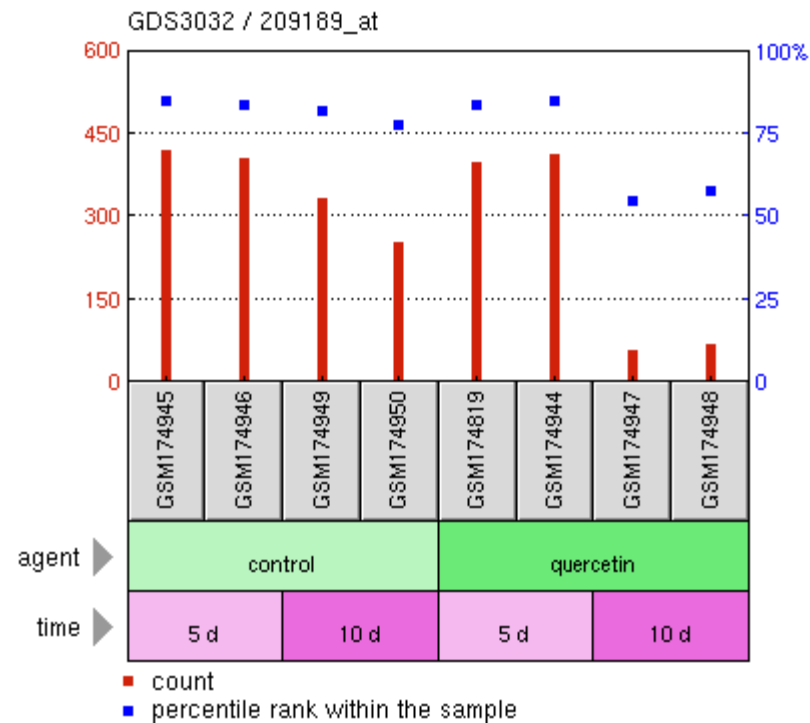
GDS3032 / 209189_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Day 10
p < 0.05

Quercetin inhibits *c-Fos* expression

Sample	Title	Value	
GSM174945	Control day 05 sample 1	420.956	
GSM174946	Control day 05 sample 2	404.99	
GSM174949	Control day 10 sample 1	332.662	
GSM174950	Control day 10 sample 2	256.542	
GSM174819	Quercetin day 05 sample 1	399.894	
GSM174944	Quercetin day 05 sample 2	413.261	
GSM174947	Quercetin day 10 sample 1	60.5856	p < 0.05
GSM174948	Quercetin day 10 sample 2	71.7716	

Profile: *c-FOS* expression

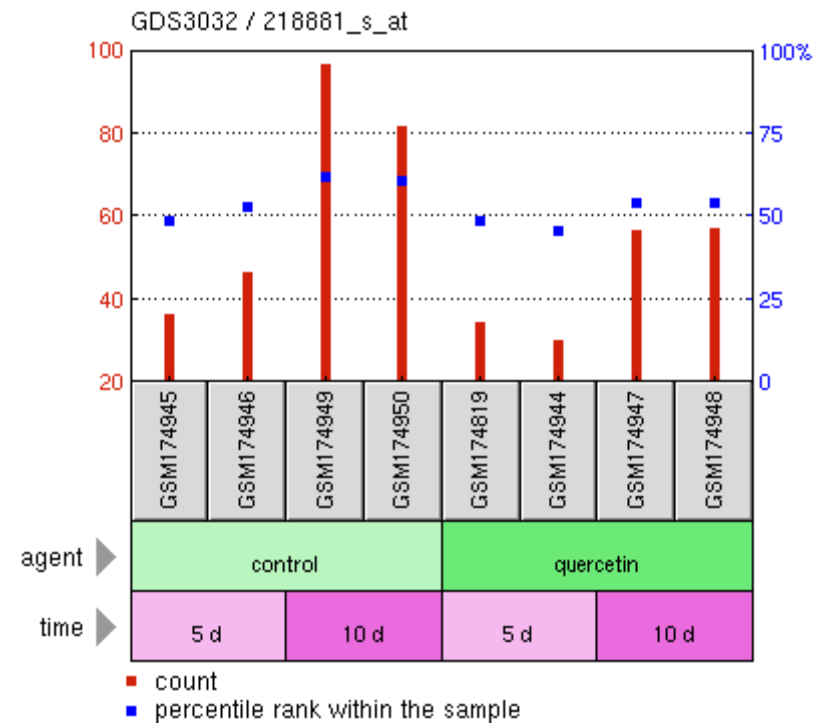
GDS3032 / 218881_s_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Day 10
 $p < 0.05$

Quercetin inhibits *c-Fos* expression

Sample	Title	Value
GSM174945	Control day 05 sample 1	36.7758
GSM174946	Control day 05 sample 2	46.8416
GSM174949	Control day 10 sample 1	96.6905
GSM174950	Control day 10 sample 2	81.9045
GSM174819	Quercetin day 05 sample 1	34.7583
GSM174944	Quercetin day 05 sample 2	30.5511
GSM174947	Quercetin day 10 sample 1	56.9884
GSM174948	Quercetin day 10 sample 2	57.2094

Profile: *Runx1* expression

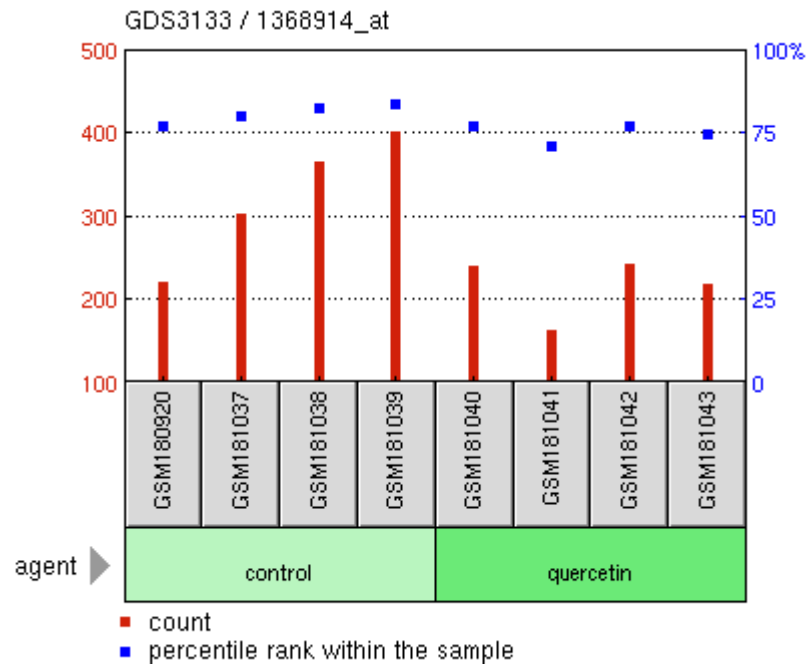
GDS3133 / 1368914_at

Title

Quercetin effect on the colonic mucosa

Organism

Rattus norvegicus



Day 10
p < 0.05

Quercetin inhibits *Runx1* expression

Sample	Title	Value
GSM180920	Control, sample 1	222.664
GSM181037	Control, sample 2	302.432
GSM181038	Control, sample 3	366.811
GSM181039	Control, sample 4	402.875
GSM181040	Quercetin, sample 1	241.637
GSM181041	Quercetin, sample 2	163.728
GSM181042	Quercetin, sample 3	243.316
GSM181043	Quercetin, sample 4	218.646

Profile: *Runxt1* expression

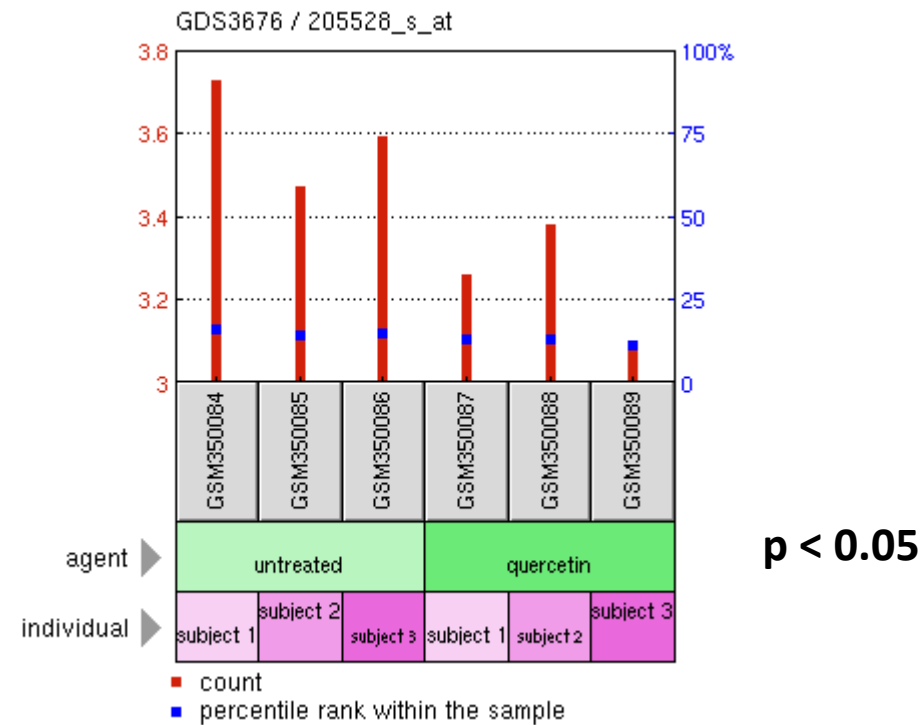
GDS3676 / 205528_s_at

Title

Quercetin effect on CD14+ monocyte

Organism

Homo sapiens



Quercetin inhibits *Runxt1* expression

Sample	Title	Value
GSM350084	CD14+ at baseline, biological replicate 1	3.72993
GSM350085	CD14+ at baseline, biological replicate 2	3.47495
GSM350086	CD14+ at baseline, biological replicate 3	3.59744
GSM350087	CD14+ after 2 wk quercetin supplementation, biological replicate 1	3.2641
GSM350088	CD14+ after 2 wk quercetin supplementation, biological replicate 2	3.38173
GSM350089	CD14+ after 2 wk quercetin supplementation, biological replicate 3	3.10117

***RUNXT1*, *RUNX1* translocation partner 1**

Profile: *HNF4a* expression

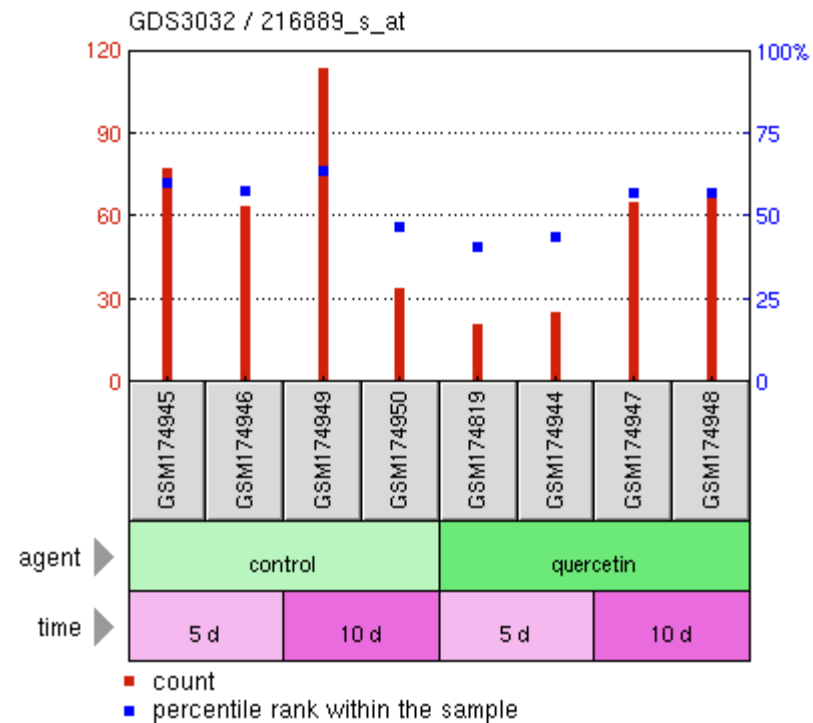
GDS3032 / 216889_s_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Day 5
p < 0.05

Quercetin inhibits *HNF4a* expression

Sample	Title	Value
GSM174945	Control day 05 sample 1	77.6175
GSM174946	Control day 05 sample 2	63.792
GSM174949	Control day 10 sample 1	113.821
GSM174950	Control day 10 sample 2	34.1332
GSM174819	Quercetin day 05 sample 1	21.0188
GSM174944	Quercetin day 05 sample 2	25.7496
GSM174947	Quercetin day 10 sample 1	65.2834
GSM174948	Quercetin day 10 sample 2	69.9663

Profile: *c-FOS* expression

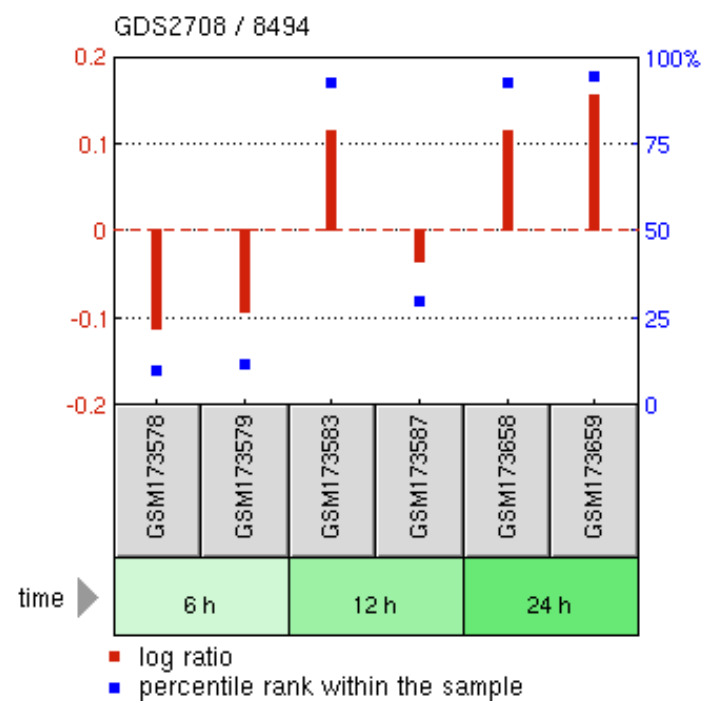
GDS2708 / 8494

Title

Quercetin effect on cultured cardiomyocytes: time course

Organism

Rattus norvegicus

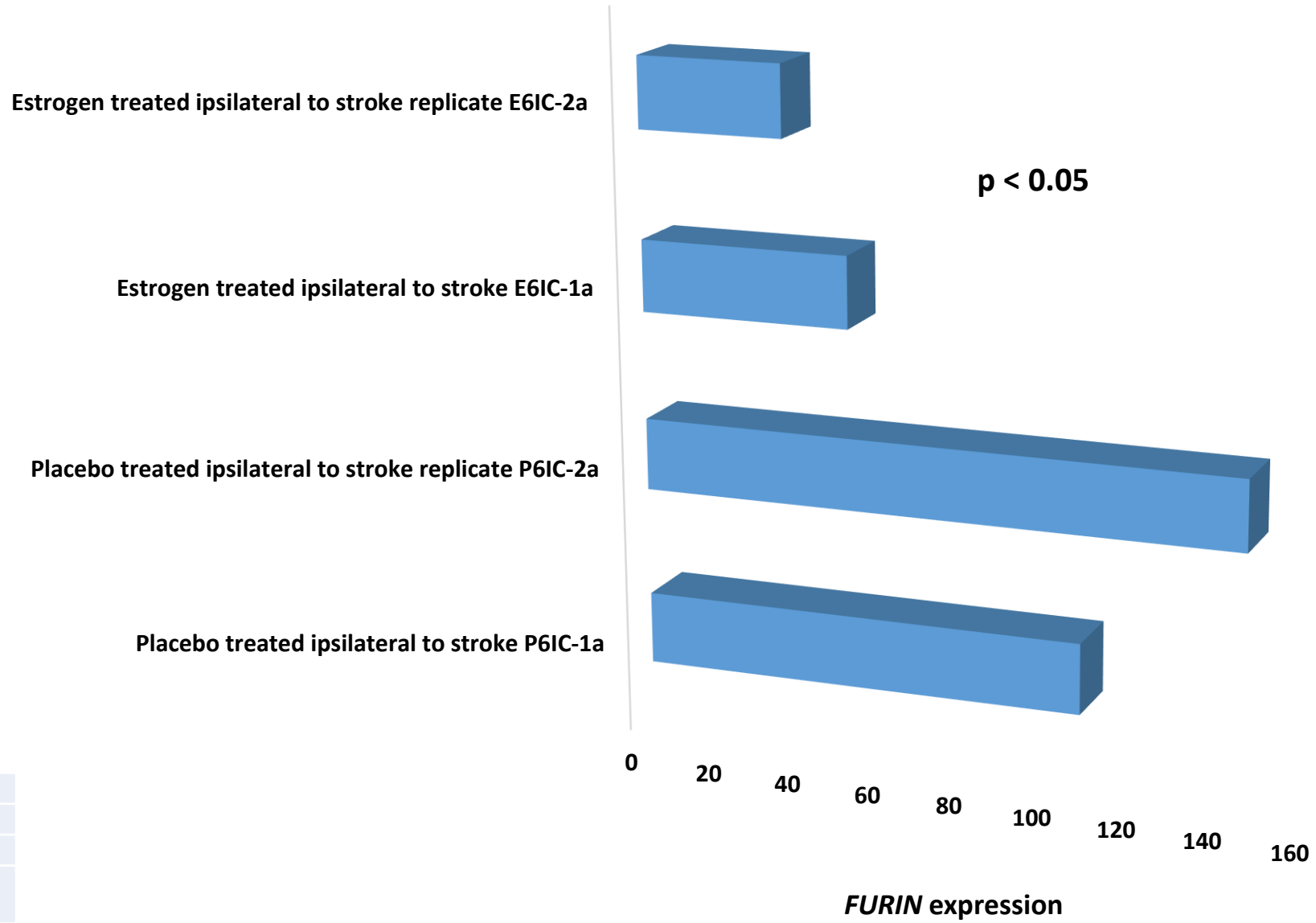


Quercetin increases *c-Fos* expression

Sample	Title	Value
GSM173578	Quercetin treated cardiomyocytes for 6 hours (Q6-A).	-0.114041
GSM173579	Quercetin treated cardiomyocytes for 6 hours (Q6-B).	-0.0962766
GSM173583	Quercetin treated cardiomyocytes for 12 hours (Q12-A).	0.118043
GSM173587	Quercetin treated cardiomyocytes for 12 hours (Q12-B).	-0.0368638
GSM173658	Quercetin treated cardiomyocytes for 24 hours (Q24-A).	0.118043
GSM173659	Quercetin treated cardiomyocytes for 24 hours (Q24-B).	0.15779

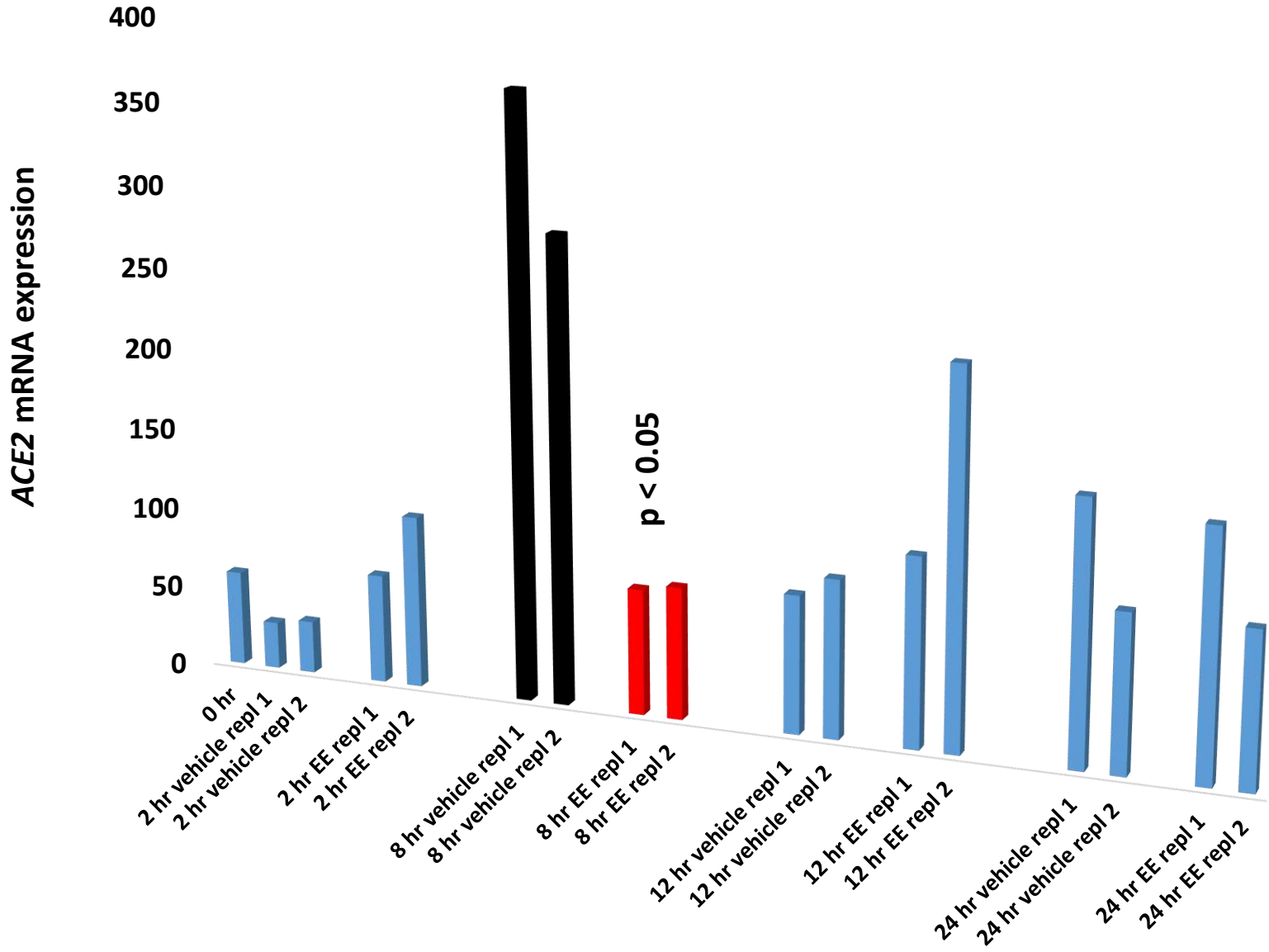
Supplemental Figure S10. Estradiol and Quercetin manifest activities as potential candidate coronavirus infection mitigation agents

Estradiol effect on *FURIN* expression in the rat ischemic brain



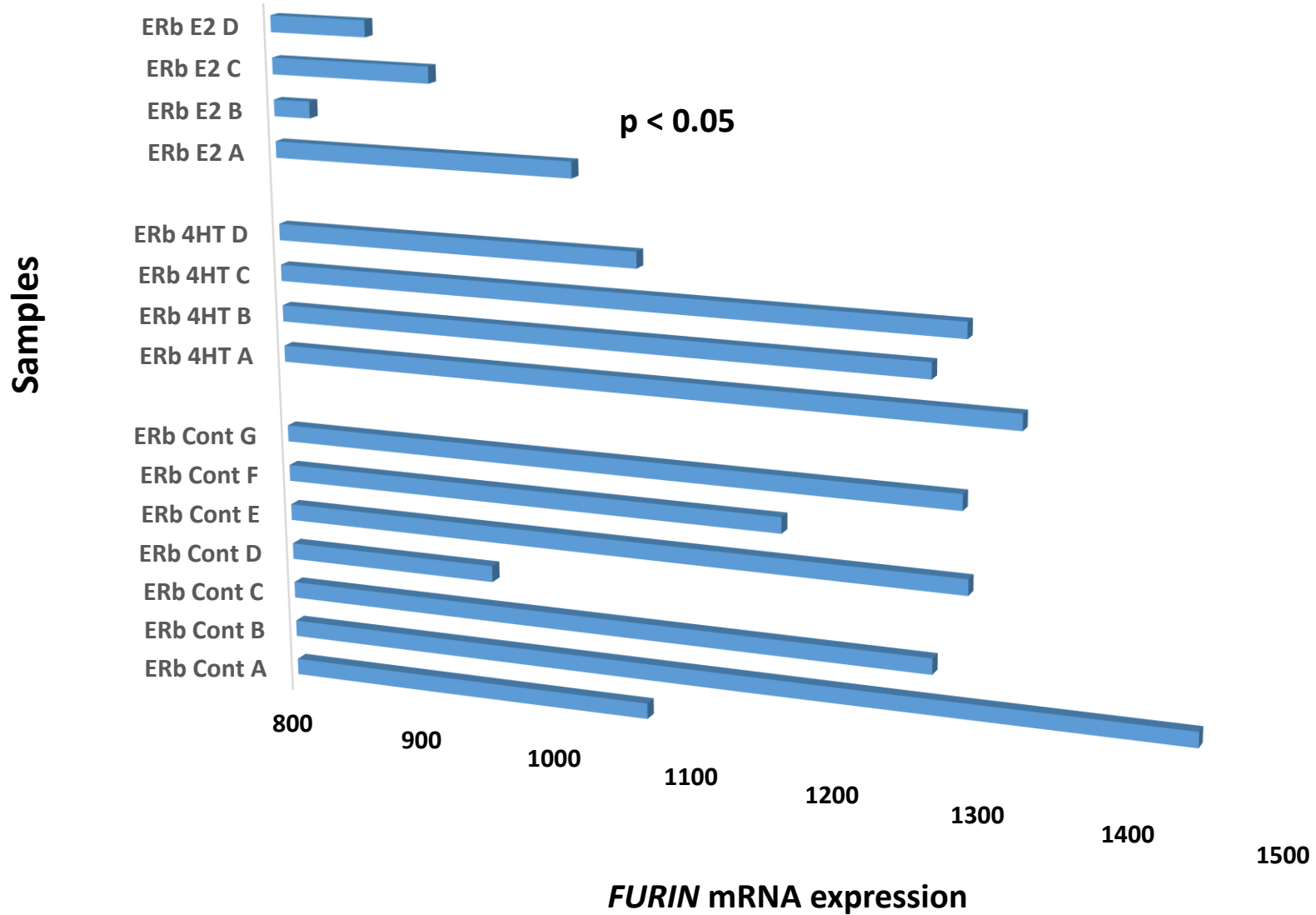
GEO Profile
GDS2311 / X55660_at
Title
Estradiol effect on the ischemic brain
Organism
Rattus norvegicus

Ethynyl estradiol effects on ACE2 expression in mouse uterus



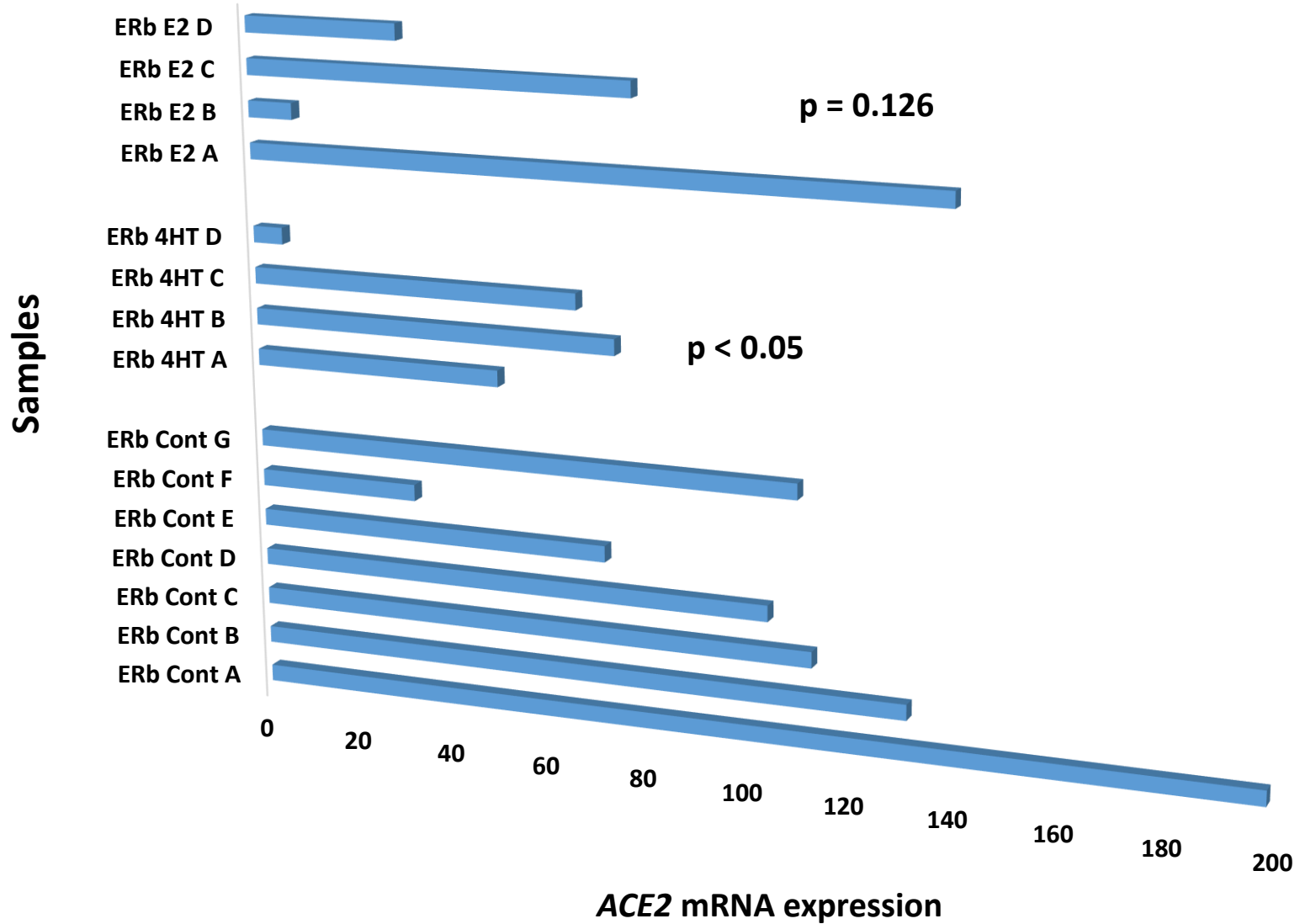
GEO Profile
GDS285 / AA690434_at
Title
Ethynyl estradiol estrogen effect in uterus
Organism
Mus musculus

Effects of estradiol and tamoxifen on *FURIN* expression mediated by the estrogen receptor beta



GEO Profile
GDS1094 / 201945_at
Title
Estrogen receptor alpha/beta heterodimer action in response to estrogen and tamoxifen
Organism
Homo sapiens

Effects of estradiol and tamoxifen on ACE2 expression mediated by the estrogen receptor beta



GEO Profile
GDS1094 / 219962_at
Title
Estrogen receptor alpha/beta heterodimer action in response to estrogen and tamoxifen
Organism
Homo sapiens

Profile: ACE2 expression

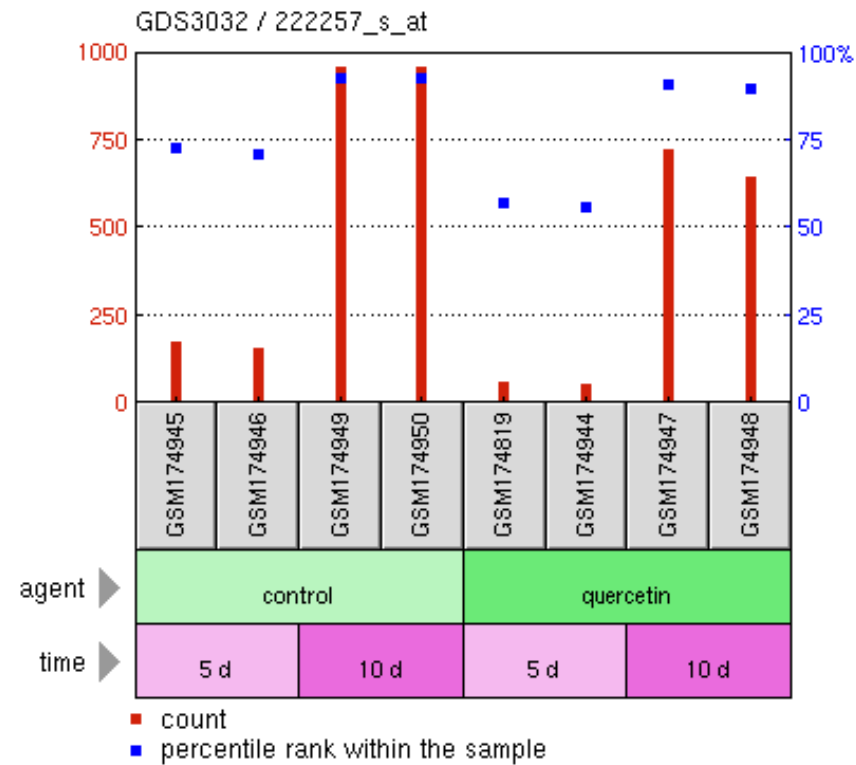
GDS3032 / 222257_s_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Day 5
p < 0.05

Day 10
p < 0.05

Quercetin inhibits the ACE2 expression

Sample	Title	Value
GSM174945	Control day 05 sample 1	176.763
GSM174946	Control day 05 sample 2	157.459
GSM174949	Control day 10 sample 1	962.644
GSM174950	Control day 10 sample 2	959.364
GSM174819	Quercetin day 05 sample 1	60.6977
GSM174944	Quercetin day 05 sample 2	59.0821
GSM174947	Quercetin day 10 sample 1	725.488
GSM174948	Quercetin day 10 sample 2	649.304

Profile: ACE2 expression

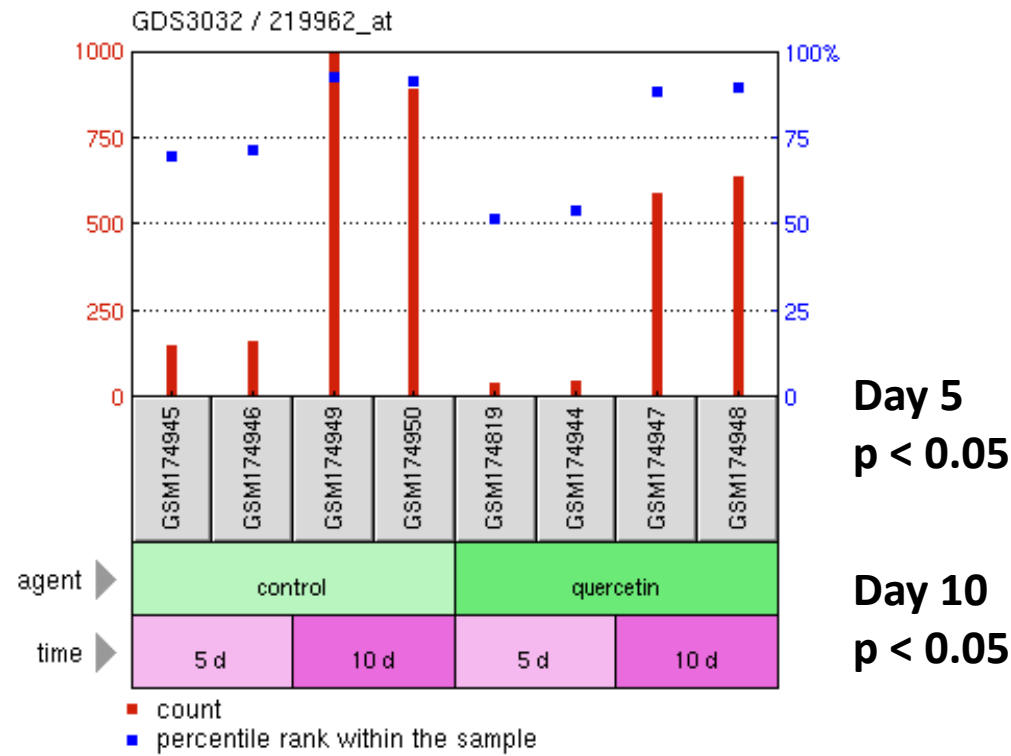
GDS3032 / 219962_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens

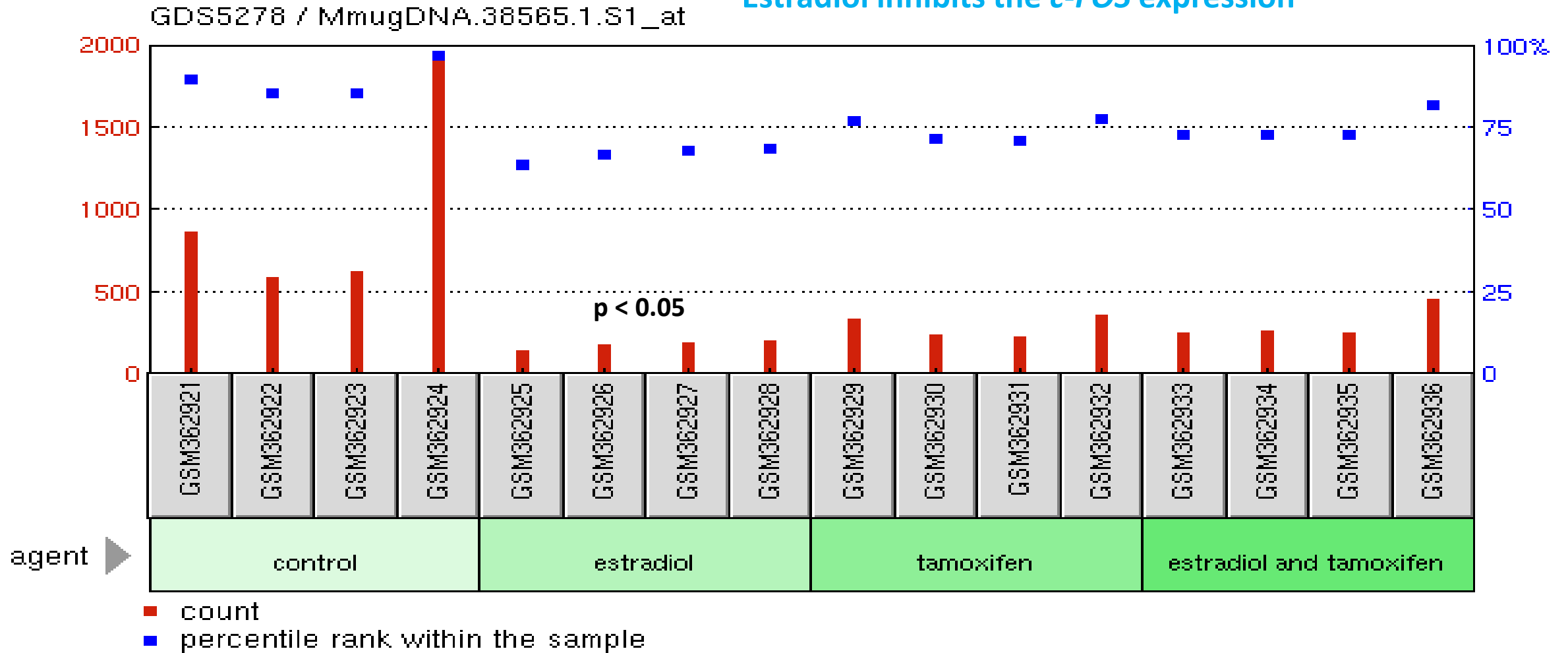


Quercetin inhibits the ACE2 expression

Sample	Title	Value
GSM174945	Control day 05 sample 1	152.856
GSM174946	Control day 05 sample 2	163.228
GSM174949	Control day 10 sample 1	995.184
GSM174950	Control day 10 sample 2	895.468
GSM174819	Quercetin day 05 sample 1	43.9228
GSM174944	Quercetin day 05 sample 2	49.8735
GSM174947	Quercetin day 10 sample 1	595.486
GSM174948	Quercetin day 10 sample 2	642.974

Profile: *c-FOS* expression
 GDS5278 / MmugDNA.38565.1.S1_at
 Title
 Endometrium response to tamoxifen and low dose estradiol
 combination therapy
 Organism: *Macaca mulatta*

Estradiol inhibits the *c-FOS* expression



Profile: *c-FOS* expression
GDS5278 / MmugDNA.38565.1.S1_at

Title

Endometrium response to tamoxifen and low dose estradiol
combination therapy

Organism: *Macaca mulatta*

Estradiol inhibits the *c-FOS* expression

Sample	Title	Value	
GSM362921	Control 1	868.444	
GSM362922	Control 2	596.312	
GSM362923	Control 3	633.478	
GSM362924	Control 4	1956.61	
GSM362925	Estradiol 1	147.047	p < 0.05
GSM362926	Estradiol 2	183.666	
GSM362927	Estradiol 3	194.779	
GSM362928	Estradiol 4	212.397	
GSM362929	Tamoxifen 1	347.062	
GSM362930	Tamoxifen 2	241.809	
GSM362931	Tamoxifen 3	238.437	
GSM362932	Tamoxifen 4	363.108	
GSM362933	Estradiol and Tamoxifen 1	255.806	
GSM362934	Estradiol and Tamoxifen 2	272.225	
GSM362935	Estradiol and Tamoxifen 3	264.55	
GSM362936	Estradiol and Tamoxifen 4	459.833	

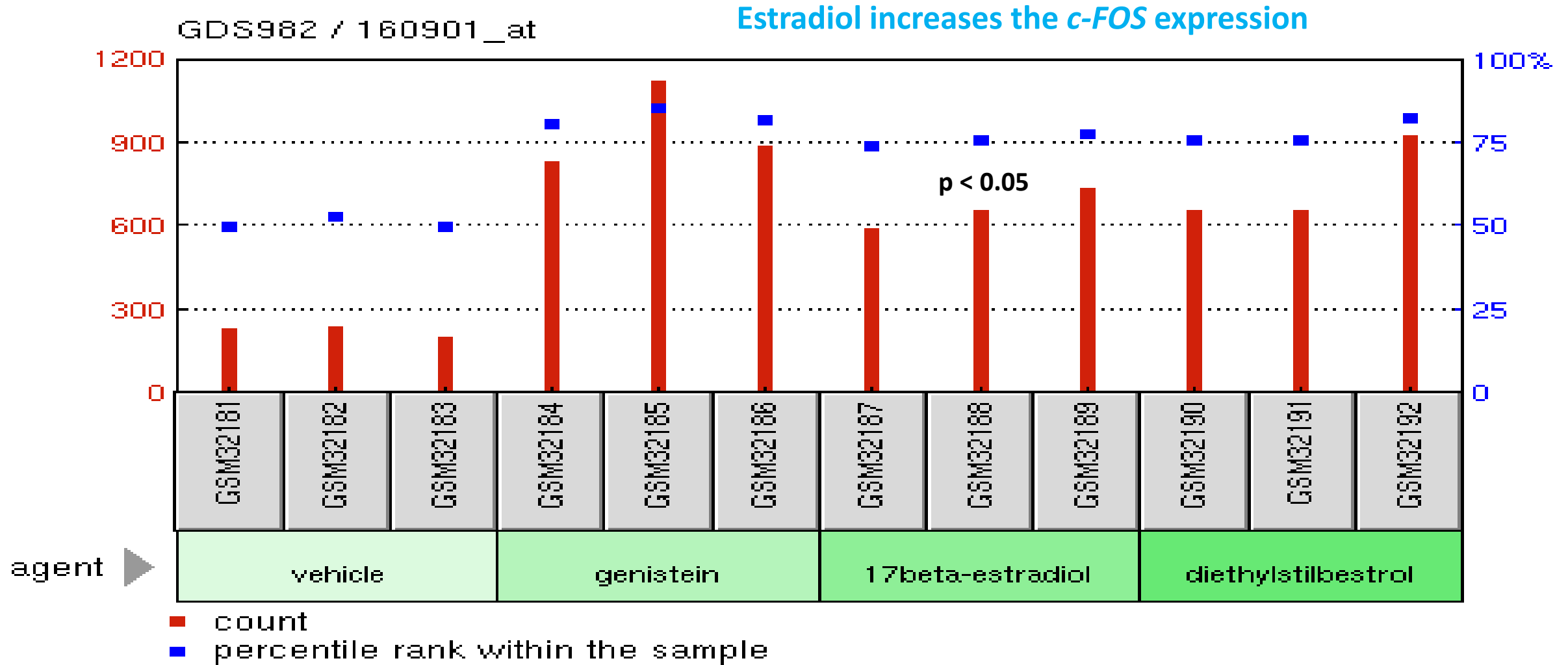
Profile: *c-FOS* expression

GDS982 / 160901_at

Title

Uterine response to physiologic, plant-derived, and synthetic estrogen

Organism: *Mus musculus*



Profile: *c-FOS* expression

GDS982 / 160901_at

Title

Uterine response to physiologic, plant-derived, and synthetic estrogen

Organism

Mus musculus

Estradiol increases the *c-FOS* expression

Sample	Title	Value
GSM32181	AO C1	236.8
GSM32182	AO C2	239.8
GSM32183	AO C3	208.6
GSM32184	GEN G1	834.7
GSM32185	GEN G2	1122.6
GSM32186	GEN G3	892.9
GSM32187	E2 E1	599.6
GSM32188	E2 E2	660.6 p < 0.05
GSM32189	E2 E3	740.3
GSM32190	DES D1	659.8
GSM32191	DES D2	663.9
GSM32192	DES D3	928.8

Supplemental Figure S11.

Testosterone effects on gene expression

An overview of the potential coronavirus-infection promoting activities

Profile: *ACE2* expression

GDS2920 / 222257_s_at

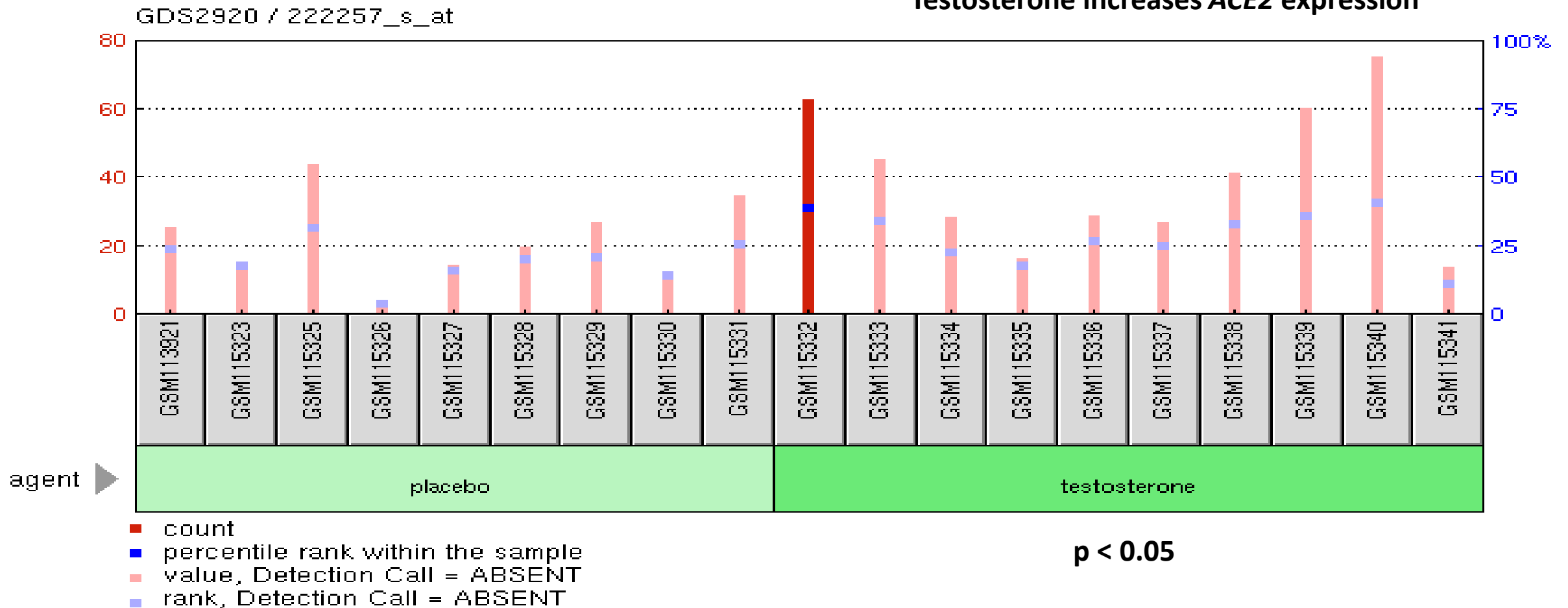
Title

Testosterone effect on skeletal muscles of HIV-infected males
experiencing weight loss

Organism

Homo sapiens

Testosterone increases *ACE2* expression



Profile: *ACE2* expression

GDS2920 / 222257_s_at

Title

Testosterone effect on skeletal muscles of HIV-infected males
experiencing weight loss

Organism

Homo sapiens

Testosterone increases *ACE2* expression

Sample	Title	Value
GSM113921	Placebo treated, HIV-1 positive male, day 14 (1)	25.8
GSM115323	Placebo treated, HIV-1 positive male, day 14 (2)	14.3
GSM115325	Placebo treated, HIV-1 positive male, day 14 (3)	44.3
GSM115326	Placebo treated, HIV-1 positive male, day 14 (4)	3.1
GSM115327	Placebo treated, HIV-1 positive male, day 14 (5)	14.8
GSM115328	Placebo treated, HIV-1 positive male, day 14 (6)	20.2
GSM115329	Placebo treated, HIV-1 positive male, day 14 (7)	27
GSM115330	Placebo treated, HIV-1 positive male, day 14 (8)	11.7
GSM115331	Placebo treated, HIV-1 positive male, day 14 (9)	34.9
GSM115332	Testosterone treated, HIV-1 positive male, day 14 (1)	63.1
GSM115333	Testosterone treated, HIV-1 positive male, day 14 (2)	45.6
GSM115334	Testosterone treated, HIV-1 positive male, day 14 (3)	28.8
GSM115335	Testosterone treated, HIV-1 positive male, day 14 (4)	16.8
GSM115336	Testosterone treated, HIV-1 positive male, day 14 (5)	29.2
GSM115337	Testosterone treated, HIV-1 positive male, day 14 (6)	27.3
GSM115338	Testosterone treated, HIV-1 positive male, day 14 (7)	41.7
GSM115339	Testosterone treated, HIV-1 positive male, day 14 (8)	60.3
GSM115340	Testosterone treated, HIV-1 positive male, day 14 (9)	75.5
GSM115341	Testosterone treated, HIV-1 positive male, day 14 (10)	14.1

p < 0.05

Profile: *ACE2* expression

GDS1361 / 1598

Title

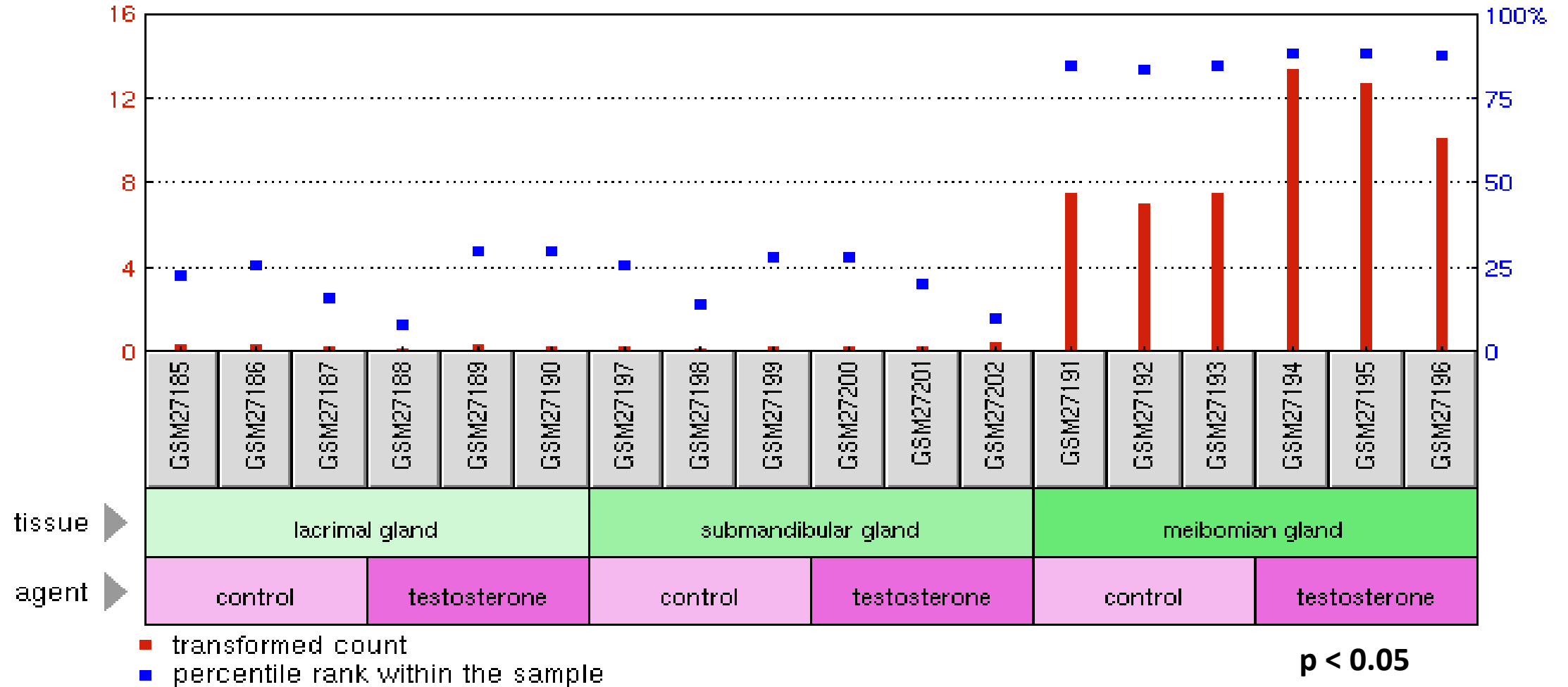
Testosterone effect on meibomian gland

Organism

Mus musculus

GDS1361 / 1598

Testosterone increases *ACE2* expression



Profile: ACE2 expression

GDS1361 / 1598

Title

Testosterone effect on meibomian gland

Organism

Mus musculus

Testosterone increases ACE2 expression

Sample	Title	Value
GSM27185	Male Placebo-Treated Lacrimal Gland Sample A	0.432225
GSM27186	Male Placebo-Treated Lacrimal Gland Sample B	0.457711
GSM27187	Male Placeo-Treated Lacrimal Gland Sample C	0.359507
GSM27188	Male Testosterone-Treated Lacrimal Gland Sample A	0.276599
GSM27189	Male Testosterone-Treated Lacrimal Gland Sample B	0.425166
GSM27190	Male Testosterone-Treated Lacrimal Gland Sample C	0.367615
GSM27197	Male Placebo-Treated Submandibular Gland Sample A	0.343573
GSM27198	Male Placebo-Treated Submandibular Gland Sample B	0.271271
GSM27199	Male Placebo-Treated Submandibular Gland Sample C	0.384337
GSM27200	Male Testosterone-Treated Submandibular Gland Sample A	0.365324
GSM27201	Male Testosterone-Treated Submandibular Gland Sample B	0.308682
GSM27202	Male Testosterone-Treated Submandibular Gland Sample C	0.205059
GSM27191	Male Placebo-Treated Meibomian Gland Sample A	7.61018
GSM27192	Male Placebo-Treated Meibomian Gland Sample B	7.08807 p < 0.05
GSM27193	Male Placebo-Treated Meibomian Gland Sample C	7.54525
GSM27194	Male Testosterone-Treated Meibomian Gland Sample A	13.4706
GSM27195	Male Testosterone-Treated Meibomian Gland Sample B	12.7558
GSM27196	Male Testosterone-Treated Meibomian Gland Sample C	10.1925

Profile: *ACE2* expression

GDS1832 / 1598

Title

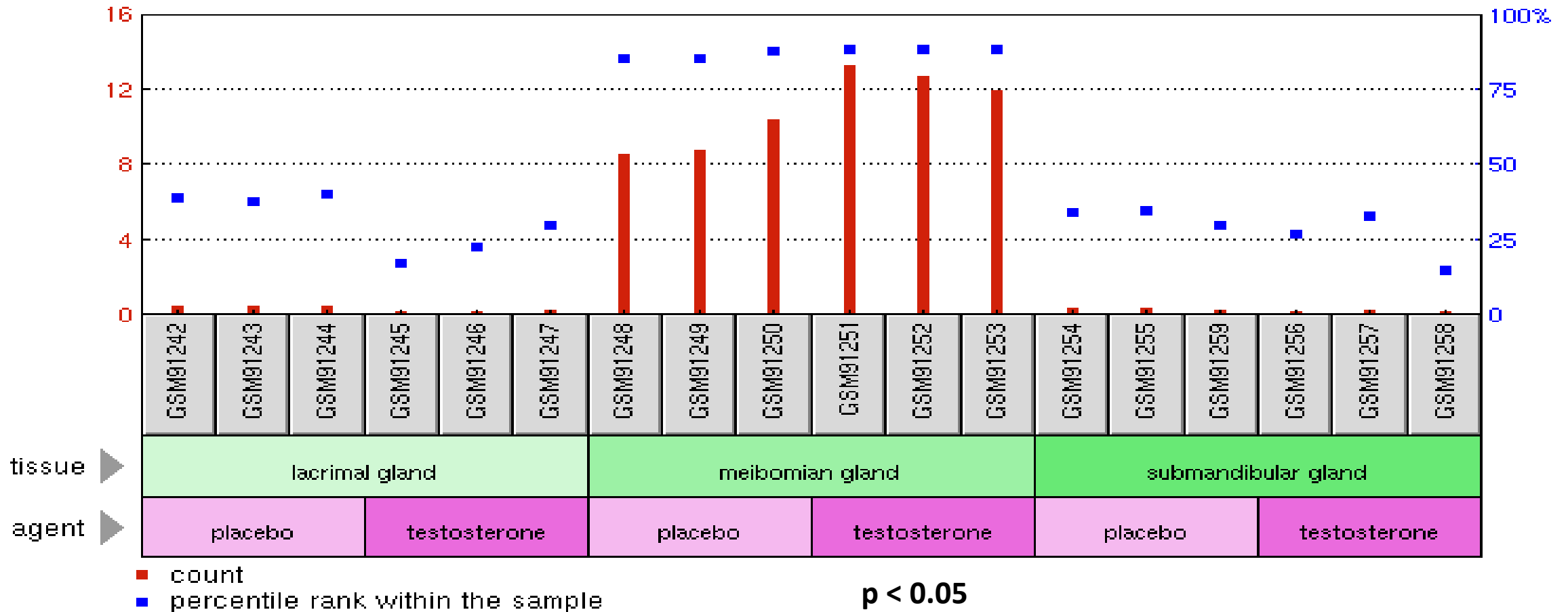
Testosterone effect on female lacrimal, meibomian, and submandibular glands

Organism

Mus musculus

GDS1832 / 1598

Testosterone increases *ACE2* expression



Profile: ACE2 expression**GDS1832 / 1598****Title****Testosterone effect on female lacrimal, meibomian, and submandibular glands****Organism****Mus musculus****Testosterone increases ACE2 expression**

Sample	Title	Value	
GSM91242	Female Placebo-Treated Lacrimal Gland Sample A	0.560279	
GSM91243	Female Placebo-Treated Lacrimal Gland Sample B	0.522894	p < 0.05
GSM91244	Female Placebo-Treated Lacrimal Gland Sample C	0.566438	
GSM91245	Female Testosterone-Treated Lacrimal Gland Sample A		0.23071
GSM91246	Female Testosterone-Treated Lacrimal Gland Sample B		0.275703
GSM91247	Female Testosterone-Treated Lacrimal Gland Sample C		0.385156
GSM91248	Female Placebo-Treated Meibomian Gland Sample A	8.58739	
GSM91249	Female Placebo-Treated Meibomian Gland Sample B	8.79653	
GSM91250	Female Placebo-Treated Meibomian Gland Sample C	10.4129	
GSM91251	Female Testosterone-Treated Meibomian Gland Sample A		13.3238
GSM91252	Female Testosterone-Treated Meibomian Gland Sample B		12.7645 p < 0.05
GSM91253	Female Testosterone-Treated Meibomian Gland Sample C		11.962
GSM91254	Female Placebo-Treated Submandibular Gland Sample B	0.398068	
GSM91255	Female Placebo-Treated Submandibular Gland Sample C	0.403039	
GSM91259	Female Placebo-Treated Submandibular Gland Sample A	0.35605	
GSM91256	Female Testosterone-Treated Submandibular Gland Sample A	0.238247	
GSM91257	Female Testosterone-Treated Submandibular Gland Sample B	0.365064	p = 0.130
GSM91258	Female Testosterone-Treated Submandibular Gland Sample C	0.206147	

Profile: *FURIN* expression

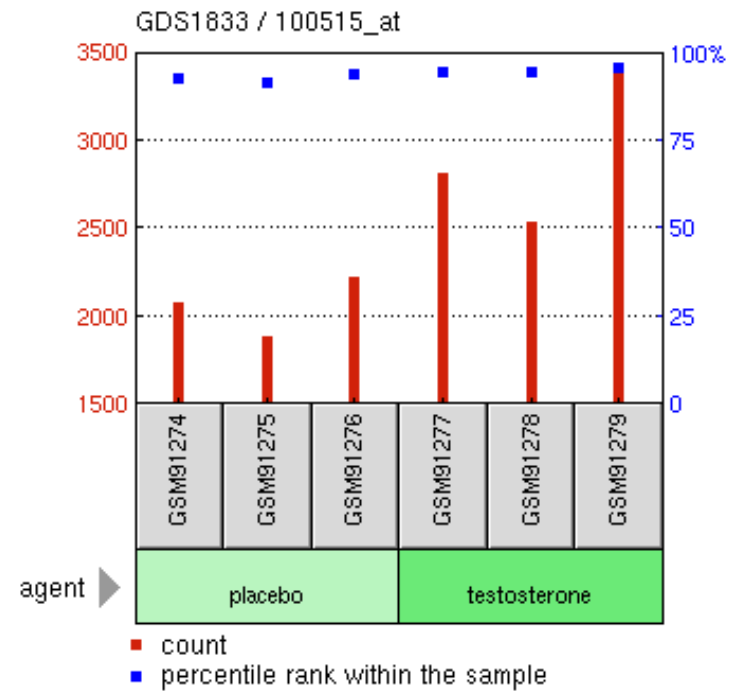
GDS1833 / 100515_at

Title

Testosterone effect on the female submandibular gland

Organism

Mus musculus



Testosterone increases *FURIN* expression

Sample	Title	Value	
GSM91274	Female Placebo-Treated Submandibular Gland Sample A Technical Replicate	2087.8	
GSM91275	Female Placebo-Treated Submandibular Gland Sample B Technical Replicate	1888.3	p < 0.05
GSM91276	Female Placebo-Treated Submandibular Gland Sample C Technical Replicate	2230.6	
GSM91277	Female Testosterone-Treated Submandibular Gland Sample A Technical Replicate	2822.9	
GSM91278	Female Testosterone-Treated Submandibular Gland Sample B Technical Replicate	2536.3	
GSM91279	Female Testosterone-Treated Submandibular Gland Sample C Technical Replicate	3392.9	

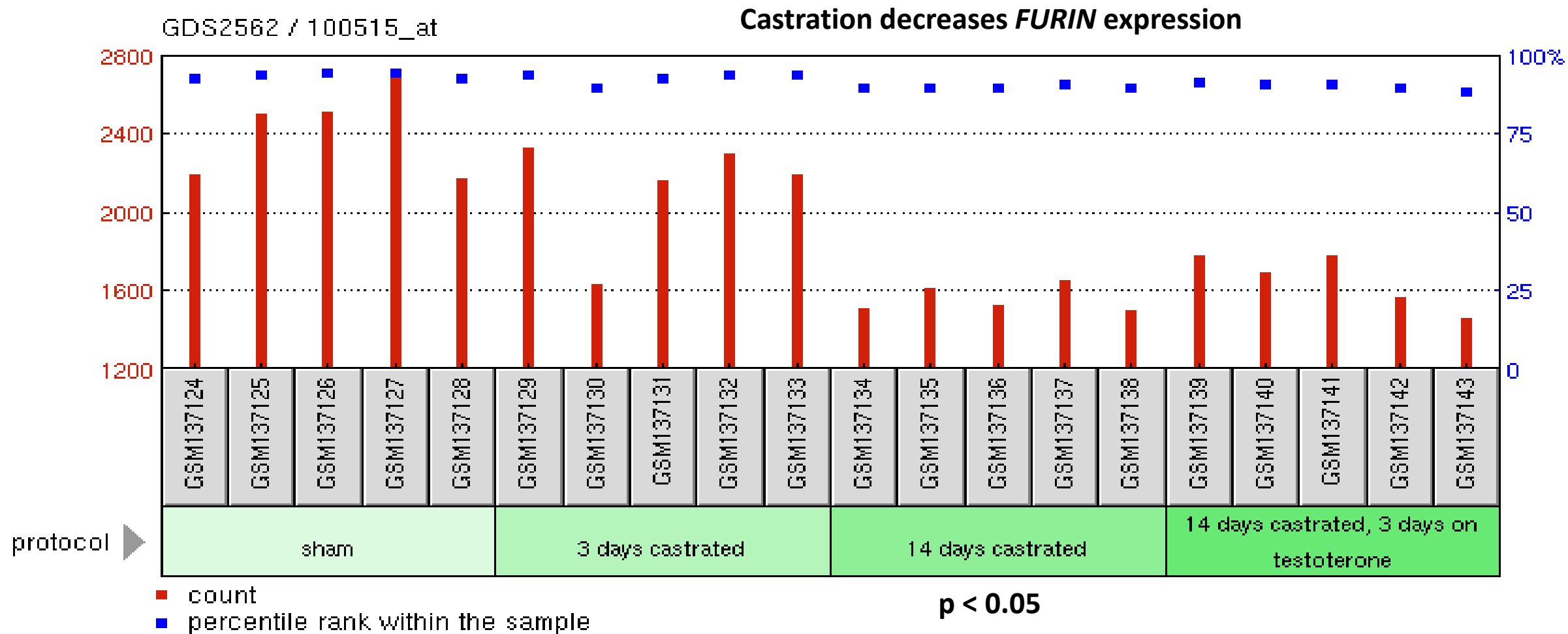
Profile: *FURIN* expression

GDS2562 / 100515_at

Title

Prostate response to castration and subsequent hormone replacement

Organism: *Mus musculus*



Profile: *FURIN* expression

GDS2562 / 100515_at

Title

Prostate response to castration and subsequent hormone replacement

Organism: *Mus musculus*

Castration decreases *FURIN* expression

Sample	Title	Value
GSM137124	PRB3660 (MG-U74A)	2201.3
GSM137125	PRB3661 (MG-U74A)	2506.4
GSM137126	PRB3662 (MG-U74A)	2519.5
GSM137127	PRB3663 (MG-U74A)	2710.3
GSM137128	PRB3664 (MG-U74A)	2173.5
GSM137129	PRB3665 (MG-U74A)	2332.6
GSM137130	PRB3666 (MG-U74A)	1636.1
GSM137131	PRB3667 (MG-U74A)	2167.8
GSM137132	PRB3668 (MG-U74A)	2305.2
GSM137133	PRB3669 (MG-U74A)	2193.6
GSM137134	PRB3698 (MG-U74A)	1510.4
GSM137135	PRB3699 (MG-U74A)	1619.7
GSM137136	PRB3700 (MG-U74A)	p < 0.05 1532.1
GSM137137	PRB3701 (MG-U74A)	1654.5
GSM137138	PRB3702 (MG-U74A)	1502.6
GSM137139	PRB3708 (MG-U74A)	1787.8
GSM137140	PRB3709 (MG-U74A)	1695.8
GSM137141	PRB3710 (MG-U74A)	1787.3
GSM137142	PRB3711 (MG-U74A)	1575.8
GSM137143	PRB3712 (MG-U74A)	1467.6

Profile: *FURIN* expression

GDS1361 / 5982

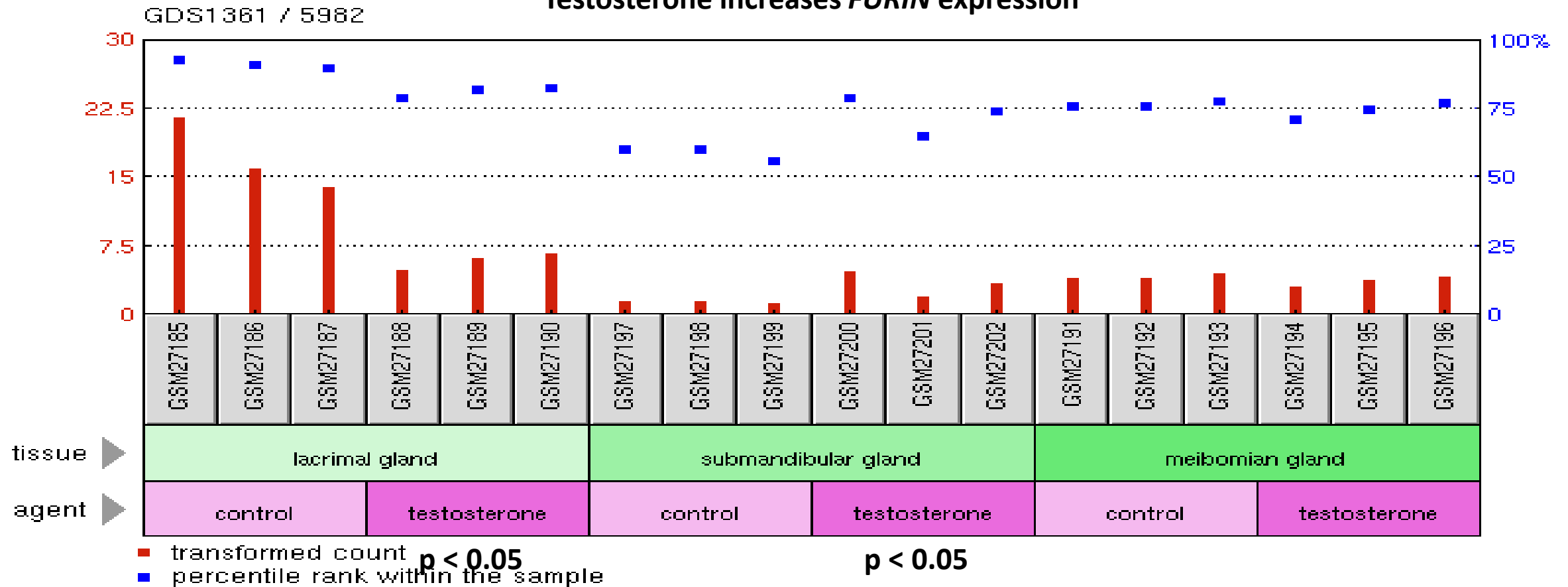
Title

Testosterone effect on meibomian gland

Organism

Mus musculus

Testosterone increases *FURIN* expression



Profile: *FURIN* expression

GDS1361 / 5982

Title

Testosterone effect on meibomian gland

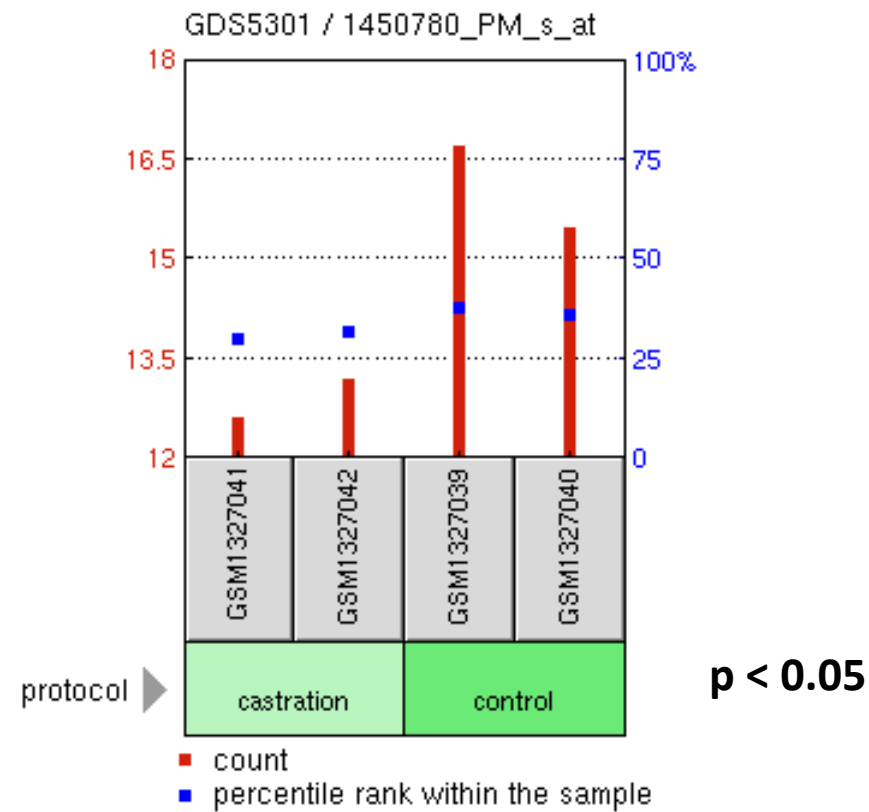
Organism

Mus musculus

Testosterone effects on *FURIN* expression

Sample	Title	Value	
GSM27185	Male Placebo-Treated Lacrimal Gland Sample A	21.6254	
GSM27186	Male Placebo-Treated Lacrimal Gland Sample B	15.916	p < 0.05
GSM27187	Male Placebo-Treated Lacrimal Gland Sample C	14.0492	
GSM27188	Male Testosterone-Treated Lacrimal Gland Sample A		5.04977
GSM27189	Male Testosterone-Treated Lacrimal Gland Sample B		6.27436
GSM27190	Male Testosterone-Treated Lacrimal Gland Sample C		6.81647
GSM27197	Male Placebo-Treated Submandibular Gland Sample A	1.62319	
GSM27198	Male Placebo-Treated Submandibular Gland Sample B	1.54446	p < 0.05
GSM27199	Male Placebo-Treated Submandibular Gland Sample C	1.27973	
GSM27200	Male Testosterone-Treated Submandibular Gland Sample A		4.75181
GSM27201	Male Testosterone-Treated Submandibular Gland Sample B		2.12511
GSM27202	Male Testosterone-Treated Submandibular Gland Sample C		3.60242
GSM27191	Male Placebo-Treated Meibomian Gland Sample A	4.08816	
GSM27192	Male Placebo-Treated Meibomian Gland Sample B	4.09734	
GSM27193	Male Placebo-Treated Meibomian Gland Sample C	4.58029	
GSM27194	Male Testosterone-Treated Meibomian Gland Sample A	3.08708	
GSM27195	Male Testosterone-Treated Meibomian Gland Sample B	3.88995	
GSM27196	Male Testosterone-Treated Meibomian Gland Sample C	4.22759	

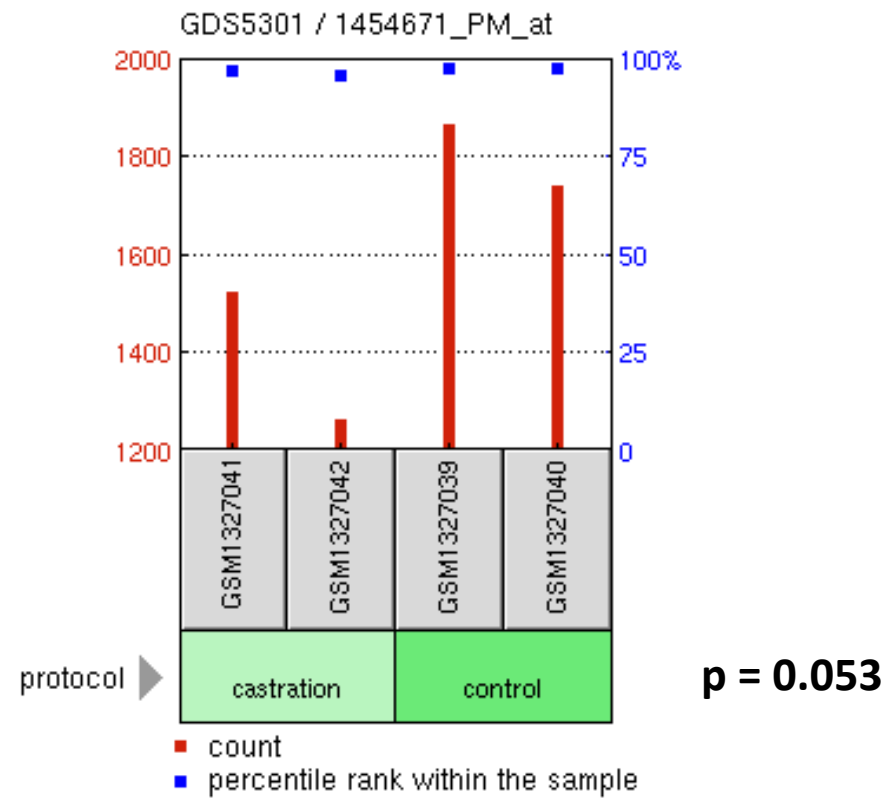
Profile: *HMGA2* expression
GDS5301 / 1450780_PM_s_at
Title
Androgen deprivation effect on
CD4 T-cells
Organism
Mus musculus



Castration decreases *HMGA2* expression

Sample	Title	Value
GSM1327041	Cast_1	12.6312
GSM1327042	Cast_2	13.2155
GSM1327039	Sham_1	16.7133
GSM1327040	Sham_2	15.4878

Profile: *INSIG1* expression
 GDS5301 / 1454671_PM_at
 Title
 Androgen deprivation effect on
 CD4 T-cells
 Organism
 Mus musculus



Castration decreases *INSIG1* expression

Sample	Title	Value
GSM1327041	Cast_1	1525.05
GSM1327042	Cast_2	1265.23
GSM1327039	Sham_1	1866.04
GSM1327040	Sham_2	1741.1

Profile: *GATA5* expression

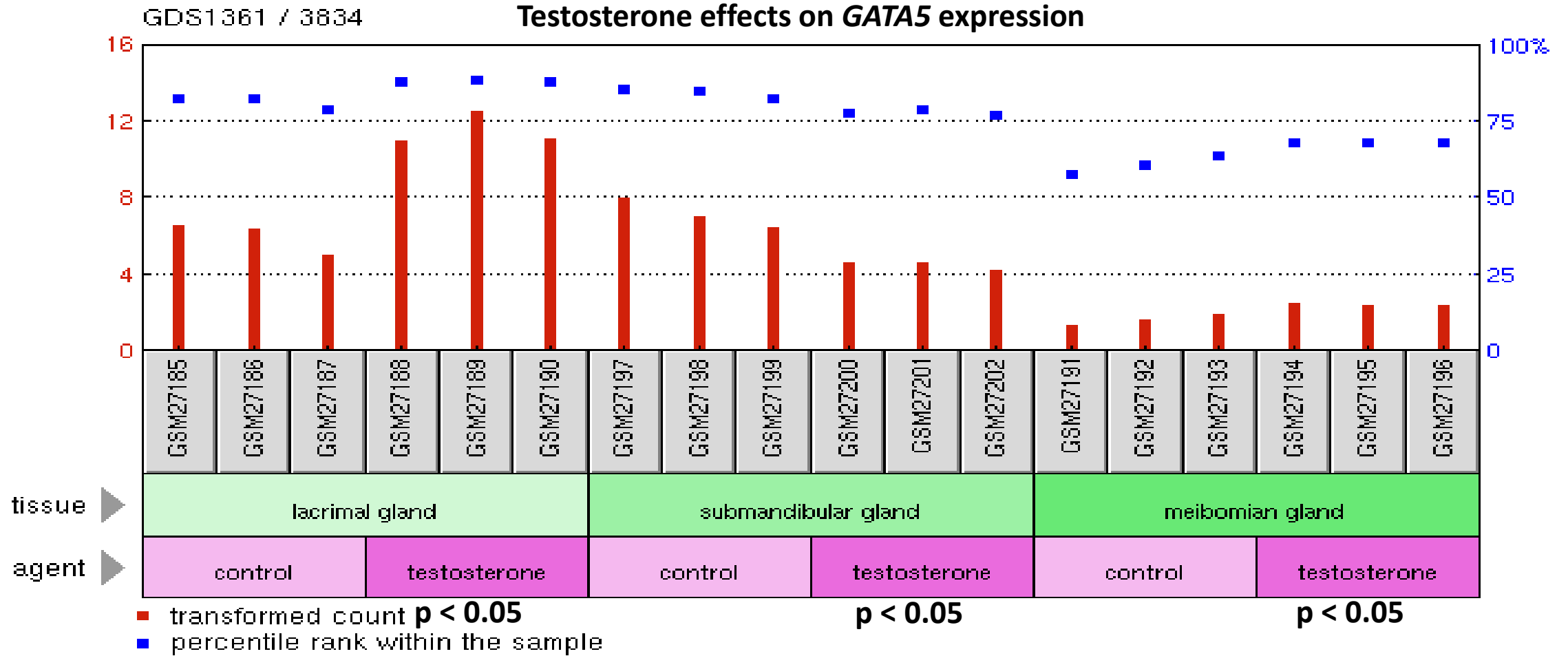
GDS1361 / 3834

Title

Testosterone effect on meibomian gland

Organism

Mus musculus



Profile: *GATA5* expression**GDS1361 / 3834****Title****Testosterone effect on meibomian gland****Organism****Mus musculus****Testosterone effects on *GATA5* expression**

Sample	Title	Value
GSM27185	Male Placebo-Treated Lacrimal Gland Sample A	6.64621
GSM27186	Male Placebo-Treated Lacrimal Gland Sample B	6.45423 p < 0.05
GSM27187	Male Placebo-Treated Lacrimal Gland Sample C	5.10327
GSM27188	Male Testosterone-Treated Lacrimal Gland Sample A	10.9893
GSM27189	Male Testosterone-Treated Lacrimal Gland Sample B	12.5373
GSM27190	Male Testosterone-Treated Lacrimal Gland Sample C	11.1312
GSM27197	Male Placebo-Treated Submandibular Gland Sample A	8.00934
GSM27198	Male Placebo-Treated Submandibular Gland Sample B	7.04778 p < 0.05
GSM27199	Male Placebo-Treated Submandibular Gland Sample C	6.52222
GSM27200	Male Testosterone-Treated Submandibular Gland Sample A	4.71727
GSM27201	Male Testosterone-Treated Submandibular Gland Sample B	4.67808
GSM27202	Male Testosterone-Treated Submandibular Gland Sample C	4.25649
GSM27191	Male Placebo-Treated Meibomian Gland Sample A	1.42448
GSM27192	Male Placebo-Treated Meibomian Gland Sample B	1.65382 p < 0.05
GSM27193	Male Placebo-Treated Meibomian Gland Sample C	1.92874
GSM27194	Male Testosterone-Treated Meibomian Gland Sample A	2.54996
GSM27195	Male Testosterone-Treated Meibomian Gland Sample B	2.49176
GSM27196	Male Testosterone-Treated Meibomian Gland Sample C	2.45951

ACE2 and FURIN

Supplemental Figure S12. Potential mechanisms affecting gene expression inferred from transgenic mouse models and observed in pathophysiologically & therapeutically relevant mouse and human cells:

A knowledge path toward potential therapy-enhancing interventions

Profile: ACE2 expression

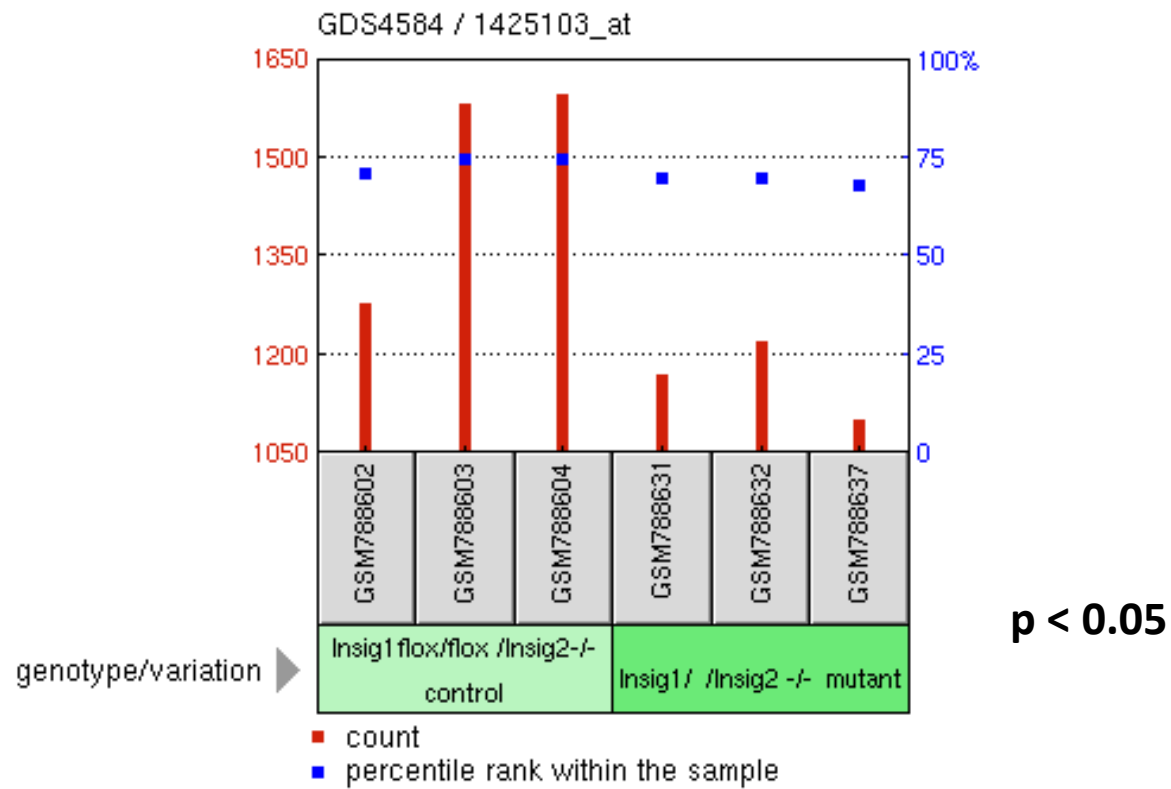
GDS4584 / 1425103_at

Title

Alveolar type I cells deficient in sterol-response element-binding proteins inhibitor Insig1/2

Organism

Mus musculus



Insig1: a candidate activator of the *ACE2* expression

Sample	Title	Value
GSM788602	Insig1 flox/flox /Insig2 -/- InsigKO_C1	1279.8
GSM788603	Insig1 flox/flox /Insig2 -/- InsigKO_C2	1584.9
GSM788604	Insig1 flox/flox /Insig2 -/- InsigKO_C3	1596
GSM788631	Insig1 Δ/Δ /Insig2 -/- InsigKO_E1	1169.8
GSM788632	Insig1 Δ/Δ /Insig2 -/- InsigKO_E2	1223
GSM788637	Insig1 Δ/Δ /Insig2 -/- InsigKO_E3	1102.8

Profile: ACE2 expression

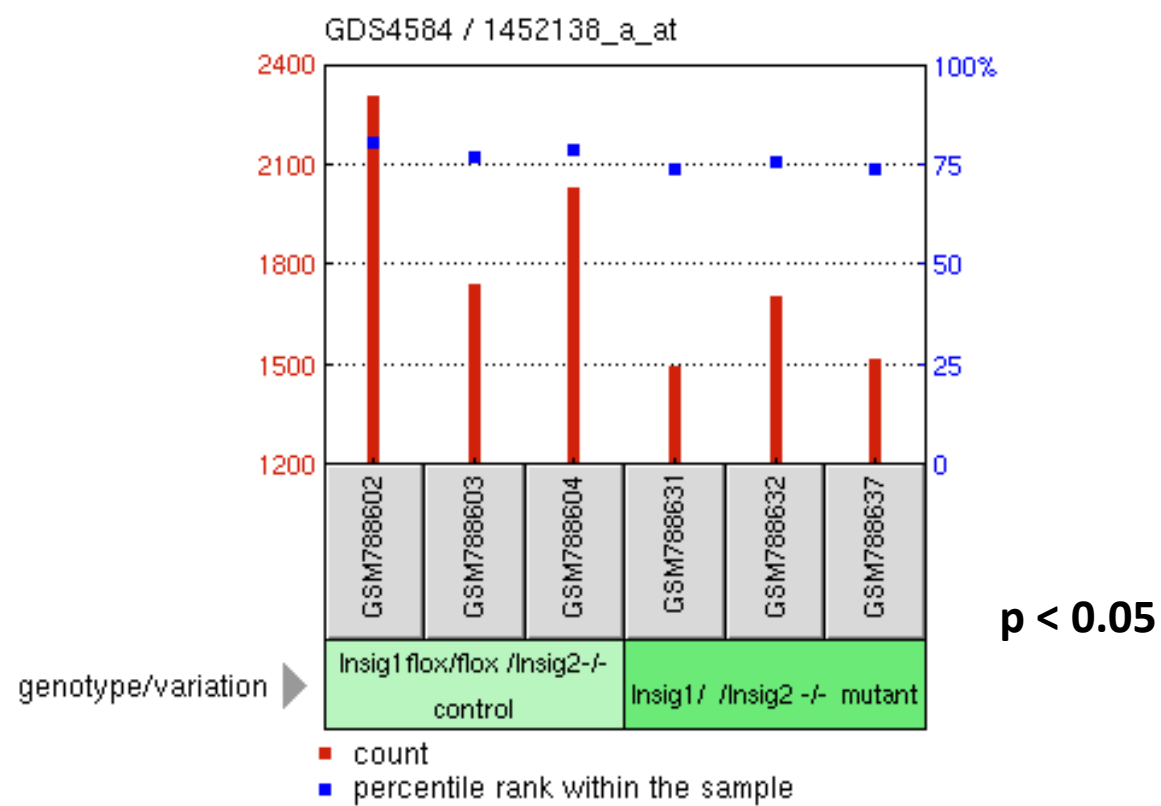
GDS4584 / 1452138_a_at

Title

Alveolar type I cells deficient in sterol-response element-binding proteins inhibitor *Insig1/2*

Organism

Mus musculus



Insig1: a candidate activator of the *ACE2* expression

Sample	Title	Value
GSM788602	Insig1 flox/flox /Insig2 -/- InsigKO_C1	2309.1
GSM788603	Insig1 flox/flox /Insig2 -/- InsigKO_C2	1742.5
GSM788604	Insig1 flox/flox /Insig2 -/- InsigKO_C3	2032.3
GSM788631	Insig1 Δ/Δ /Insig2 -/- InsigKO_E1	1496.5
GSM788632	Insig1 Δ/Δ /Insig2 -/- InsigKO_E2	1706.9
GSM788637	Insig1 Δ/Δ /Insig2 -/- InsigKO_E3	1518.6

Profile: *INSIG1* expression

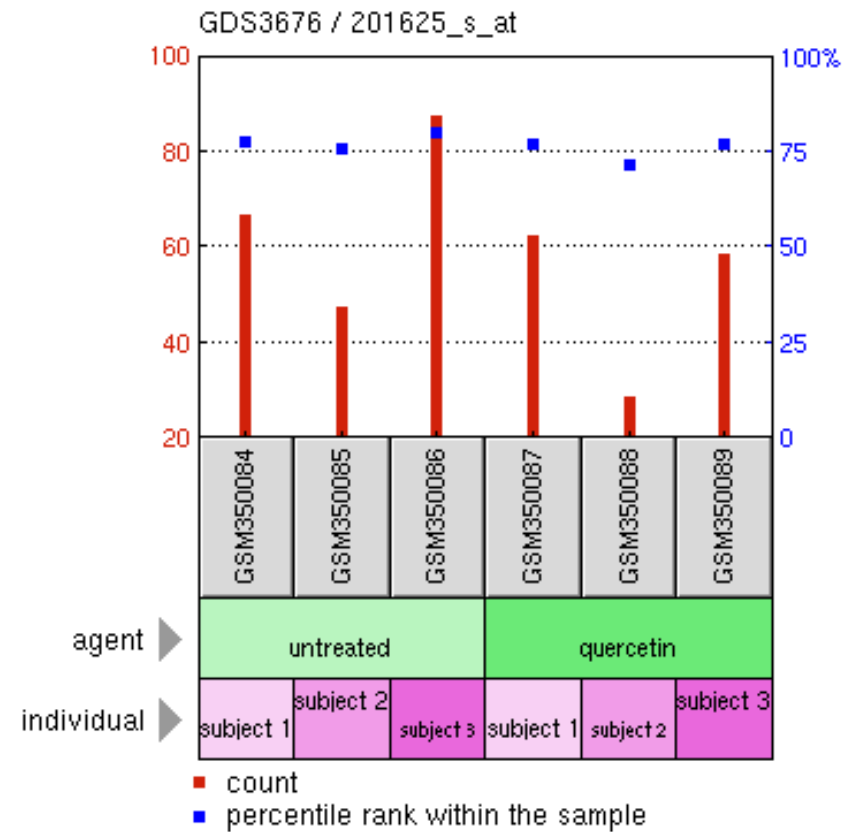
GDS3676 / 201625_s_at

Title

Quercetin effect on CD14+ monocyte

Organism

Homo sapiens



Quercetin inhibits the *INSIG1* expression

Sample	Title	Value	Percent changes
GSM350084	CD14+ at baseline, biological replicate 1	66.9724	
GSM350085	CD14+ at baseline, biological replicate 2	47.9219	
GSM350086	CD14+ at baseline, biological replicate 3	87.5973	
GSM350087	CD14+ after 2 wk quercetin supplementation, biological replicate 1	62.5927	- 7%
GSM350088	CD14+ after 2 wk quercetin supplementation, biological replicate 2	28.8386	- 40%
GSM350089	CD14+ after 2 wk quercetin supplementation, biological replicate 3	58.8768	- 33%

Profile: *HIF1a* expression

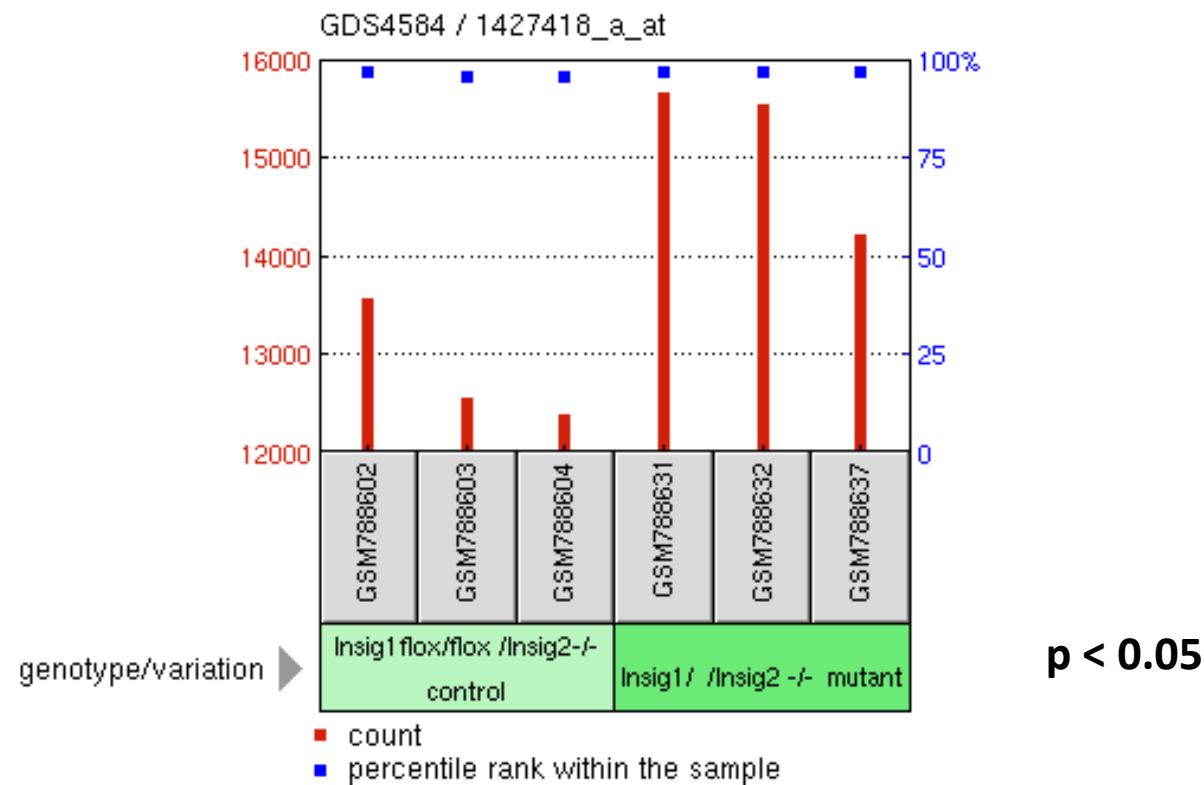
GDS4584 / 1427418_a_at

Title

Alveolar type I cells deficient in sterol-response element-binding proteins inhibitor *Insig1/2*

Organism

Mus musculus



Insig1: a candidate repressor of the *HIF1a* expression

Sample	Title	Value
GSM788602	Insig1 flox/flox /Insig2 -/- InsigKO_C1	13581.9
GSM788603	Insig1 flox/flox /Insig2 -/- InsigKO_C2	12568
GSM788604	Insig1 flox/flox /Insig2 -/- InsigKO_C3	12390.1
GSM788631	Insig1 Δ/Δ /Insig2 -/- InsigKO_E1	15685.4
GSM788632	Insig1 Δ/Δ /Insig2 -/- InsigKO_E2	15544.2
GSM788637	Insig1 Δ/Δ /Insig2 -/- InsigKO_E3	14222.5

Profile: *HIF1α* expression

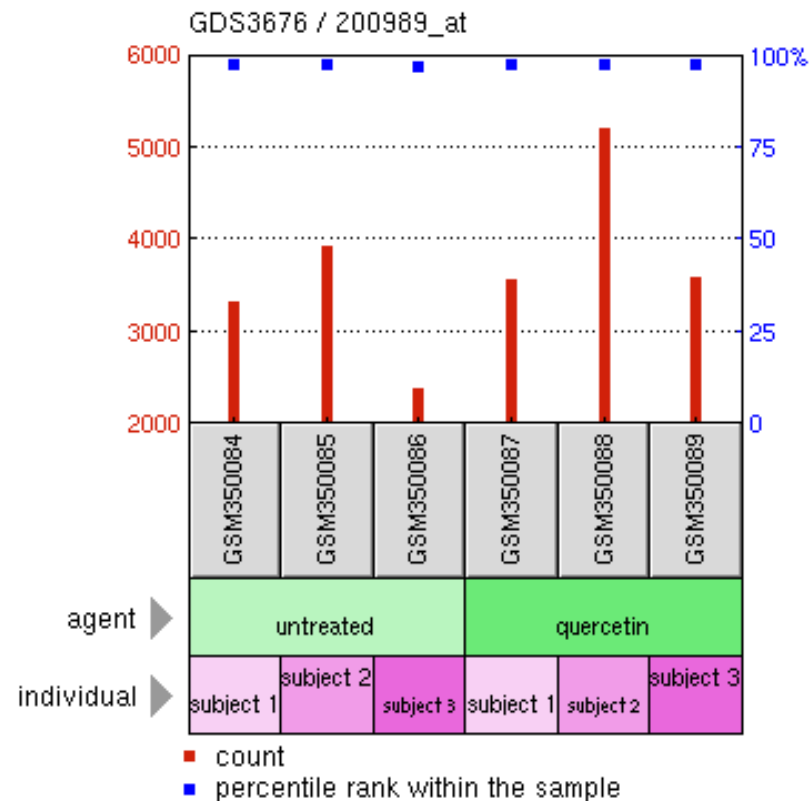
GDS3676 / 200989_at

Title

Quercetin effect on CD14+ monocyte

Organism

Homo sapiens



Quercetin activates the *HIF1α* expression

Sample	Title	Value
GSM350084	CD14+ at baseline, biological replicate 1	3338.47
GSM350085	CD14+ at baseline, biological replicate 2	3929.88
GSM350086	CD14+ at baseline, biological replicate 3	2388.45
GSM350087	CD14+ after 2 wk quercetin supplementation, biological replicate 1	3577.94 (+ 7.2%)
GSM350088	CD14+ after 2 wk quercetin supplementation, biological replicate 2	5206.25 (+32.5%)
GSM350089	CD14+ after 2 wk quercetin supplementation, biological replicate 3	3604.21 (+50.9%)

Profile: *HIF1A* expression

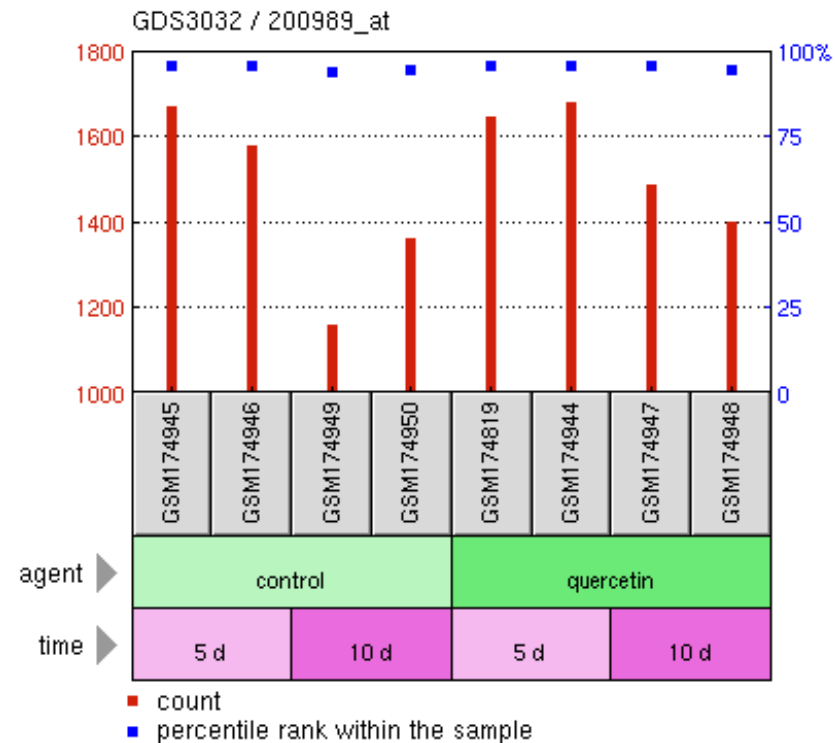
GDS3032 / 200989_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Quercetin ameliorates decline of the *HIF1a* expression

Sample	Title	Value	
GSM174945	Control day 05 sample 1	1673.78	} 1628
GSM174946	Control day 05 sample 2	1582.51	
GSM174949	Control day 10 sample 1	1163.29	} 1264 (-22.4%)
GSM174950	Control day 10 sample 2	1364.98	
GSM174819	Quercetin day 05 sample 1	1646.59	} 1663
GSM174944	Quercetin day 05 sample 2	1680.64	
GSM174947	Quercetin day 10 sample 1	1491.23	} 1447 (-13.0%)
GSM174948	Quercetin day 10 sample 2	1403.56	

Profile: ACE2

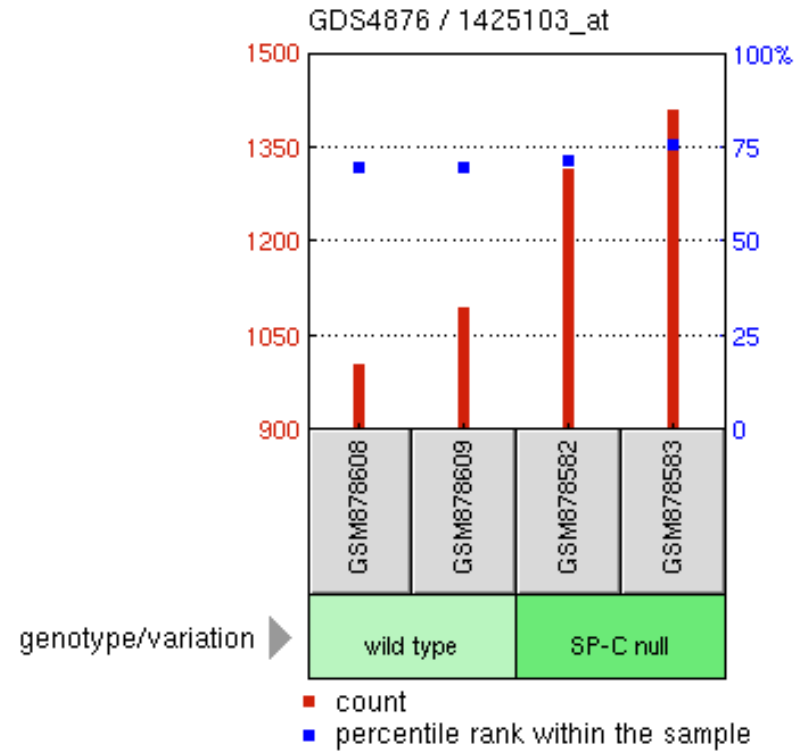
GDS4876 / 1425103_at

Title

**Pulmonary surfactant protein-C
deficiency effect on alveolar type II
epithelial cell**

Organism

Mus musculus



SP-C (SFTPC): a candidate inhibitor of the ACE2 expression

Sample	Title	Value
GSM878608	Wild-type Type II 1_8_9_04	1006
GSM878609	Wild-type Type II 9_27_04	1097.9
GSM878582	KO SPC Type II 9_27_04	1317.1
GSM878583	KO SPC Type II 2_8_9_04	1413.2

Profile: **FURIN** expression

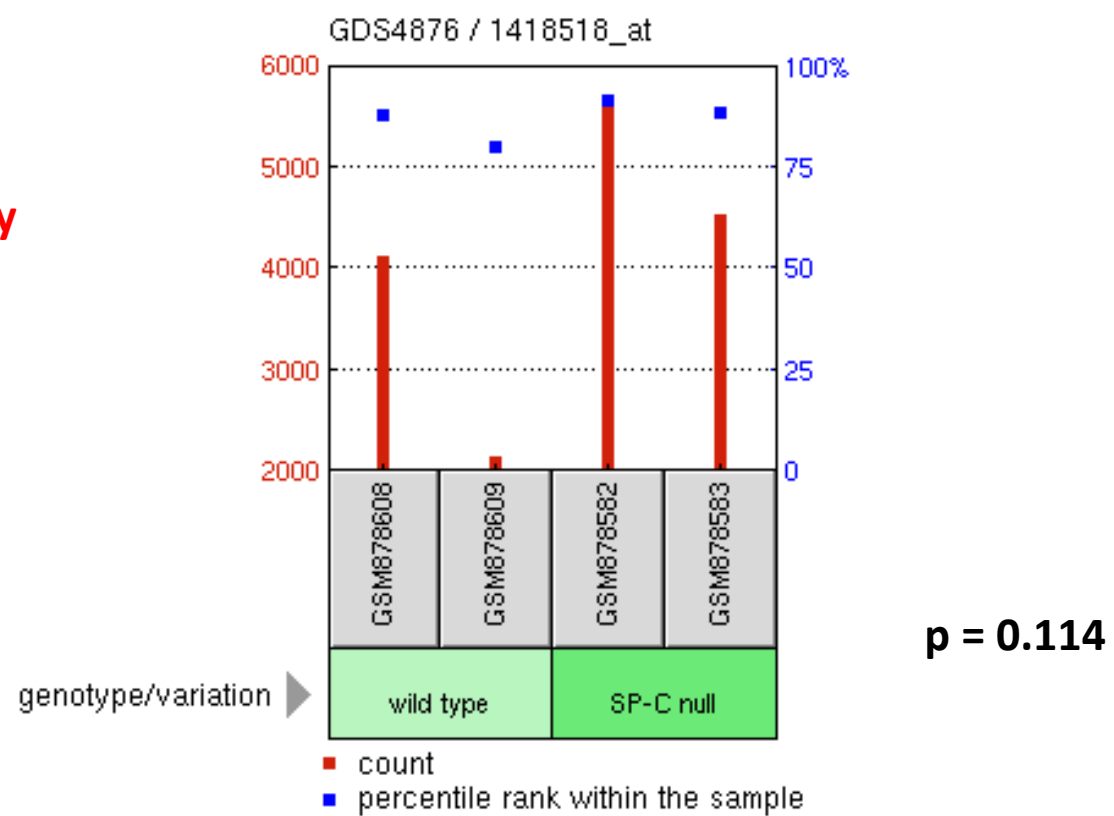
GDS4876 / 1418518_at

Title

**Pulmonary surfactant protein-C deficiency
effect on alveolar type II epithelial cell**

Organism

Mus musculus



SP-C (SFTPC): a candidate inhibitor of the FURIN expression

Sample	Title	Value
GSM878608	Wild-type Type II 1_8_9_04	4141.2
GSM878609	Wild-type Type II 9_27_04	2156.1
GSM878582	KO SPC Type II 9_27_04	5733
GSM878583	KO SPC Type II 2_8_9_04	4537.4

Profile: SP-C (SFTPC) expression

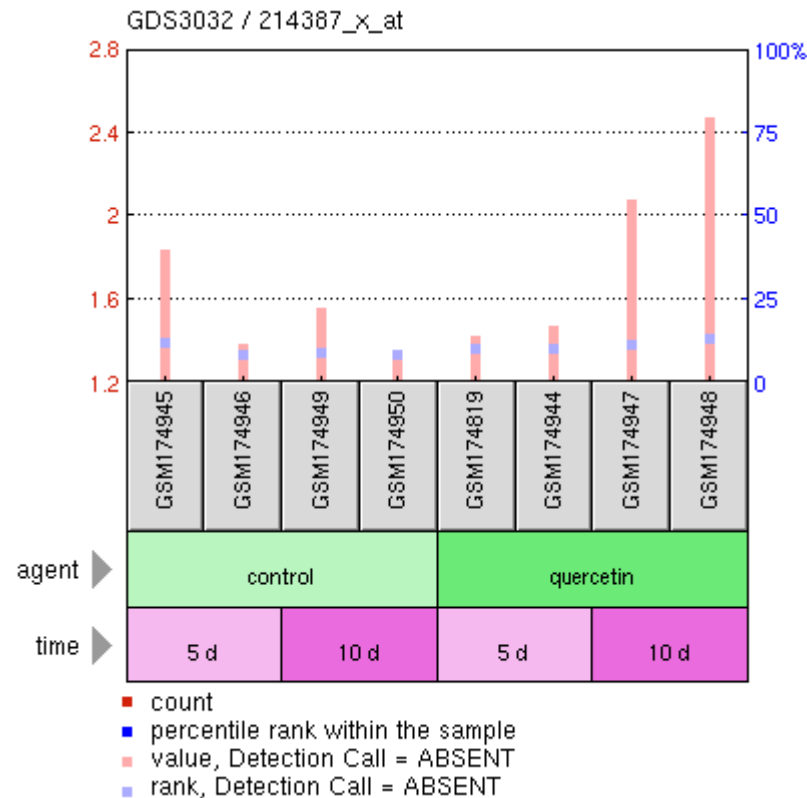
GDS3032 / 214387_x_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Quercetin enhances the SP-1 (SFTPC) expression

Sample	Title	Value
GSM174945	Control day 05 sample 1	1.84127
GSM174946	Control day 05 sample 2	1.38638
GSM174949	Control day 10 sample 1	1.56441
GSM174950	Control day 10 sample 2	1.35256
GSM174819	Quercetin day 05 sample 1	1.42897
GSM174944	Quercetin day 05 sample 2	1.47099
GSM174947	Quercetin day 10 sample 1	2.08499
GSM174948	Quercetin day 10 sample 2	2.47973

Profile: SP-C (SFTPC) expression

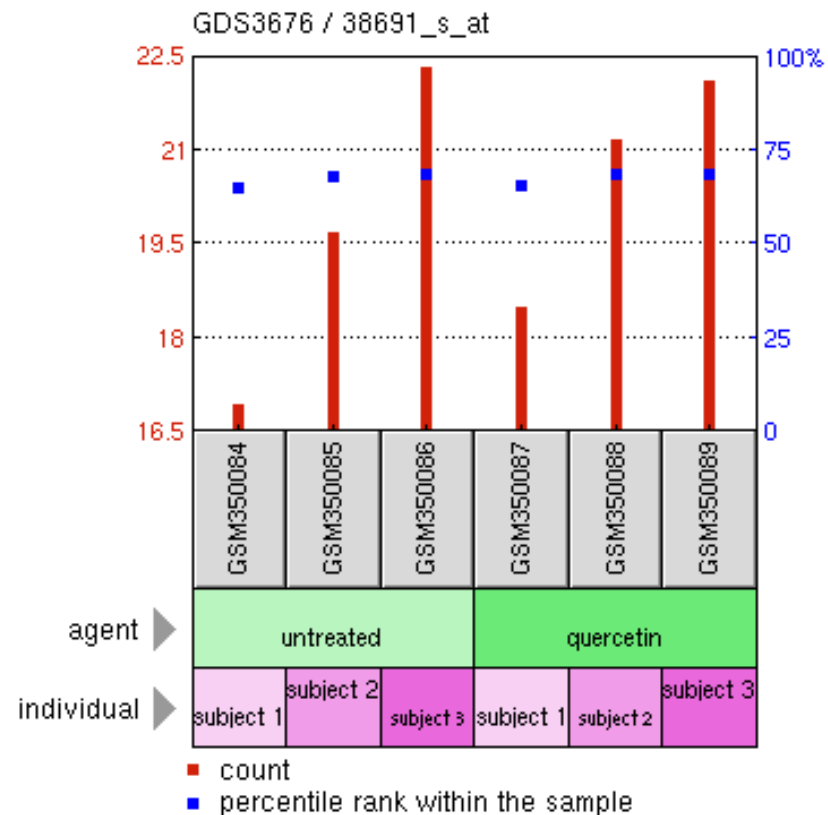
GDS3676 / 38691_s_at

Title

Quercetin effect on CD14+ monocyte

Organism

Homo sapiens



Quercetin enhances the *SP-1 (SFTPC)* expression

Sample	Title	Value
GSM350084	CD14+ at baseline, biological replicate 1	16.9619
GSM350085	CD14+ at baseline, biological replicate 2	19.6833
GSM350086	CD14+ at baseline, biological replicate 3	22.3292
GSM350087	CD14+ after 2 wk quercetin supplementation, biological replicate 1	18.5089
GSM350088	CD14+ after 2 wk quercetin supplementation, biological replicate 2	21.1853
GSM350089	CD14+ after 2 wk quercetin supplementation, biological replicate 3	22.11

Profile: ACE2 expression

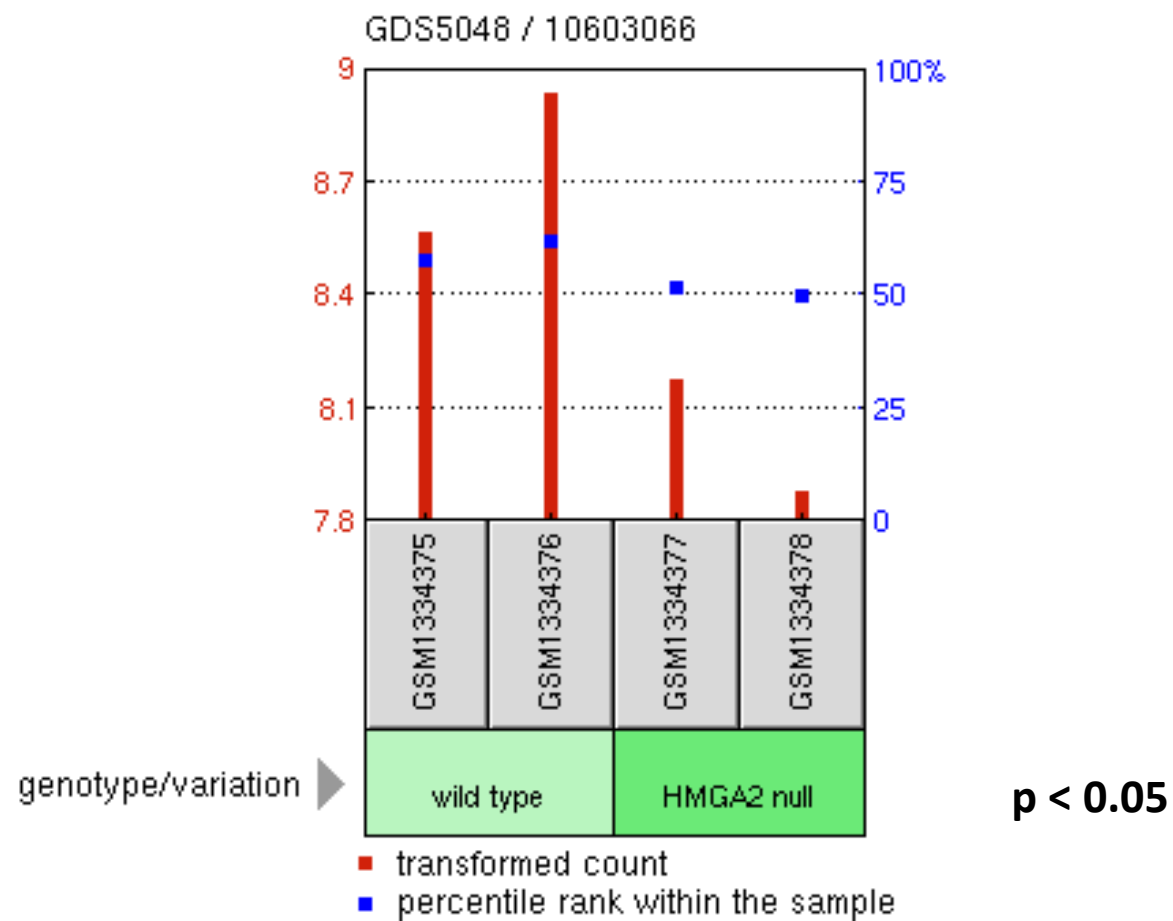
GDS5048 / 10603066

Title

High Mobility Group AT-hook Protein 2
deficiency effect on the embryonic
lung

Organism

Mus musculus



HMGA2: a candidate activator of the ACE2 expression

Sample	Title	Value
GSM1334375	E18.5 lung WT1, biological rep1	8.57131
GSM1334376	E18.5 lung WT1, biological rep2	8.93831
GSM1334377	E18.5 lung KO1, biological rep1	8.18208
GSM1334378	E18.5 lung KO2, biological rep2	7.87966

Profile: *INSIG1* expression

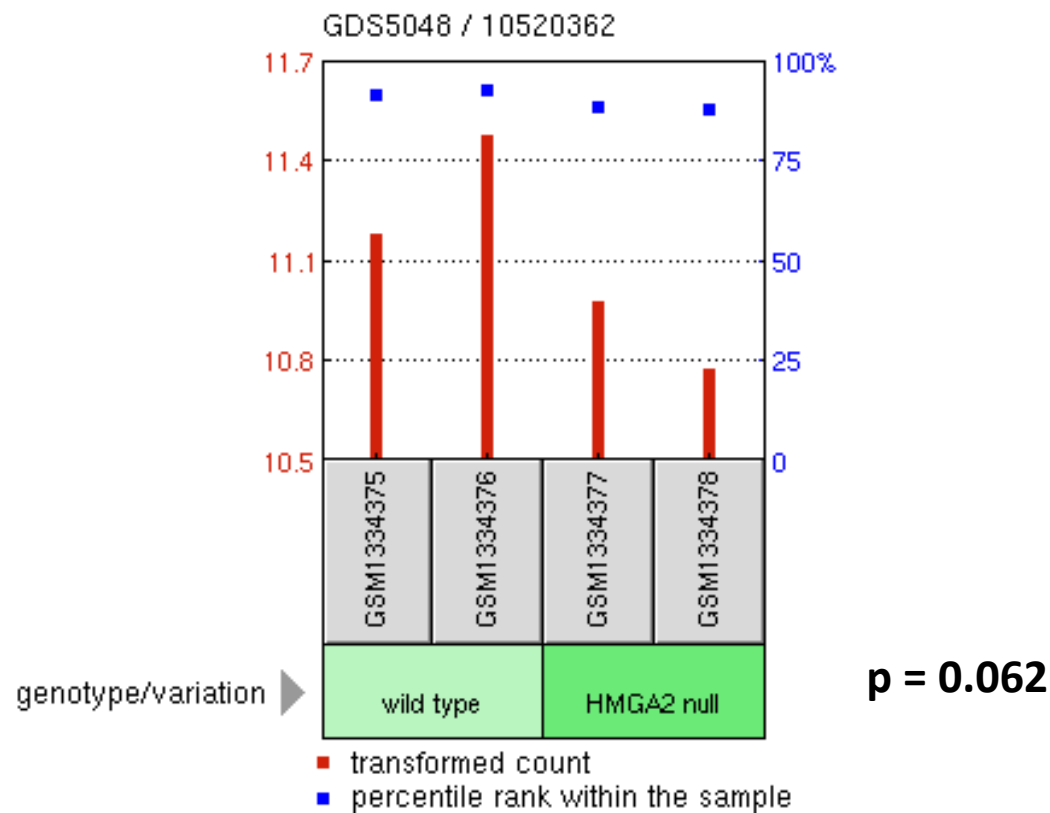
GDS5048 / 10520362

Title

High Mobility Group AT-hook Protein 2
deficiency effect on the embryonic lung

Organism

Mus musculus



HMGA2: a candidate activator of the *INSIG1* expression

Sample	Title	Value
GSM1334375	E18.5 lung WT1, biological rep1	11.1863
GSM1334376	E18.5 lung WT1, biological rep2	11.4769
GSM1334377	E18.5 lung KO1, biological rep1	10.9789
GSM1334378	E18.5 lung KO2, biological rep2	10.7801

Profile: *SFTPC* expression

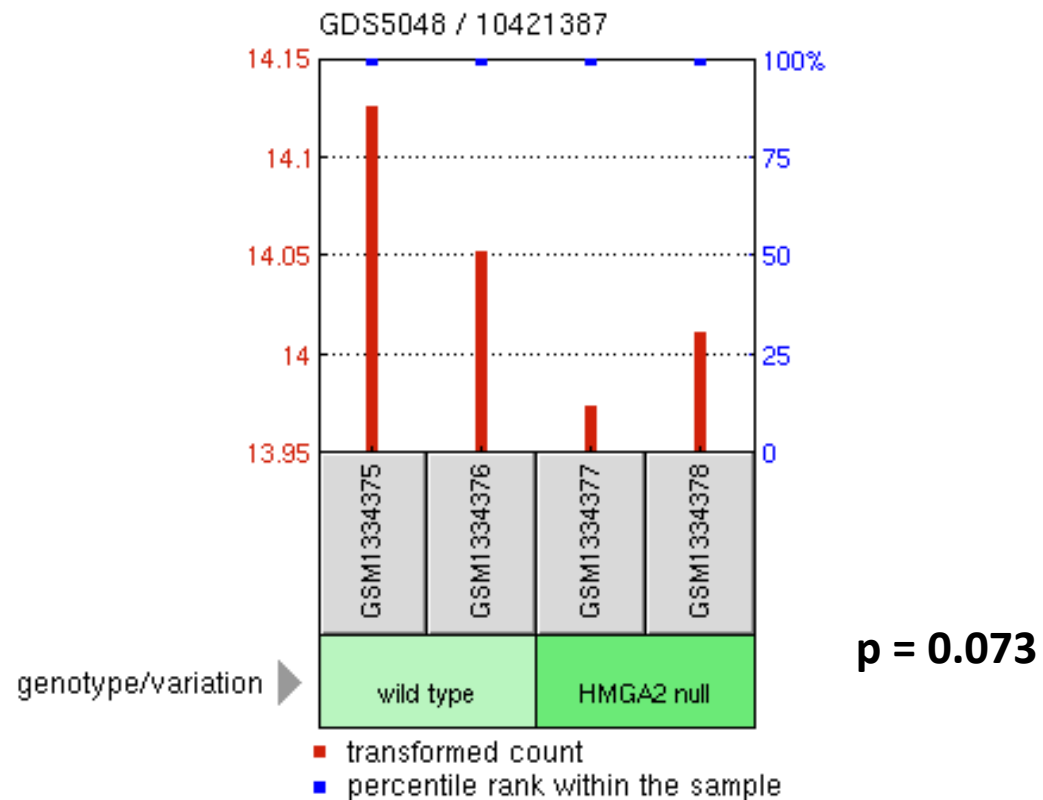
GDS5048 / 10421387

Title

High Mobility Group AT-hook Protein 2 deficiency effect on the embryonic lung

Organism

Mus musculus



HMGA2: a candidate activator of the *SFTPC* expression

Sample	Title	Value
GSM1334375	E18.5 lung WT1, biological rep1	14.1269
GSM1334376	E18.5 lung WT1, biological rep2	14.0528
GSM1334377	E18.5 lung KO1, biological rep1	13.975
GSM1334378	E18.5 lung KO2, biological rep2	14.0121

Profile: HMGA2 expression

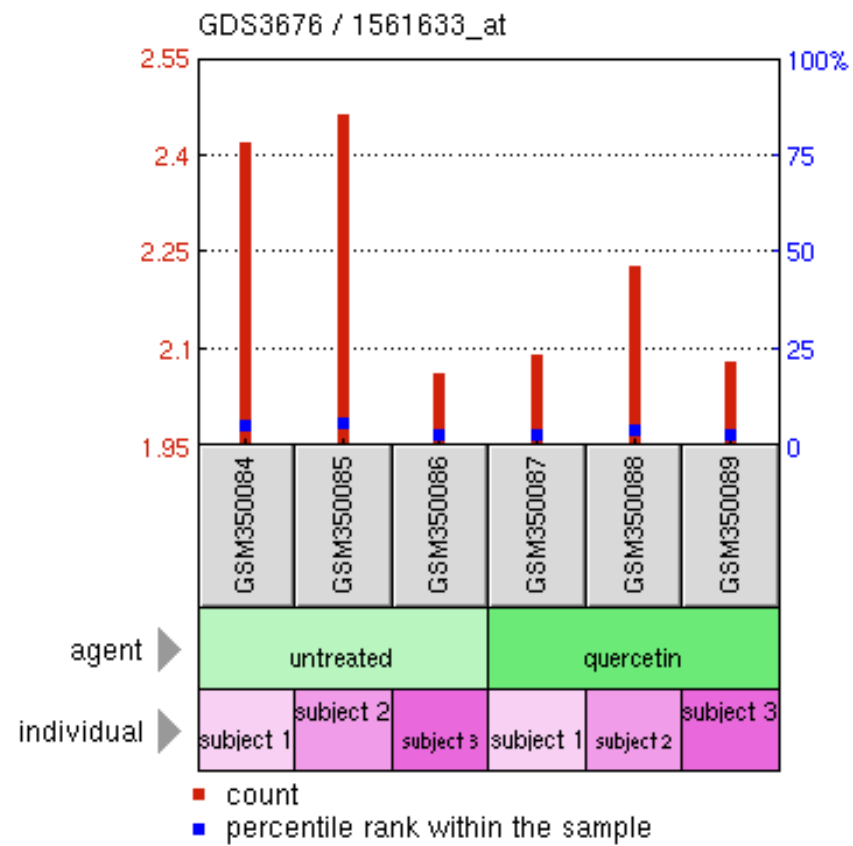
GDS3676 / 1561633_at

Title

Quercetin effect on CD14+ monocyte

Organism

Homo sapiens



Quercetin inhibits the *HMGA2* expression

Sample	Title	Value
GSM350084	CD14+ at baseline, biological replicate 1	2.4219
GSM350085	CD14+ at baseline, biological replicate 2	2.46504
GSM350086	CD14+ at baseline, biological replicate 3	2.06307
GSM350087	CD14+ after 2 wk quercetin supplementation, biological replicate 1	2.09436
GSM350088	CD14+ after 2 wk quercetin supplementation, biological replicate 2	2.22984
GSM350089	CD14+ after 2 wk quercetin supplementation, biological replicate 3	2.0814

Profile: HMGA2 expression

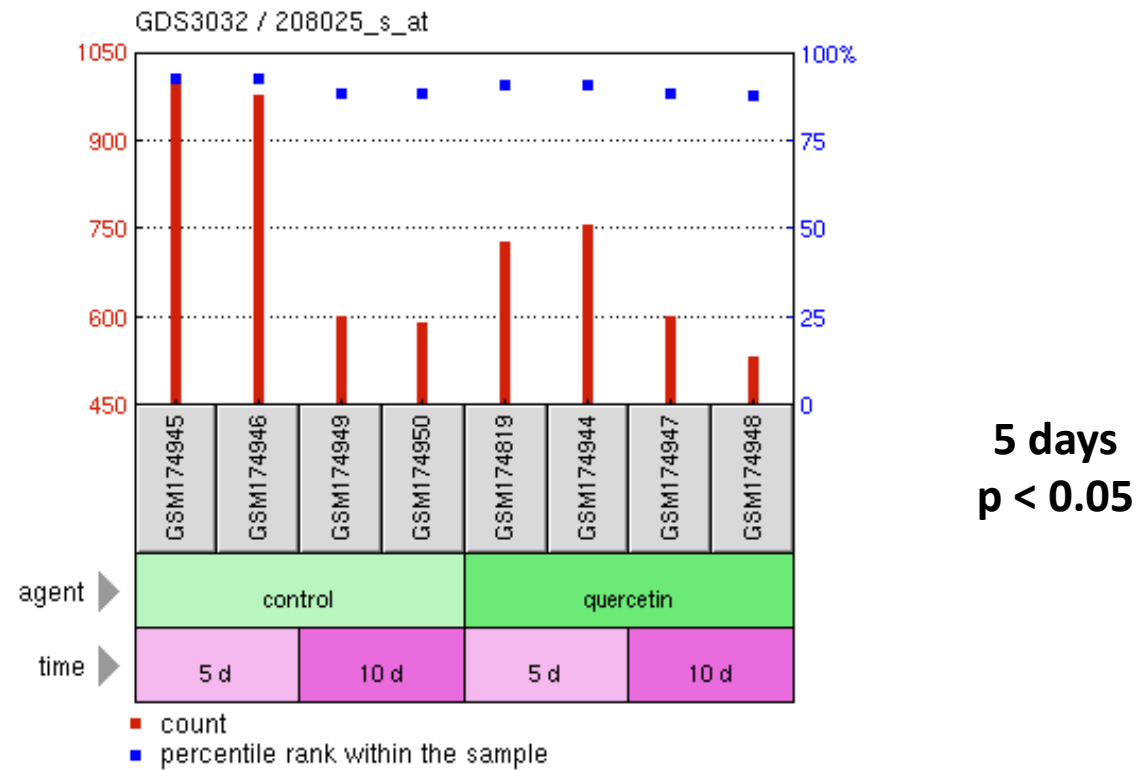
GDS3032 / 208025_s_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Quercetin inhibits the *HMGA2* expression

Sample	Title	Value
GSM174945	Control day 05 sample 1	1015.28
GSM174946	Control day 05 sample 2	977.764
GSM174949	Control day 10 sample 1	601.884
GSM174950	Control day 10 sample 2	591.613
GSM174819	Quercetin day 05 sample 1	729.032
GSM174944	Quercetin day 05 sample 2	758.127
GSM174947	Quercetin day 10 sample 1	602.964
GSM174948	Quercetin day 10 sample 2	535.877

Profile: HMGA2 expression

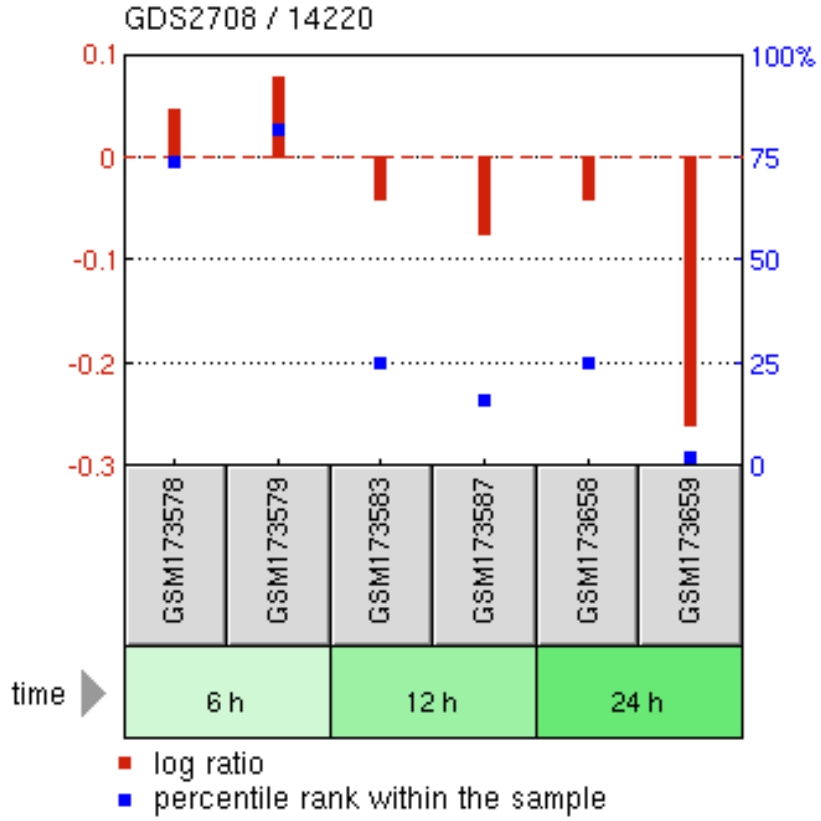
GDS2708 / 14220

Title

Quercetin effect on cultured cardiomyocytes: time course

Organism

Rattus norvegicus



p < 0.05

Quercetin inhibits the *HMGA2* expression

Sample	Title	Value
GSM173578	Quercetin treated cardiomyocytes for 6 hours (Q6-A).	0.0475828
GSM173579	Quercetin treated cardiomyocytes for 6 hours (Q6-B).	0.0794489
GSM173583	Quercetin treated cardiomyocytes for 12 hours (Q12-A).	-0.0439453
GSM173587	Quercetin treated cardiomyocytes for 12 hours (Q12-B).	-0.078307
GSM173658	Quercetin treated cardiomyocytes for 24 hours (Q24-A).	-0.0439453
GSM173659	Quercetin treated cardiomyocytes for 24 hours (Q24-B).	-0.262591

Profile: *HMGA2* expression

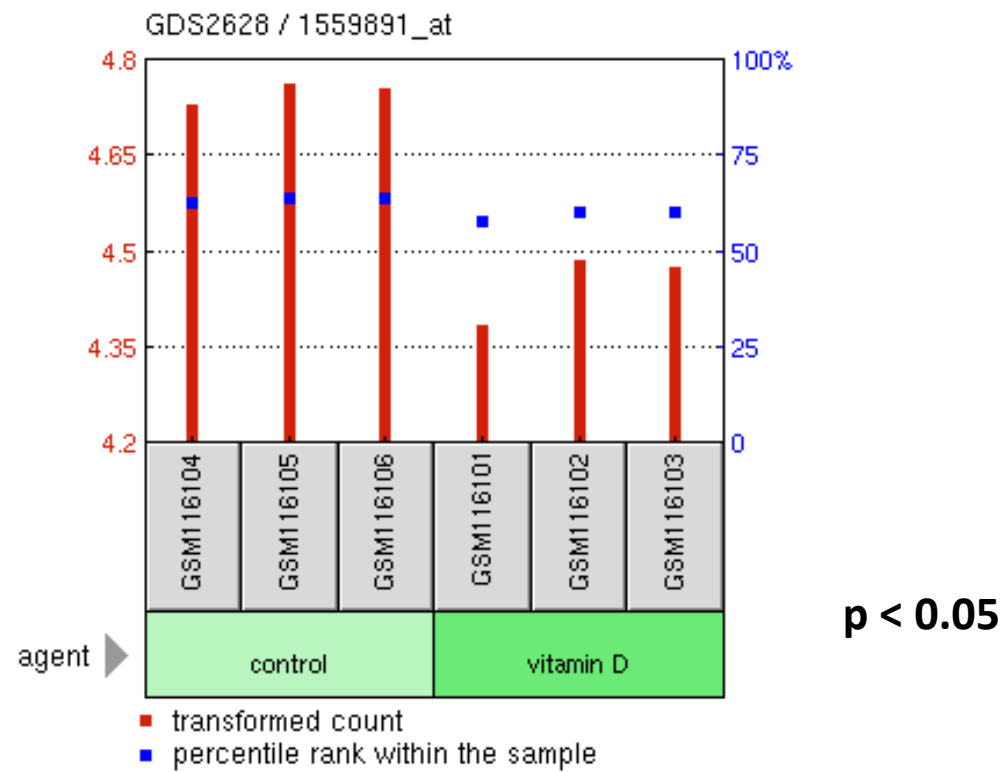
GDS2628 / 1559891_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

Homo sapiens



Vitamin D inhibits the *HMGA2* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	4.73008
GSM116105	hBSMC_control_rep2	4.7629
GSM116106	hBSMC_control_rep3	4.75495
GSM116101	hBSMC_vitamin D_rep1	4.38522
GSM116102	hBSMC_vitamin D_rep2	4.48749
GSM116103	hBSMC_vitamin D_rep3	4.47664

Profile: *HMGA2* expression

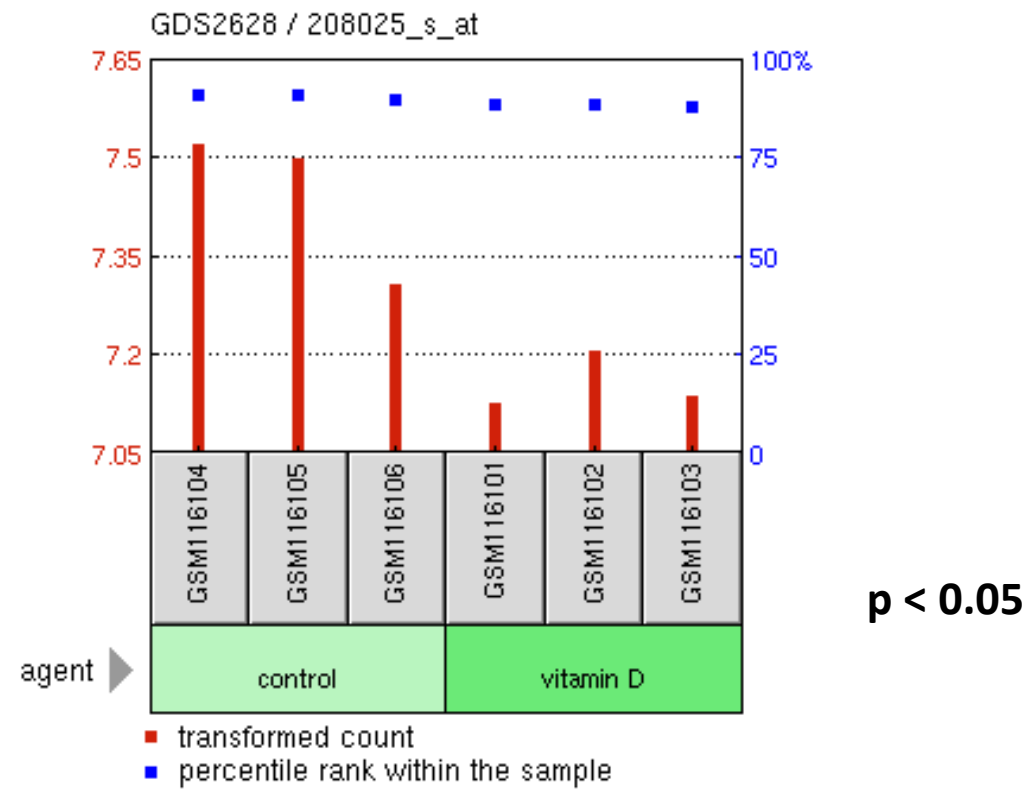
GDS2628 / 208025_s_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

Homo sapiens



Vitamin D inhibits the *HMGA2* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	7.52243
GSM116105	hBSMC_control_rep2	7.50027
GSM116106	hBSMC_control_rep3	7.3098
GSM116101	hBSMC_vitamin D_rep1	7.12949
GSM116102	hBSMC_vitamin D_rep2	7.20614
GSM116103	hBSMC_vitamin D_rep3	7.13995

Profile: ACE2 expression

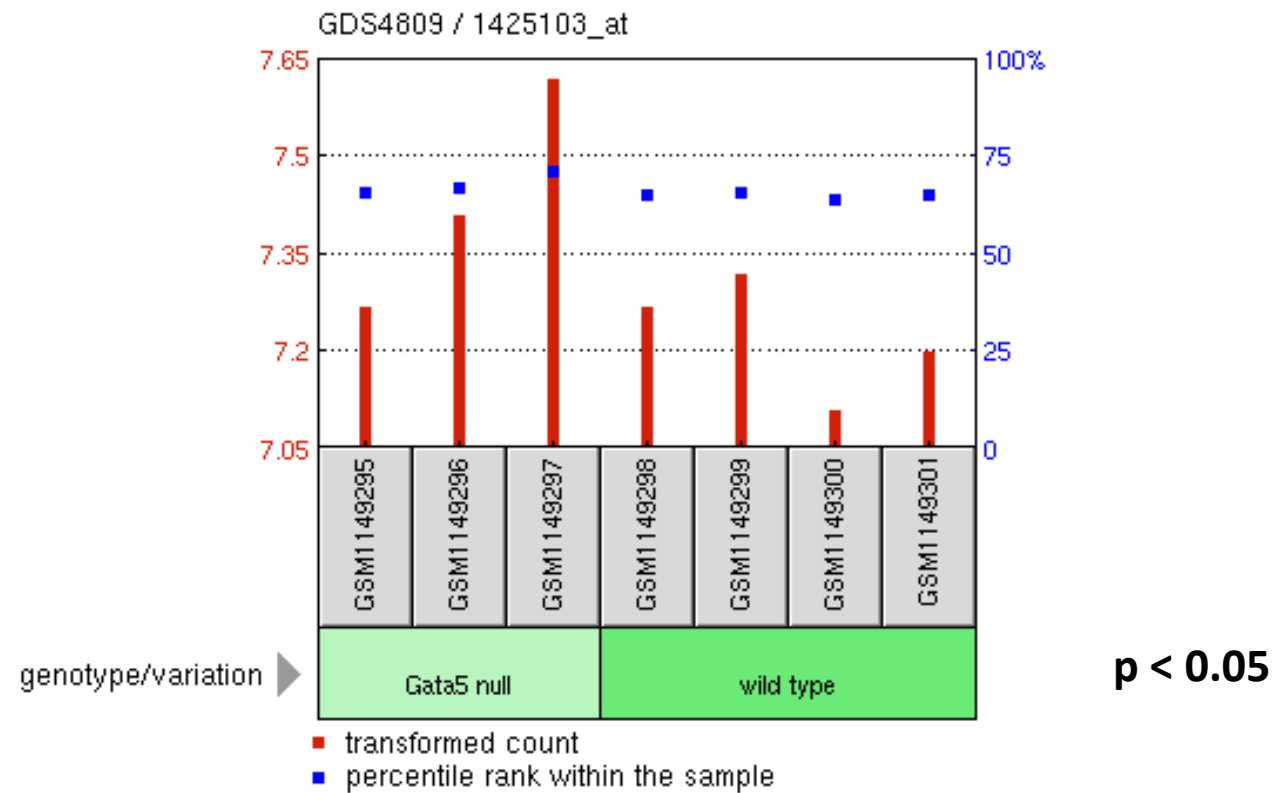
GDS4809 / 1425103_at

Title

Gata5 deficiency effect on the lung

Organism

Mus musculus



***GATA5*: a candidate inhibitor of the *ACE2* expression**

Sample	Title	Value
GSM1149295	KO618	7.27
GSM1149296	KO621	7.41
GSM1149297	KO624	7.62
GSM1149298	WT619	7.27
GSM1149299	WT623	7.32
GSM1149300	WT648	7.11
GSM1149301	WT659	7.2

Profile: *VDR* expression

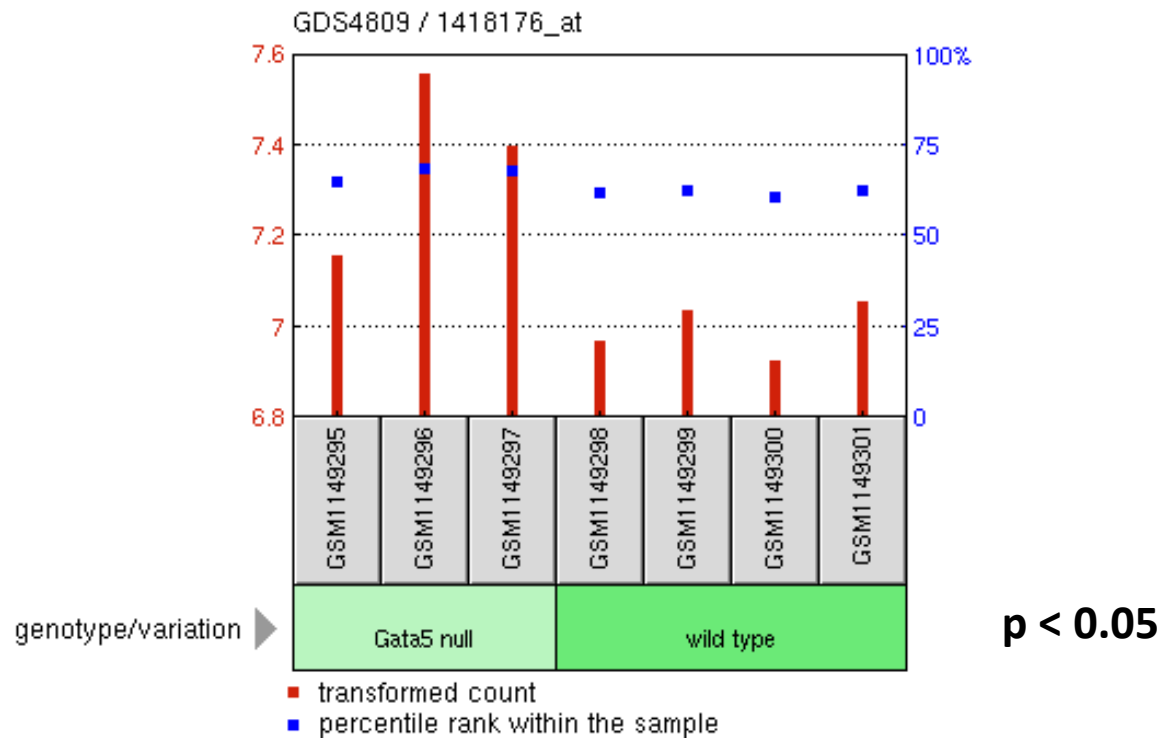
GDS4809 / 1418176_at

Title

Gata5 deficiency effect on the lung

Organism

Mus musculus



GATA5: a candidate inhibitor of the *VDR* expression

Sample	Title	Value
GSM1149295	KO618	7.16
GSM1149296	KO621	7.56
GSM1149297	KO624	7.4
GSM1149298	WT619	6.97
GSM1149299	WT623	7.04
GSM1149300	WT648	6.93
GSM1149301	WT659	7.06

Profile: *SFTPC* expression

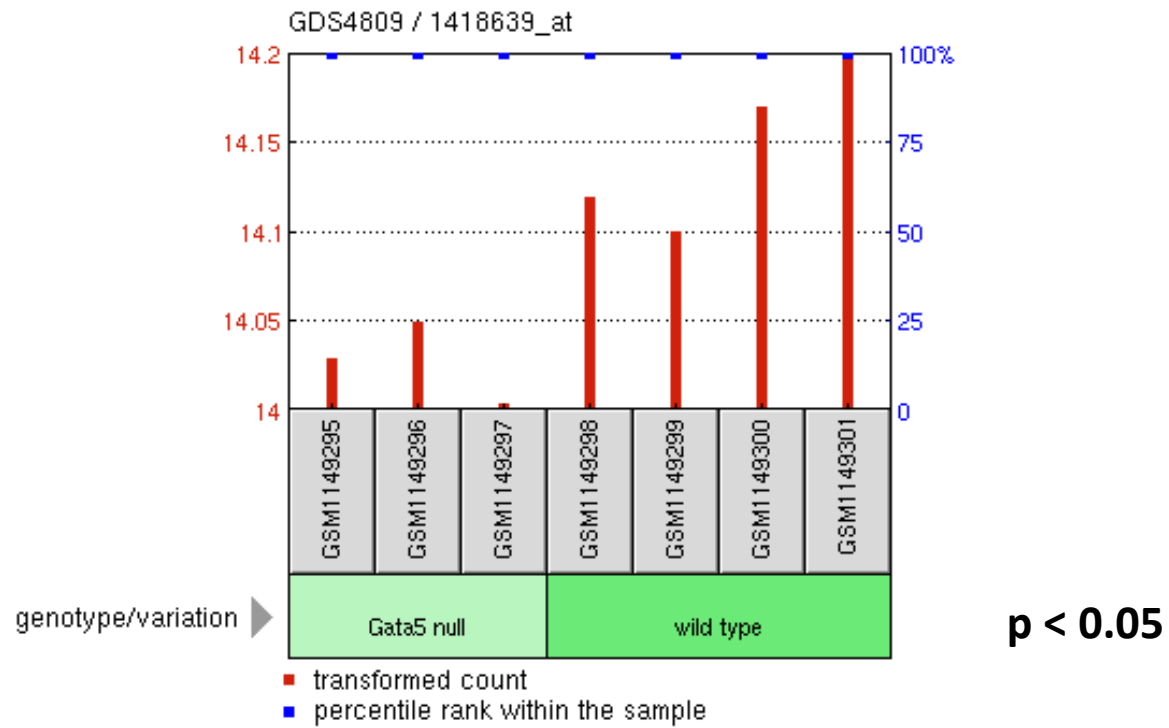
GDS4809 / 1418639_at

Title

Gata5 deficiency effect on the lung

Organism

Mus musculus



***GATA5*: a candidate activator of the *SFTPC* expression**

Sample	Title	Value
GSM1149295	KO618	14.03
GSM1149296	KO621	14.05
GSM1149297	KO624	14
GSM1149298	WT619	14.12
GSM1149299	WT623	14.1
GSM1149300	WT648	14.17
GSM1149301	WT659	14.2

Profile: GATA5 expression

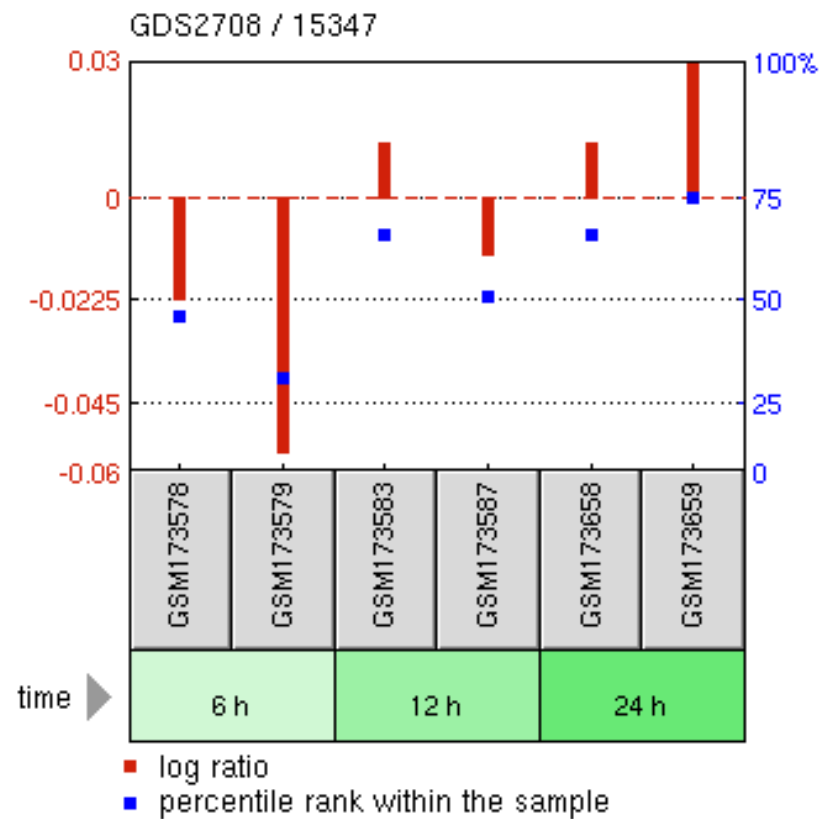
GDS2708 / 15347

Title

Quercetin effect on cultured cardiomyocytes: time course

Organism

Rattus norvegicus



Quercetin enhances the GATA5 expression

Sample	Title	Value
GSM173578	Quercetin treated cardiomyocytes for 6 hours (Q6-A).	-0.0227201
GSM173579	Quercetin treated cardiomyocytes for 6 hours (Q6-B).	-0.0564461
GSM173583	Quercetin treated cardiomyocytes for 12 hours (Q12-A).	0.0121804
GSM173587	Quercetin treated cardiomyocytes for 12 hours (Q12-B).	-0.0128478
GSM173658	Quercetin treated cardiomyocytes for 24 hours (Q24-A).	0.0121804
GSM173659	Quercetin treated cardiomyocytes for 24 hours (Q24-B).	0.0297642

Profile: *GATA5* expression

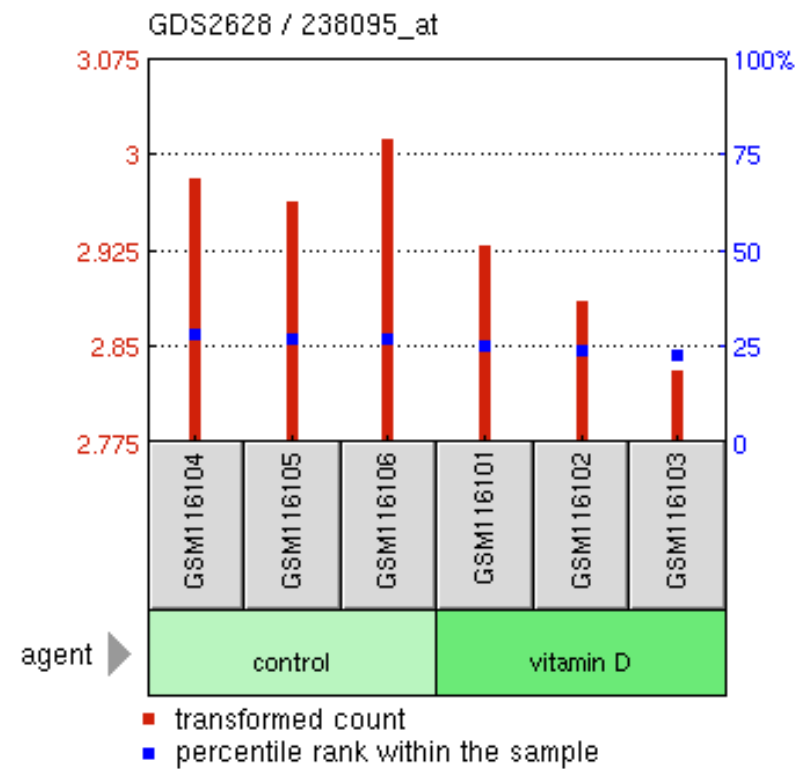
GDS2628 / 238095_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

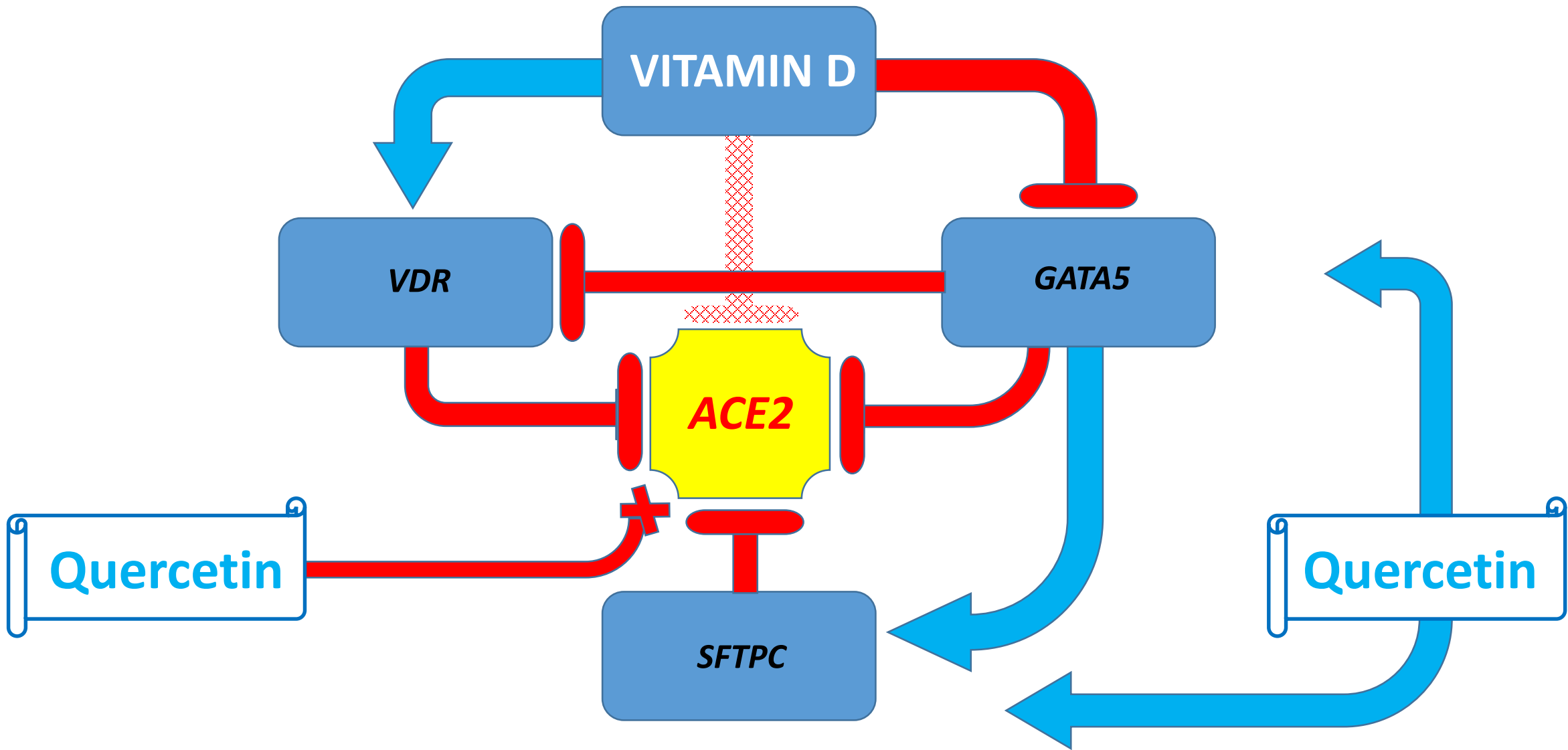
Homo sapiens

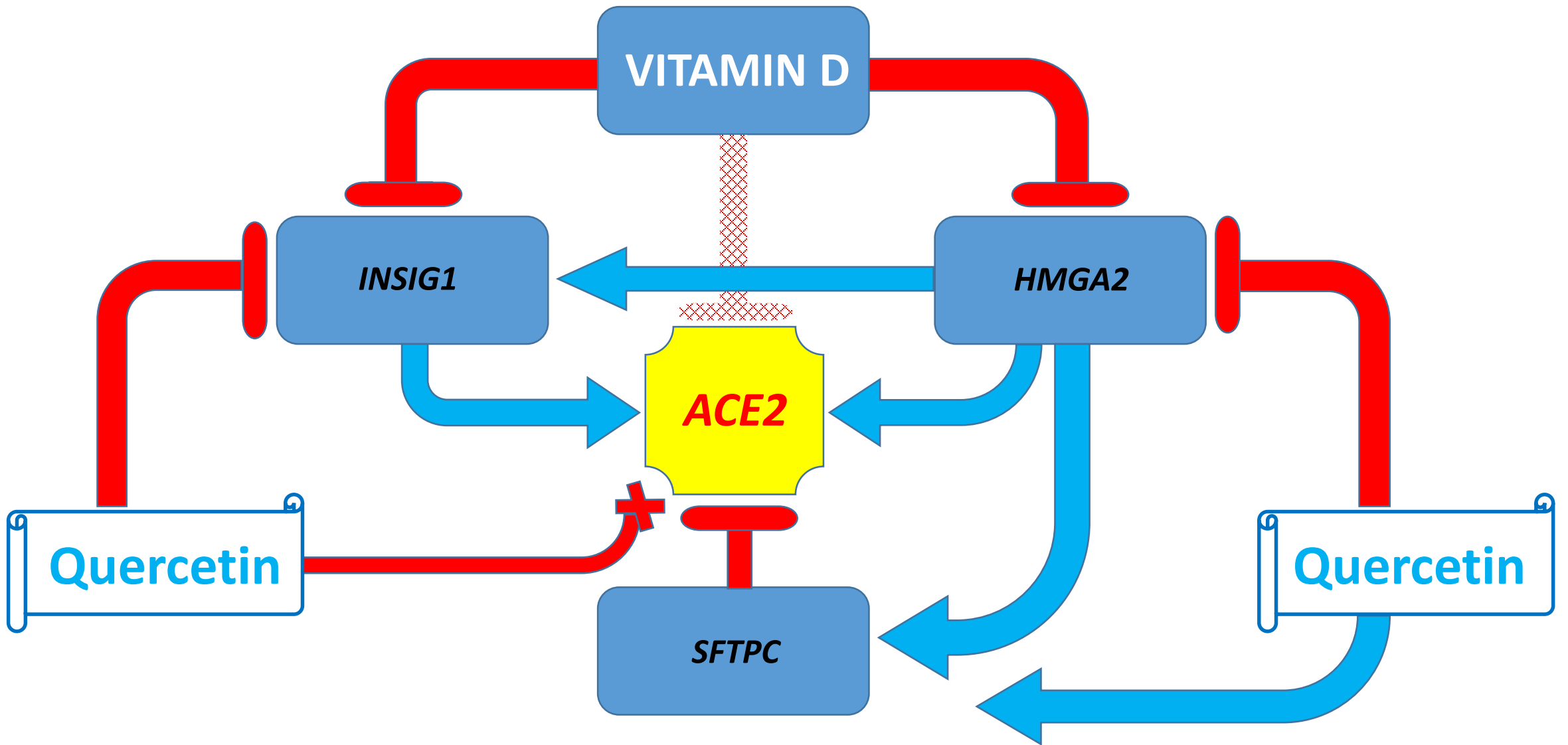


p < 0.05

Vitamin D inhibits the *GATA5* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	2.98202
GSM116105	hBSMC_control_rep2	2.96376
GSM116106	hBSMC_control_rep3	3.01345
GSM116101	hBSMC_vitamin D_rep1	2.92934
GSM116102	hBSMC_vitamin D_rep2	2.88574
GSM116103	hBSMC_vitamin D_rep3	2.83171





Profile: *SFTPC* expression

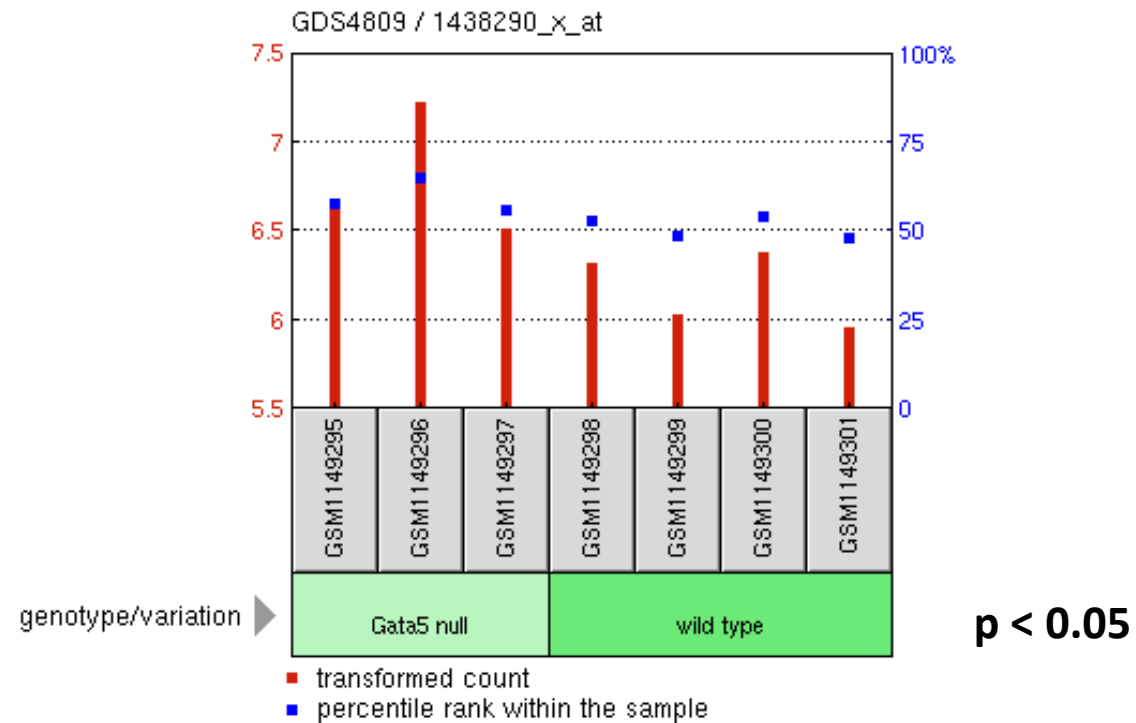
GDS4809 / 1438290_x_at

Title

Gata5 deficiency effect on the lung

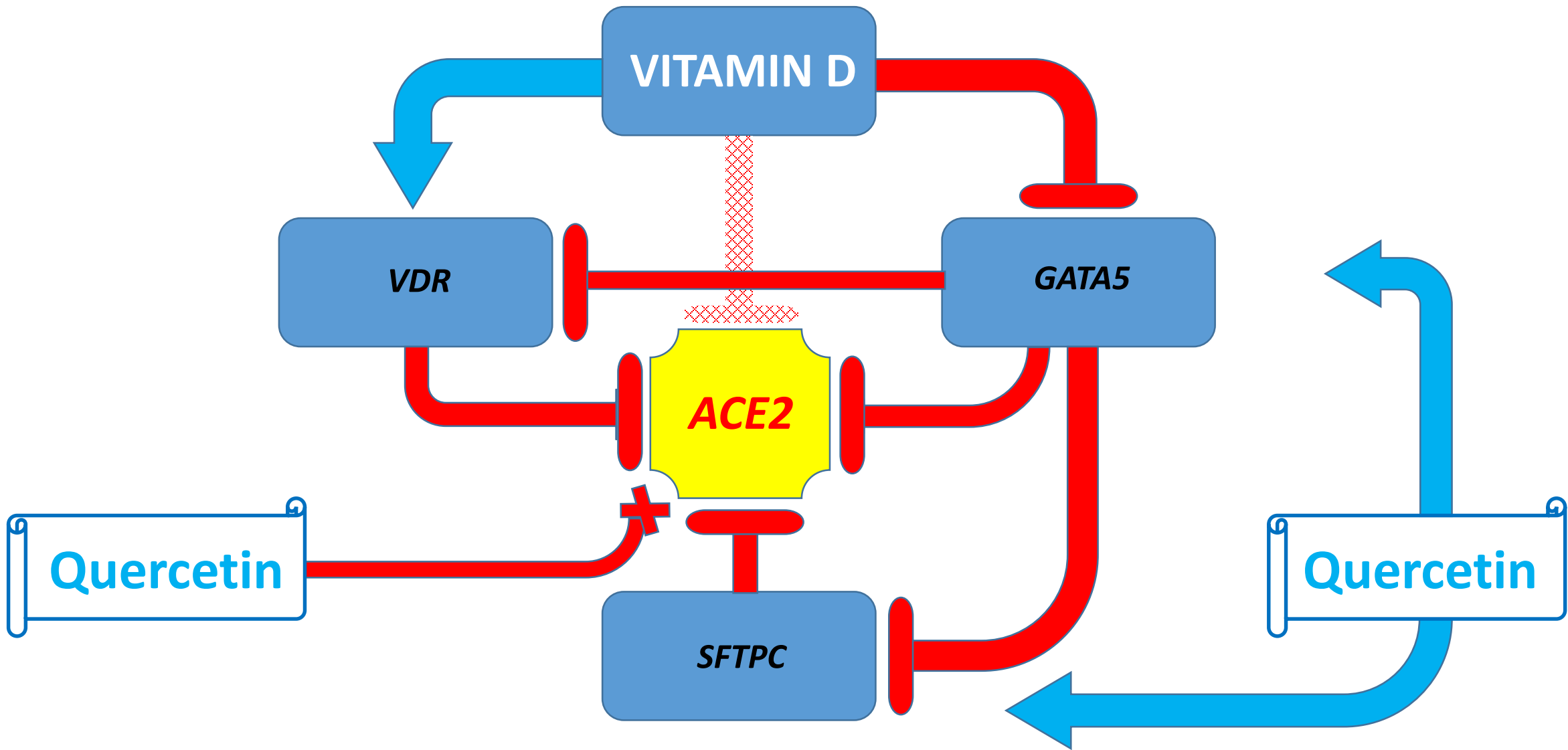
Organism

Mus musculus



GATA5: a candidate inhibitor of the *SFTPC* expression

Sample	Title	Value
GSM1149295	KO618	6.65
GSM1149296	KO621	7.23
GSM1149297	KO624	6.52
GSM1149298	WT619	6.32
GSM1149299	WT623	6.04
GSM1149300	WT648	6.39
GSM1149301	WT659	5.96



Examples of the potential negative effects of
drugs on the ACE2 expression

Profile *INSIG1* expression

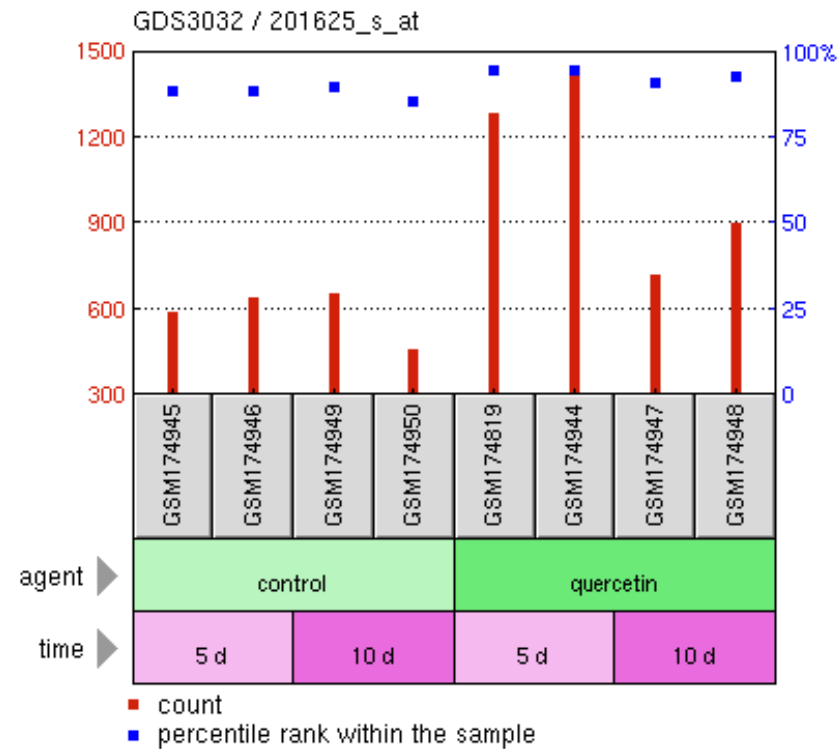
GDS3032 / 201625_s_at

Title

Quercetin effect on intestinal cell differentiation in vitro: time course

Organism

Homo sapiens



Quercetin enhances the *INSIG1* expression

Sample	Title	Value
GSM174945	Control day 05 sample 1	593.419
GSM174946	Control day 05 sample 2	640.636
GSM174949	Control day 10 sample 1	654.401
GSM174950	Control day 10 sample 2	465.967
GSM174819	Quercetin day 05 sample 1	1286.16
GSM174944	Quercetin day 05 sample 2	1420.46
GSM174947	Quercetin day 10 sample 1	722.644
GSM174948	Quercetin day 10 sample 2	905.527

Profile: *INSIG1* expression

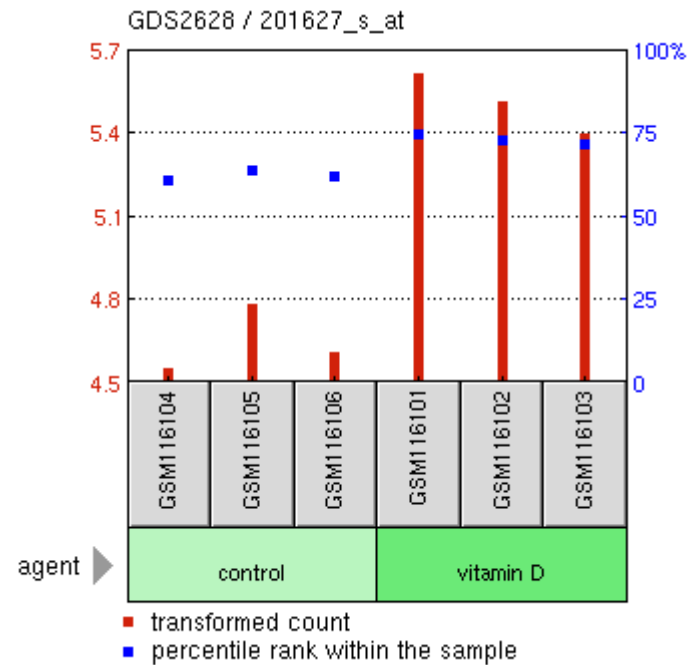
GDS2628 / 201627_s_at

Title

Vitamin D effect on bronchial smooth muscle cells

Organism

Homo sapiens



Vitamin D enhances the *INSIG1* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	4.5524
GSM116105	hBSMC_control_rep2	4.78368
GSM116106	hBSMC_control_rep3	4.6123
GSM116101	hBSMC_vitamin D_rep1	5.61848
GSM116102	hBSMC_vitamin D_rep2	5.51657
GSM116103	hBSMC_vitamin D_rep3	5.40349

Profile: *INSIG1* expression

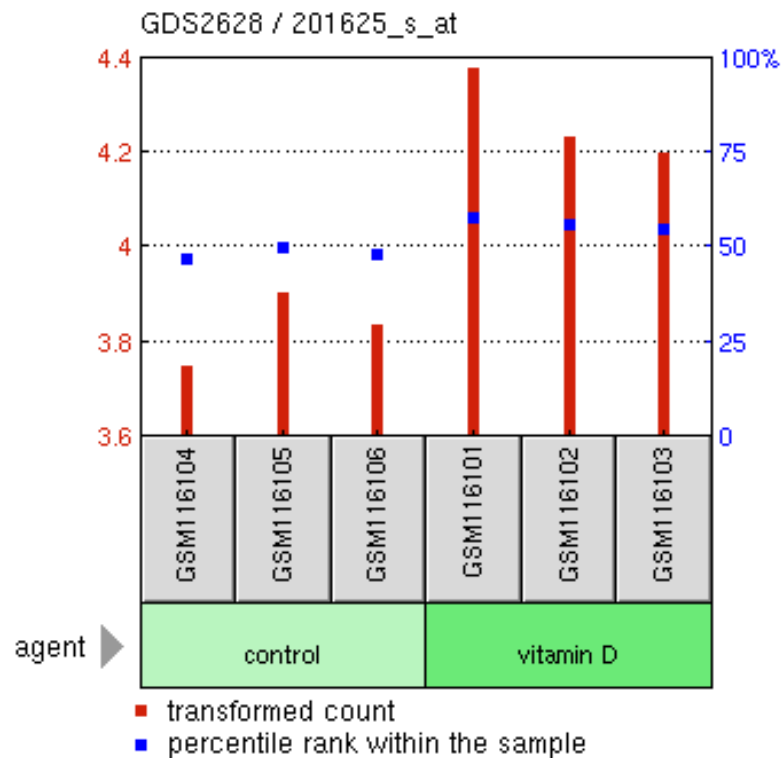
GDS2628 / 201625_s_at

Title

**Vitamin D effect on
bronchial smooth muscle
cells**

Organism

Homo sapiens



Vitamin D enhances the *INSIG1* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	3.75107
GSM116105	hBSMC_control_rep2	3.90763
GSM116106	hBSMC_control_rep3	3.83897
GSM116101	hBSMC_vitamin D_rep1	4.37812
GSM116102	hBSMC_vitamin D_rep2	4.2358
GSM116103	hBSMC_vitamin D_rep3	4.19935

Profile: *INSIG1* expression

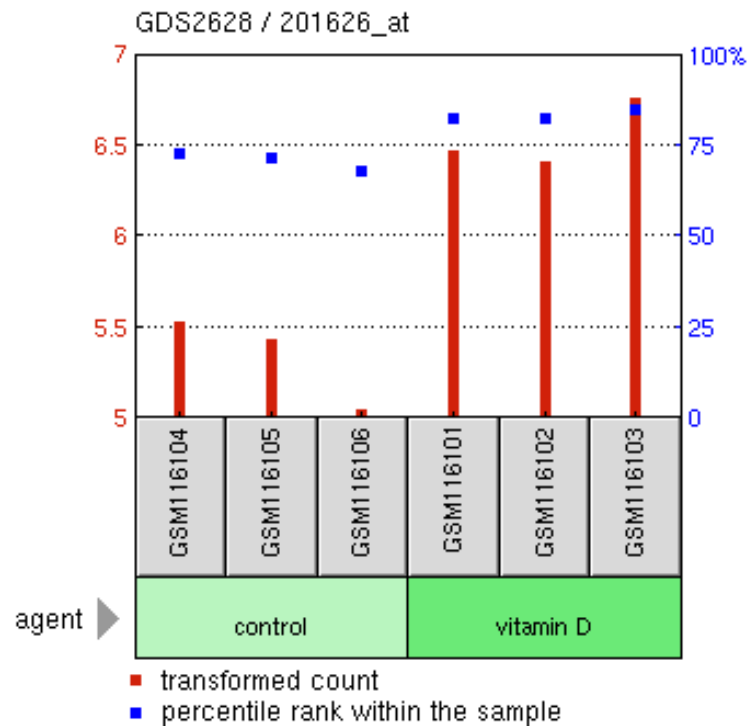
GDS2628 / 201626_at

Title

Vitamin D effect on
bronchial smooth muscle
cells

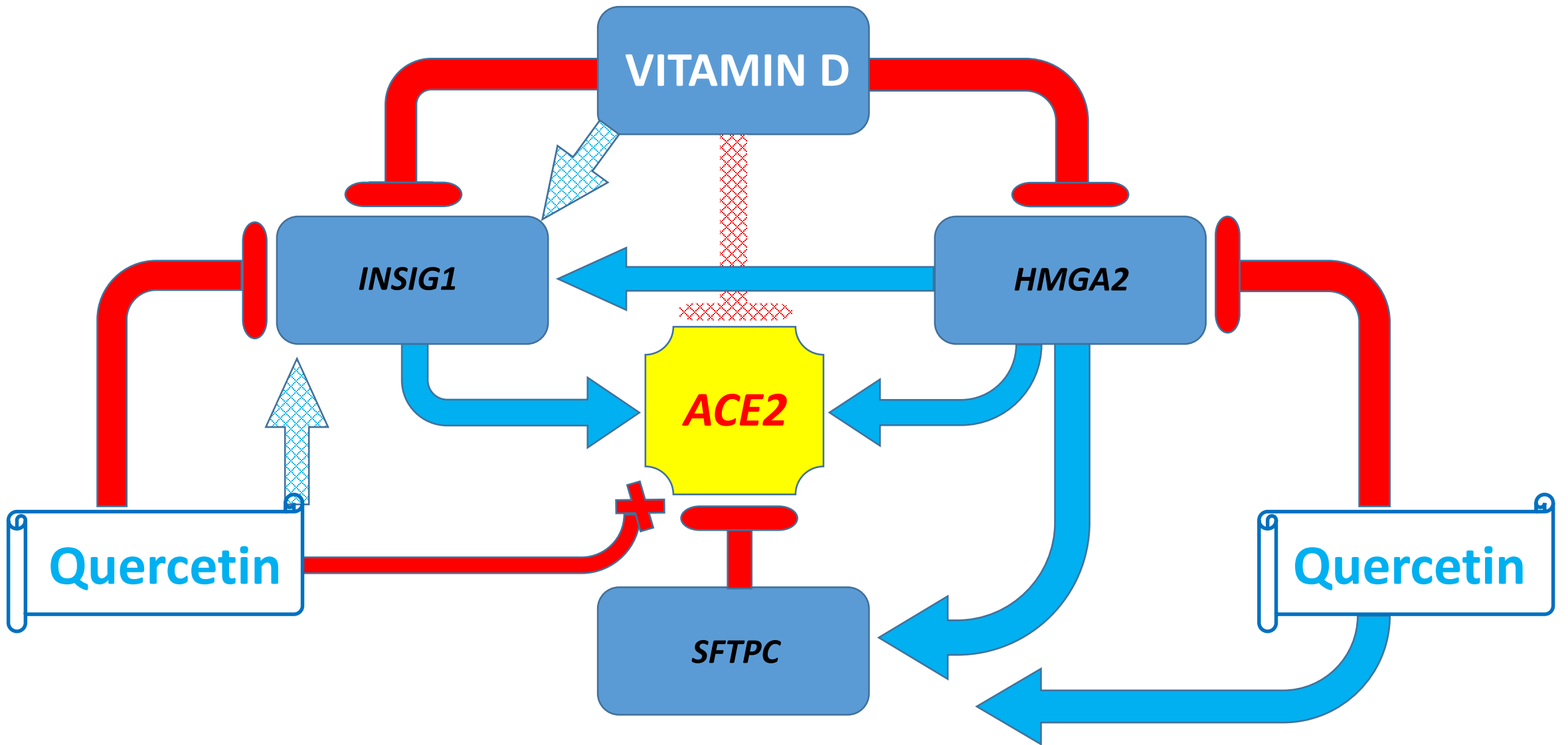
Organism

Homo sapiens



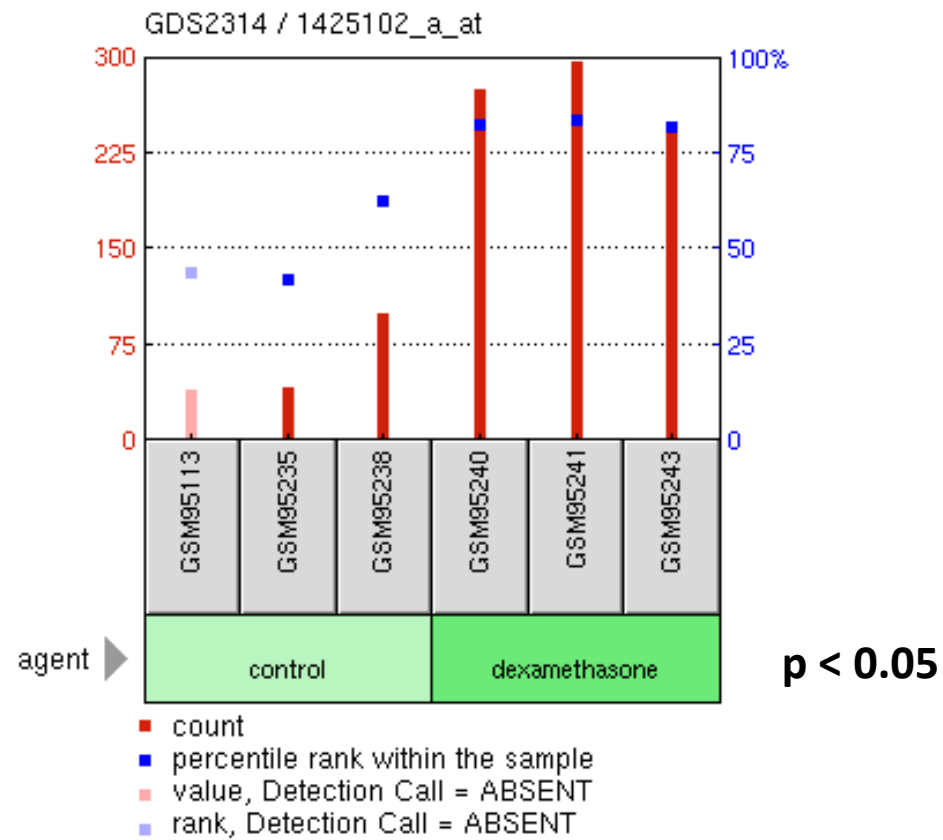
Vitamin D enhances the *INSIG1* expression

Sample	Title	Value
GSM116104	hBSMC_control_rep1	5.53893
GSM116105	hBSMC_control_rep2	5.43847
GSM116106	hBSMC_control_rep3	5.01659
GSM116101	hBSMC_vitamin D_rep1	6.47195
GSM116102	hBSMC_vitamin D_rep2	6.42131
GSM116103	hBSMC_vitamin D_rep3	6.76932



Profile: ACE2 expression
 GDS2314 / 1425102_a_at

Title
 Antenatal steroid effect on the placenta
 Organism
 Mus musculus



Dexamethasone enhances the ACE2 expression

Sample	Title	Value
GSM95113	Control 1	40.6
GSM95235	Control 2	42
GSM95238	Control 3	100.9
GSM95240	Dexamethasone 1	275.7
GSM95241	Dexamethasone 2	298
GSM95243	Dexamethasone 3	249.5

Profile: ACE2 expression

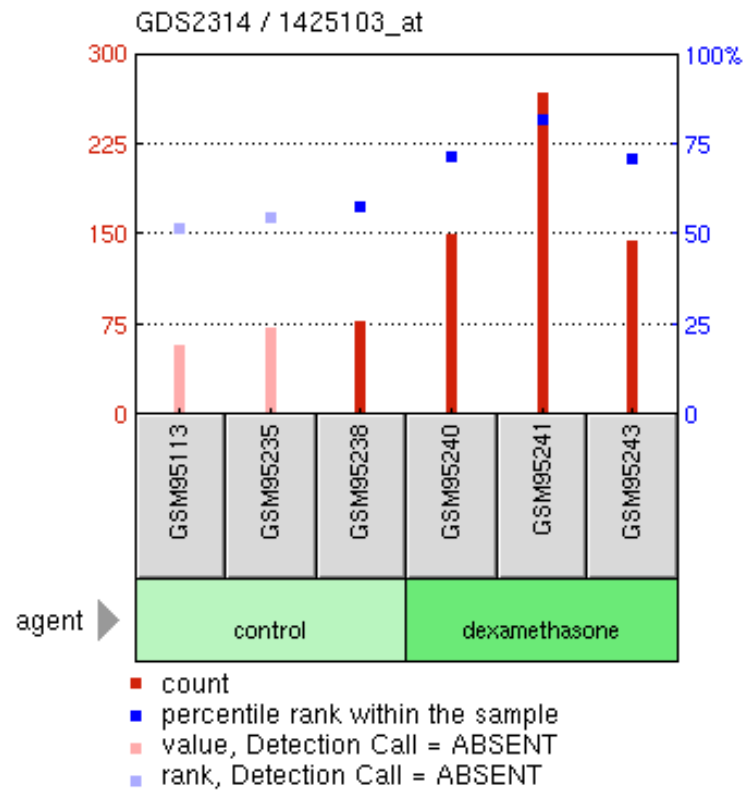
GDS2314 / 1425103_at

Title

Antenatal steroid effect on the placenta

Organism

Mus musculus



p < 0.05

Dexamethasone enhances the ACE2 expression

Sample	Title	Value
GSM95113	Control 1	58
GSM95235	Control 2	73.3
GSM95238	Control 3	79.1
GSM95240	Dexamethasone 1	151
GSM95241	Dexamethasone 2	268.3
GSM95243	Dexamethasone 3	145.8

Profile: ACE2 expression

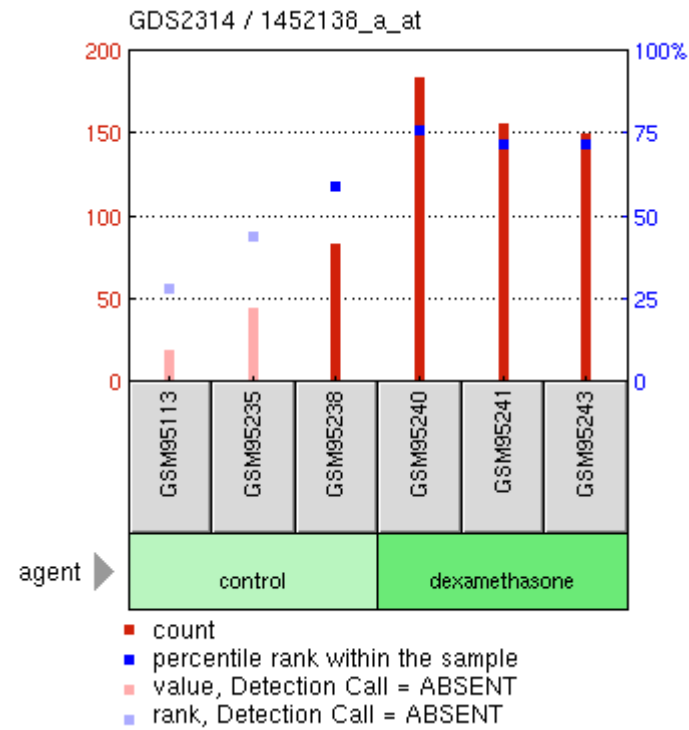
GDS2314 / 1452138_a_at

Title

Antenatal steroid effect on the placenta

Organism

Mus musculus



Dexamethasone enhances the ACE2 expression

Sample	Title	Value
GSM95113	Control 1	19.6
GSM95235	Control 2	45.5
GSM95238	Control 3	83.4
GSM95240	Dexamethasone 1	183.3
GSM95241	Dexamethasone 2	155.8
GSM95243	Dexamethasone 3	150

Supplemental Table S13. Additional examples of the potential activators and repressors of the *ACE2* expression identified using transgenic mouse models

Additional examples of the potential activators of
the *ACE2* expression identified using transgenic
mouse models

Profile: ACE2 expression

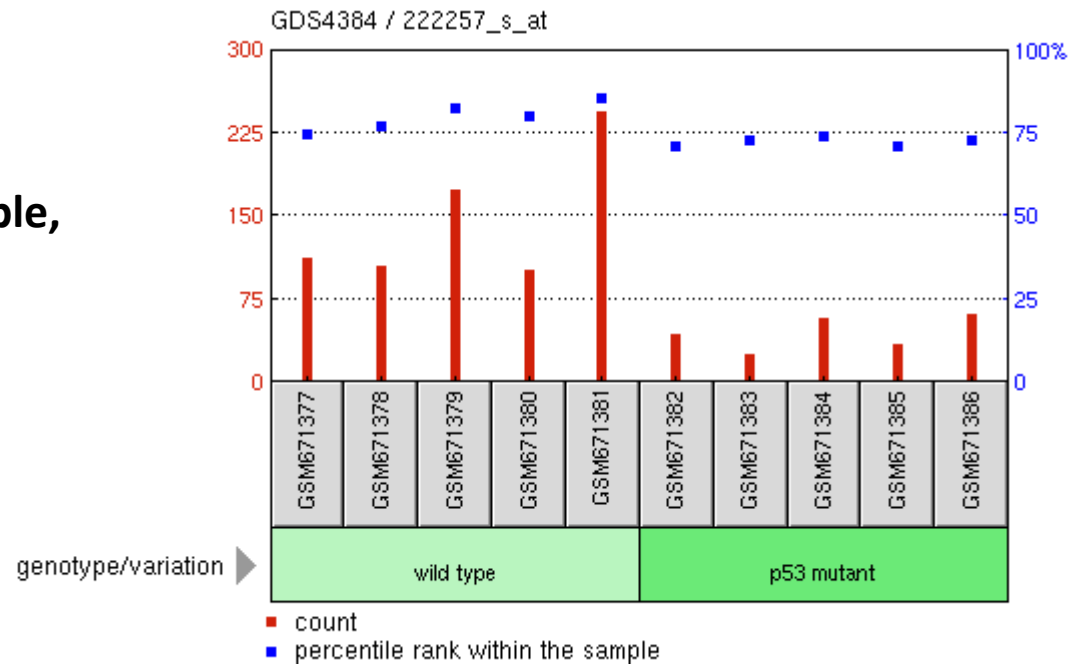
GDS4384 / 222257_s_at

Title

p53 mutations in microsatellite-stable,
stage III colorectal cancer

Organism

Homo sapiens



Sample	Title	Value
GSM671377	UM13_Wt_rep1	112.441
GSM671378	UM23_Wt_rep2	105.683
GSM671379	UM30_Wt_rep3	173.535
GSM671380	UM9_Wt_rep4	101.705
GSM671381	UM3_Wt_rep5	244.407
GSM671382	UM1_Mut_rep1	44.3901
GSM671383	UM15_Mtu_rep2	26.5371
GSM671384	UM17_Mtu_rep3	59.3536
GSM671385	UM2_Mtu_rep4	34.4729
GSM671386	UM25_Mtu_rep5	62.1878

Profile: ACE2 expression

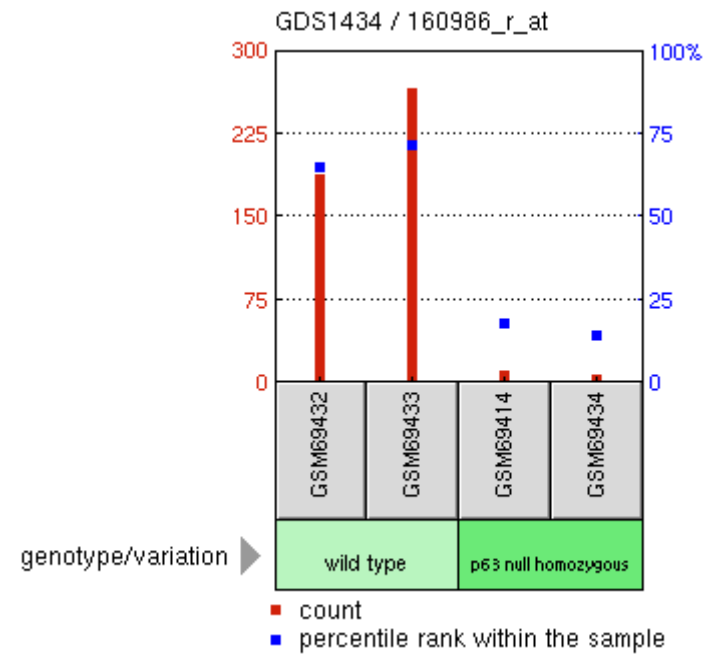
GDS1434 / 160986_r_at

Title

Transcription factor p63 null mutation
effect on skin (MG-U74A)

Organism

Mus musculus



Sample	Title	Value
GSM69432	E18.5 p63 wt skin 1 A-chip	189.3
GSM69433	E18.5 p63 wt skin 2 A-chip	267.1
GSM69414	E18.5 p63 null skin 1 A-chip	11.5
GSM69434	E18.5 p63 null skin 2 A-chip	8.4

Profile: ACE2 expression

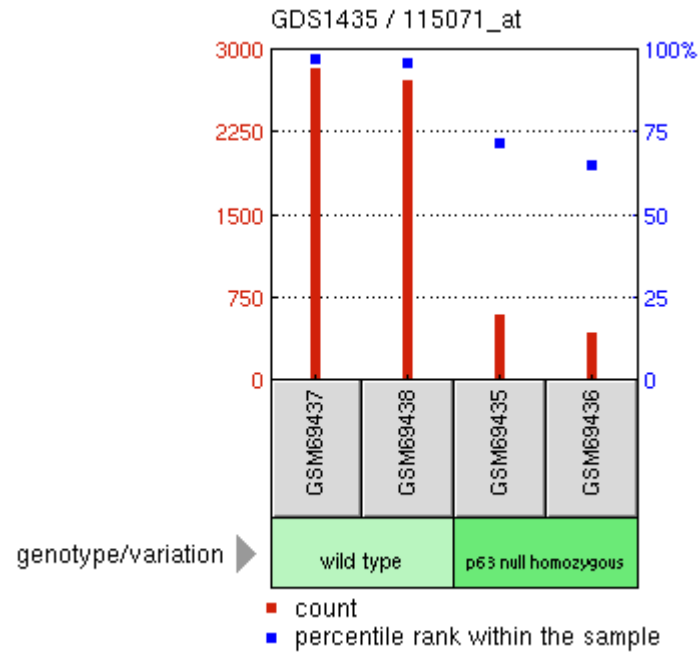
GDS1435 / 115071_at

Title

Transcription factor p63 null
mutation effect on skin (MG-
U74B)

Organism

Mus musculus



Sample	Title	Value
GSM69437	E18.5 wt skin 1 B-chip	2821.9
GSM69438	E18.5 wt skin 2 B-chip	2718.1
GSM69435	E18.5 p63 null skin 1 B-chip	602.2
GSM69436	E18.5 p63 null skin 2 B-chip	449.1

Profile: ACE2 expression

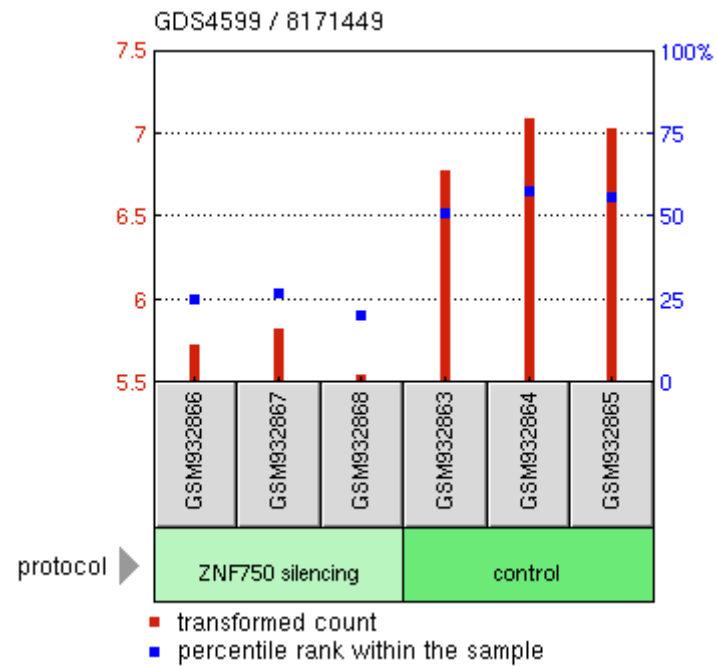
GDS4599 / 8171449

Title

ZNF750 silencing effect on
differentiated keratinocytes

Organism

Homo sapiens



Sample	Title	Value
GSM932866	HaCaT_ZNF750i_ biological rep1	5.74045
GSM932867	HaCaT_ZNF750i_ biological rep2	5.82679
GSM932868	HaCaT_ZNF750i_ biological rep3	5.52392
GSM932863	HaCaT_Control_ biological rep1	6.78372
GSM932864	HaCaT_Control_ biological rep2	7.09307
GSM932865	HaCaT_Control_ biological rep3	7.03868

Profile: ACE2 expression

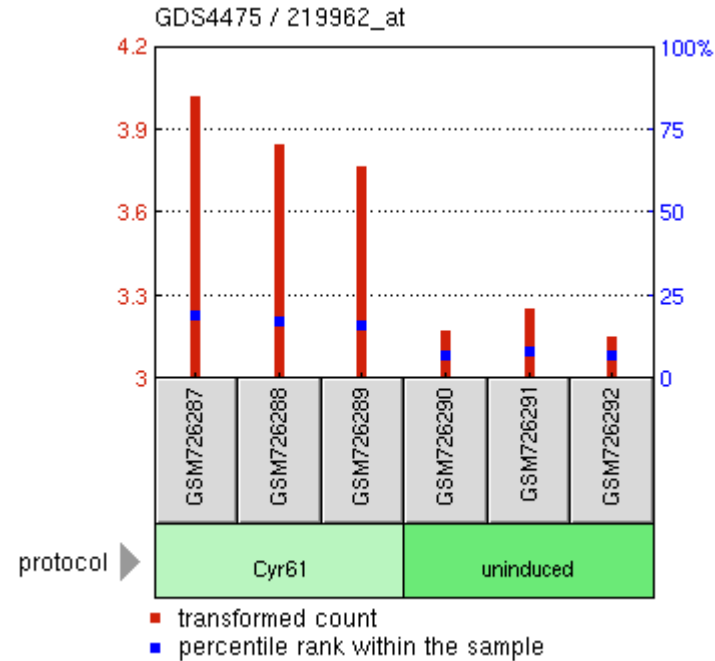
GDS4475 / 219962_at

Title

Extracellular matrix protein cysteine rich 61 (CCN1) effect on LN229 glioma cells

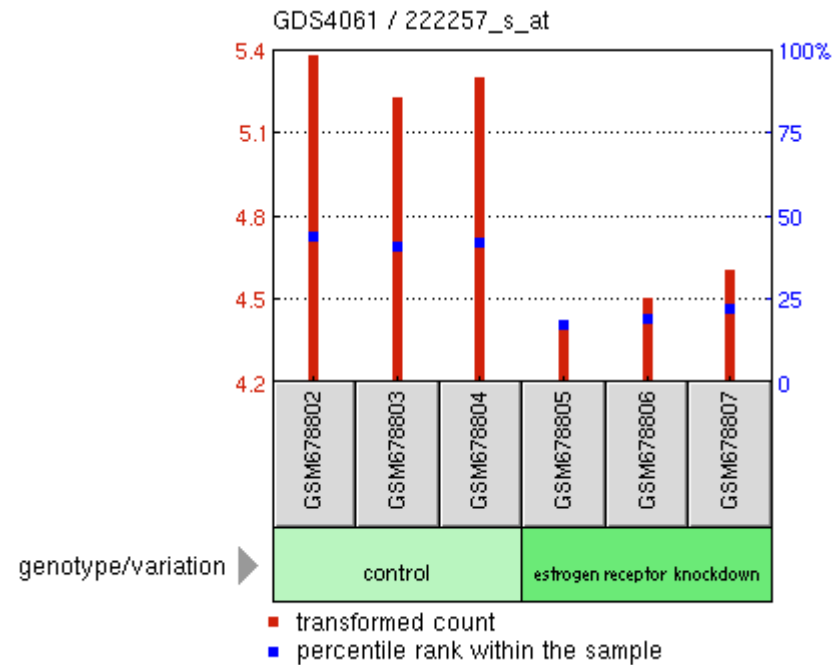
Organism

Homo sapiens



Sample	Title	Value
GSM726287	Tetracycline-inducible glioma cells dox 1	4.02176
GSM726288	Tetracycline-inducible glioma cells dox 2	3.85144
GSM726289	Tetracycline-inducible glioma cells dox 3	3.77096
GSM726290	Tetracycline-inducible glioma cells no dox 1	3.17831
GSM726291	Tetracycline-inducible glioma cells no dox 2	3.25989
GSM726292	Tetracycline-inducible glioma cells no dox 3	3.15658

Profile: ACE2 expression
GDS4061 / 222257_s_at
Title
Estrogen receptor alpha-silenced
MCF7 breast cancer cells
Organism
Homo sapiens



Sample	Title	Value
GSM678802	MCF7, biological rep1	5.37948
GSM678803	MCF7, biological rep2	5.23028
GSM678804	MCF7, biological rep3	5.30543
GSM678805	MCF7 silenced Estrogen receptor, biological rep1	4.40684
GSM678806	MCF7 silenced Estrogen receptor, biological rep2	4.50939
GSM678807	MCF7 silenced Estrogen receptor, biological rep3	4.609

Profile: ACE2 expression

GDS4061 / 219962_at

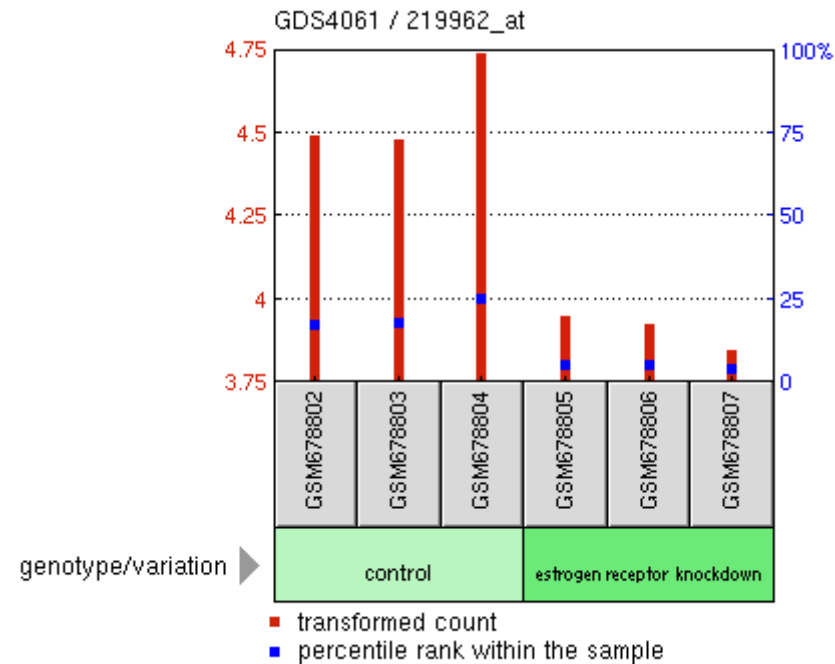
Title

Estrogen receptor alpha-silenced

MCF7 breast cancer cells

Organism

Homo sapiens



Sample	Title	Value
GSM678802	MCF7, biological rep1	4.49106
GSM678803	MCF7, biological rep2	4.48349
GSM678804	MCF7, biological rep3	4.73862
GSM678805	MCF7 silenced Estrogen receptor, biological rep1	3.94941
GSM678806	MCF7 silenced Estrogen receptor, biological rep2	3.9283
GSM678807	MCF7 silenced Estrogen receptor, biological rep3	3.84918

Profile: ACE2 expression

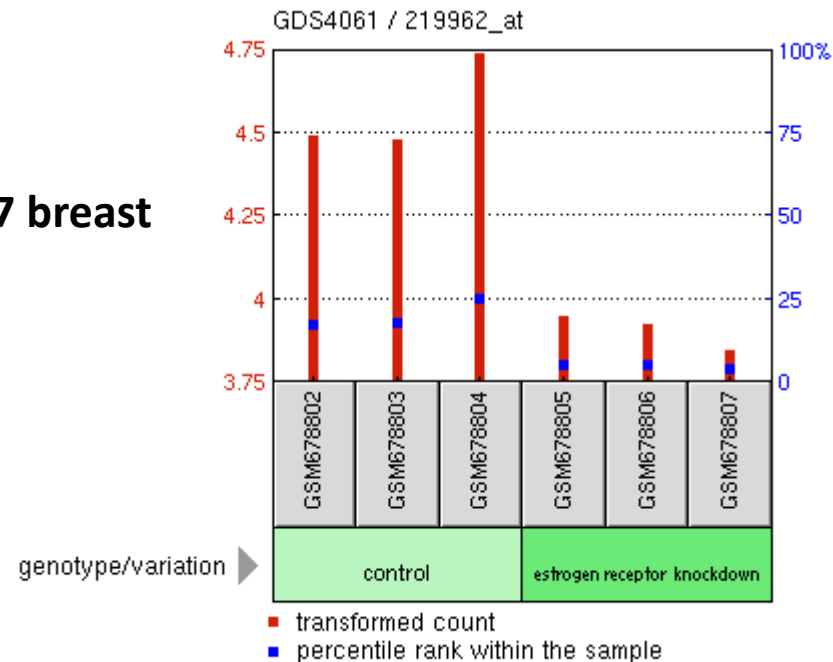
GDS4061 / 219962_at

Title

Estrogen receptor alpha-silenced MCF7 breast cancer cells

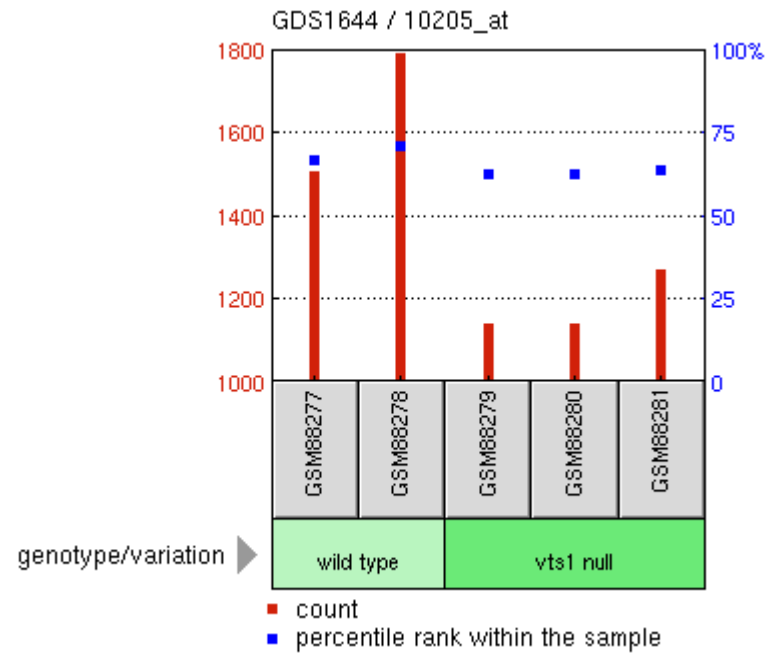
Organism

Homo sapiens



Sample	Title	Value
GSM678802	MCF7, biological rep1	4.49106
GSM678803	MCF7, biological rep2	4.48349
GSM678804	MCF7, biological rep3	4.73862
GSM678805	MCF7 silenced Estrogen receptor, biological rep1	3.94941
GSM678806	MCF7 silenced Estrogen receptor, biological rep2	3.9283
GSM678807	MCF7 silenced Estrogen receptor, biological rep3	3.84918

Profile: ACE2 expression
GDS1644 / 10205_at
Title
VTS1 deletion mutant
Organism
Saccharomyces cerevisiae



Sample	Title	Value
GSM88277	WT1	1506.8
GSM88278	WT2	1791
GSM88279	Exp Pt 1(dvts1-1 VTS1)	1141.9
GSM88280	Exp Pt 2(dvts1-2 VTS1)	1143.6
GSM88281	Exp Pt 3(VTS1)	1271.5

Profile: ACE2 expression

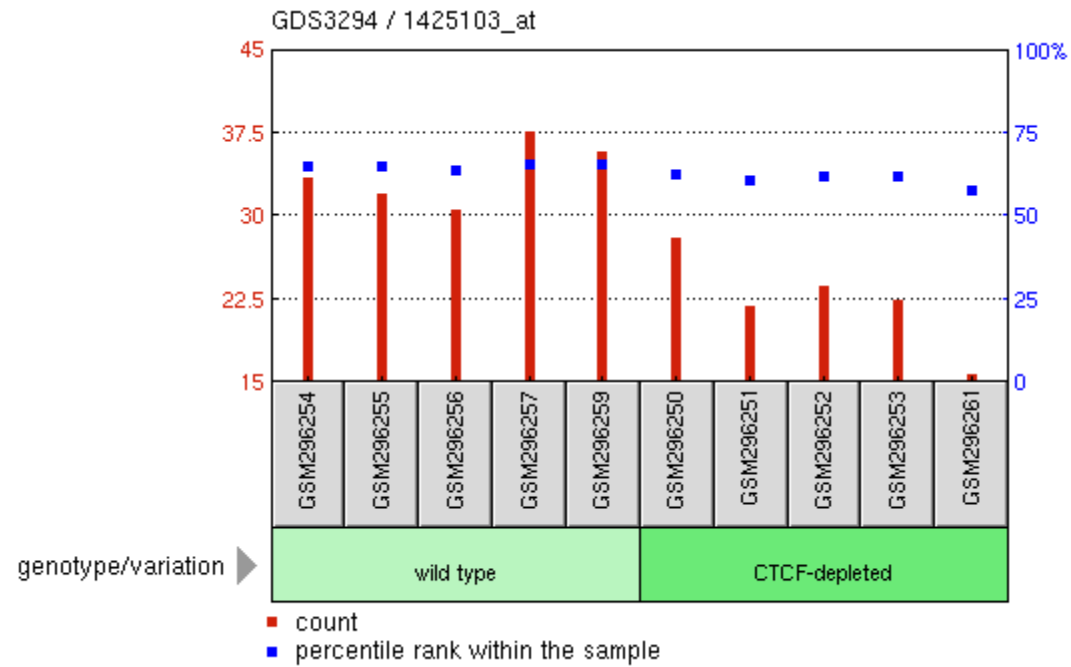
GDS3294 / 1425103_at

Title

CTCF depletion effect in oocytes

Organism

Mus musculus



Sample	Title	Value
GSM296254	gene expression of wild type oocyte, replicate 1	33.5935
GSM296255	gene expression of wild type oocyte, replicate 2	32.1628
GSM296256	gene expression of wild type oocyte, replicate 3	30.5551
GSM296257	gene expression of wild type oocyte, replicate 4	37.7155
GSM296259	gene expression of wild type oocyte, replicate 5	35.8225
GSM296250	gene expression of CTCF-depleted oocyte, replicate 1	28.1471
GSM296251	gene expression of CTCF-depleted oocyte, replicate 3	21.9578
GSM296252	gene expression of CTCF-depleted oocyte, replicate 4	23.7345
GSM296253	gene expression of CTCF-depleted oocyte, replicate 5	22.4628
GSM296261	gene expression of CTCF-depleted oocyte, replicate 2	15.8604

Profile: ACE2 expression

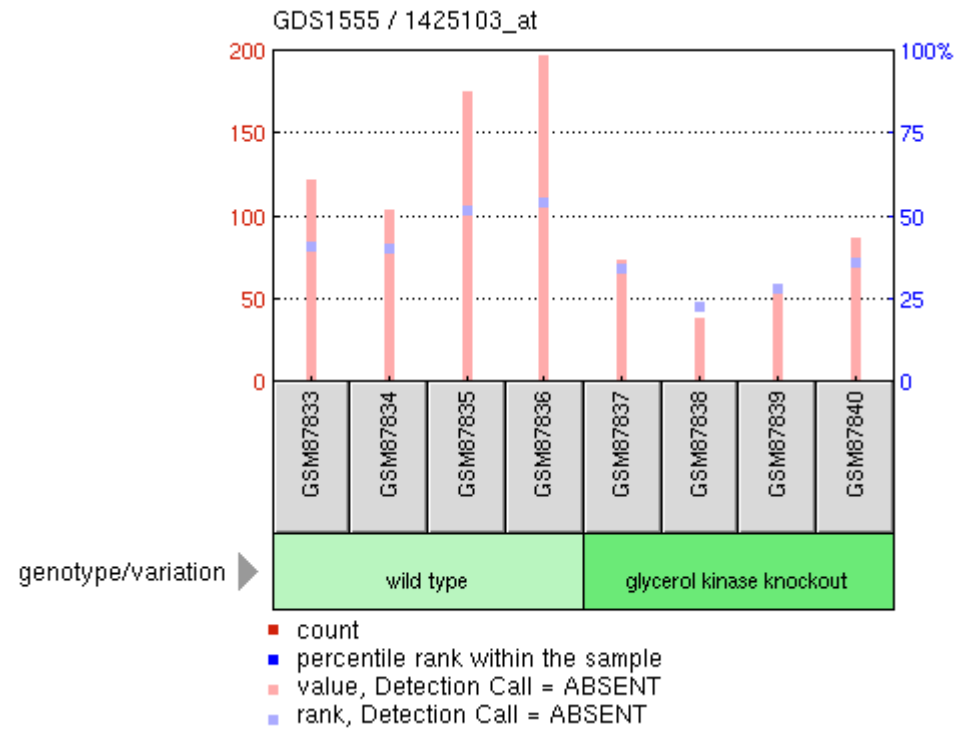
GDS1555 / 1425103_at

Title

Glycerol kinase knockout effect on liver

Organism

Mus musculus



Sample	Title	Value
GSM87833	Liver_WildType_1	122.1
GSM87834	Liver_WildType_2	104.3
GSM87835	Liver_WildType_3	174.9
GSM87836	Liver_WildType_4	197.4
GSM87837	Liver_KnockOut_1	74
GSM87838	Liver_KnockOut_2	39.3
GSM87839	Liver_KnockOut_3	59.1
GSM87840	Liver_KnockOut_4	87.3

Profile: ACE2 expression

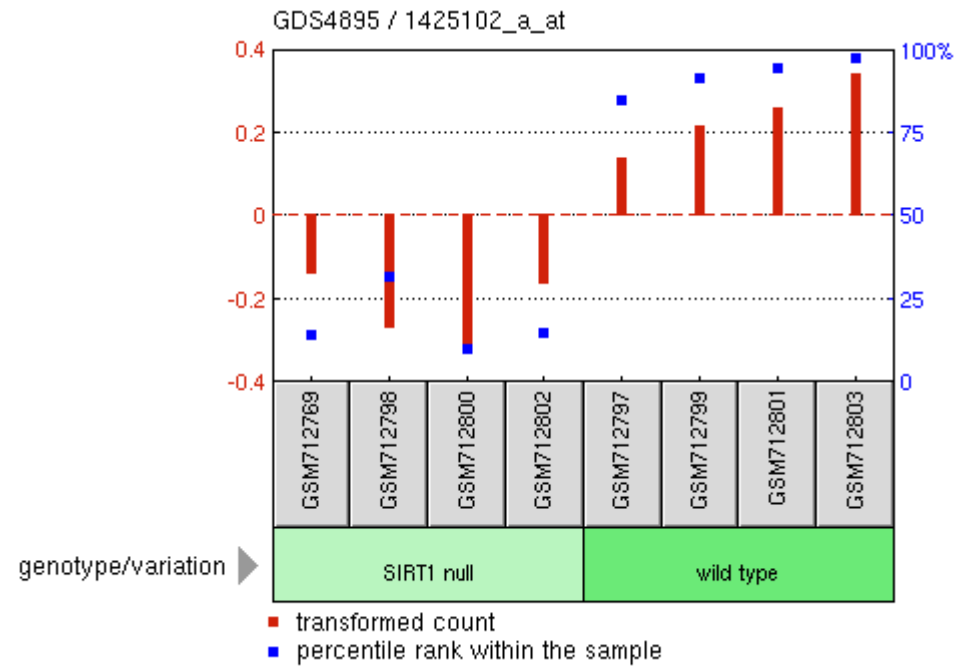
GDS4895 / 1425102_a_at

Title

SIRT1 deficiency effect on the brain

Organism

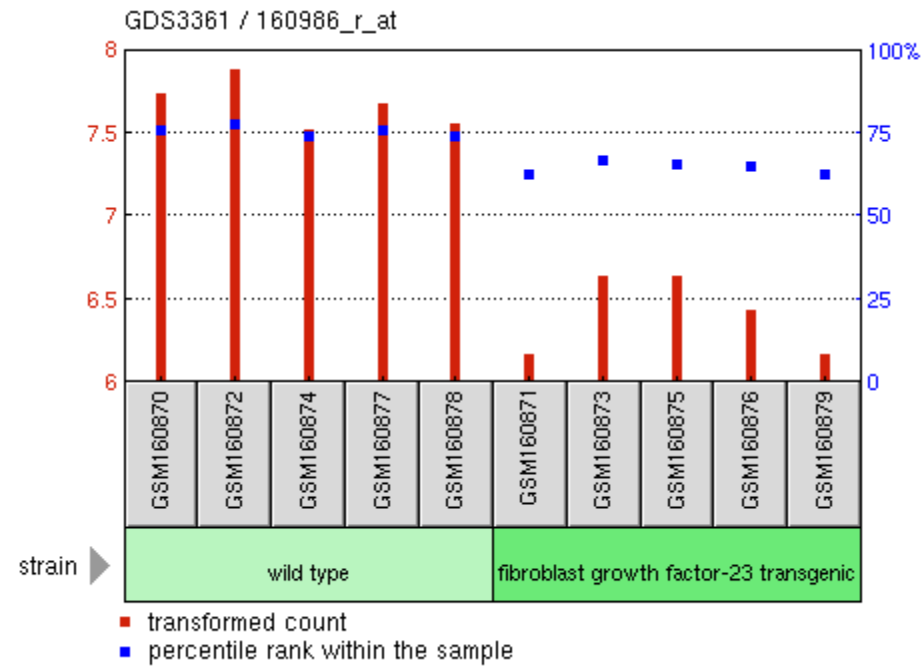
Mus musculus



Sample	Title	Value
GSM712769	BSKO 1	-0.140546
GSM712798	BSKO 2	-0.27286
GSM712800	BSKO 3	-0.312008
GSM712802	BSKO 4	-0.167778
GSM712797	WT 1	0.140546
GSM712799	WT 2	0.221
GSM712801	WT 3	0.261022
GSM712803	WT 4	0.344256

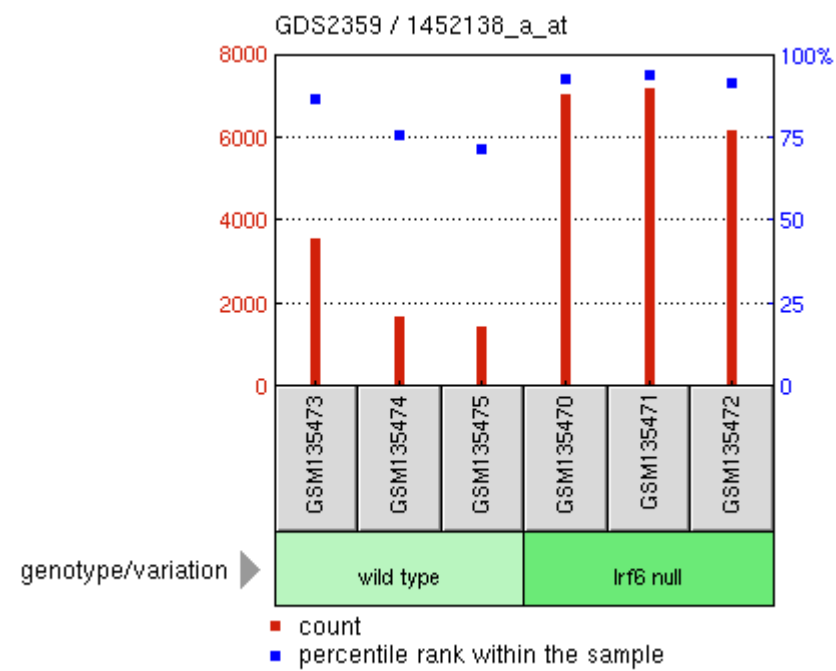
Additional examples of the potential repressors of
the *ACE2* expression identified using transgenic
mouse models

Profile: ACE2 expression
 GDS3361 / 160986_r_at
 Title
 Fibroblast growth factor-23
 transgenic model
 Organism
 Mus musculus



Sample	Title	Value
GSM160870	Wild Type 612	7.73651
GSM160872	Wild type 618	7.89066
GSM160874	Wild Type 650	7.5183
GSM160877	Wild Type nr 658	7.67757
GSM160878	Wild Type nr 663	7.55491
GSM160871	Transgenic nr 614	6.17722
GSM160873	Transgenic nr 619	6.64023
GSM160875	Transgenic nr 652	6.64915
GSM160876	Transgenic nr 657	6.44524
GSM160879	Transgenic nr 661	6.17914

Profile: ACE2 expression
GDS2359 / 1452138_a_at
Title
Interferon regulatory factor 6 null
mutation effect on the skin
Organism
Mus musculus



Sample	Title	Value
GSM135473	IRF6 wt, biological rep1	3607.2
GSM135474	IRF6 wt, biological rep2	1727.4
GSM135475	IRF6 wt, biological rep3	1461.4
GSM135470	IRF6 knockout, biological rep1	7077
GSM135471	IRF6 knockout, biological rep2	7212.6
GSM135472	IRF6 knockout, biological rep3	6184.5

Profile: ACE2 expression

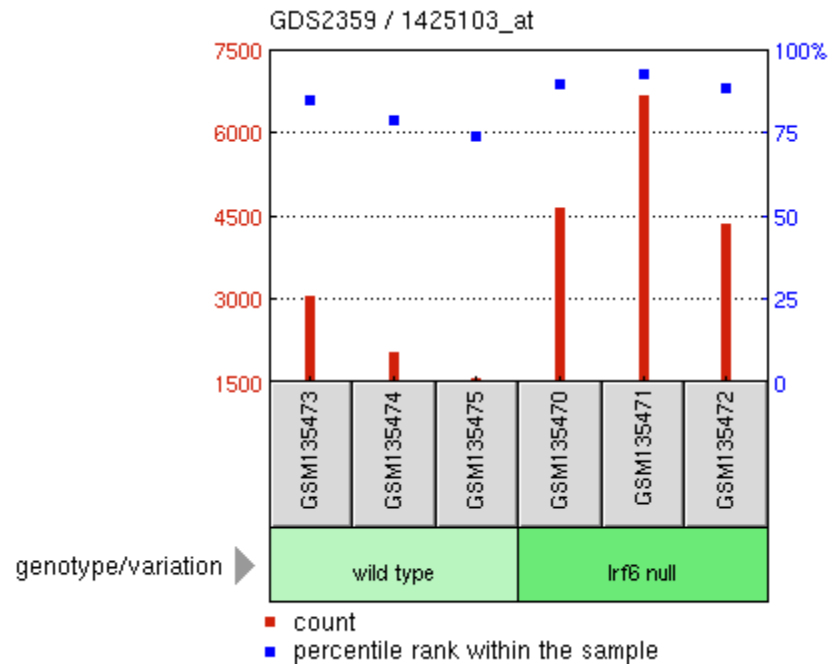
GDS2359 / 1425103_at

Title

Interferon regulatory factor 6 null
mutation effect on the skin

Organism

Mus musculus



Sample	Title	Value
GSM135473	IRF6 wt, biological rep1	3067.9
GSM135474	IRF6 wt, biological rep2	2065.9
GSM135475	IRF6 wt, biological rep3	1589.4
GSM135470	IRF6 knockout, biological rep1	4678.8
GSM135471	IRF6 knockout, biological rep2	6695.8
GSM135472	IRF6 knockout, biological rep3	4381.7

Profile: ACE2 expression
 GDS4498 / 1425102_a_at

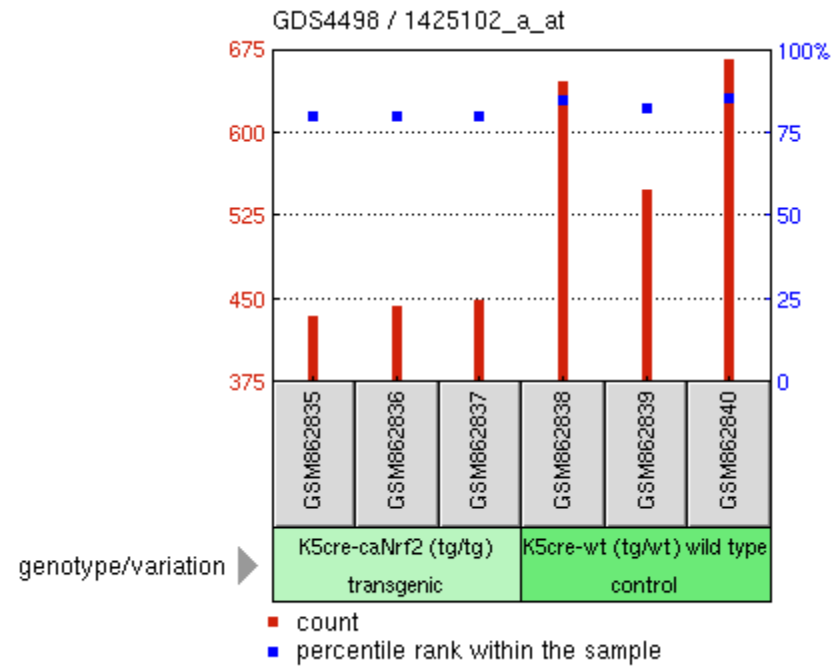
Title

Transcription factor Nrf2 gain-of-
 function model: postnatal day 2.5

whole skin

Organism

Mus musculus



Sample	Title	Value
GSM862835	transgene strong 1	435.03
GSM862836	transgene strong 2	444.737
GSM862837	transgene strong 3	449.601
GSM862838	wildtype strong 1	647.134
GSM862839	wildtype strong 2	548.634
GSM862840	wildtype strong 3	667.753

Profile: ACE2 expression

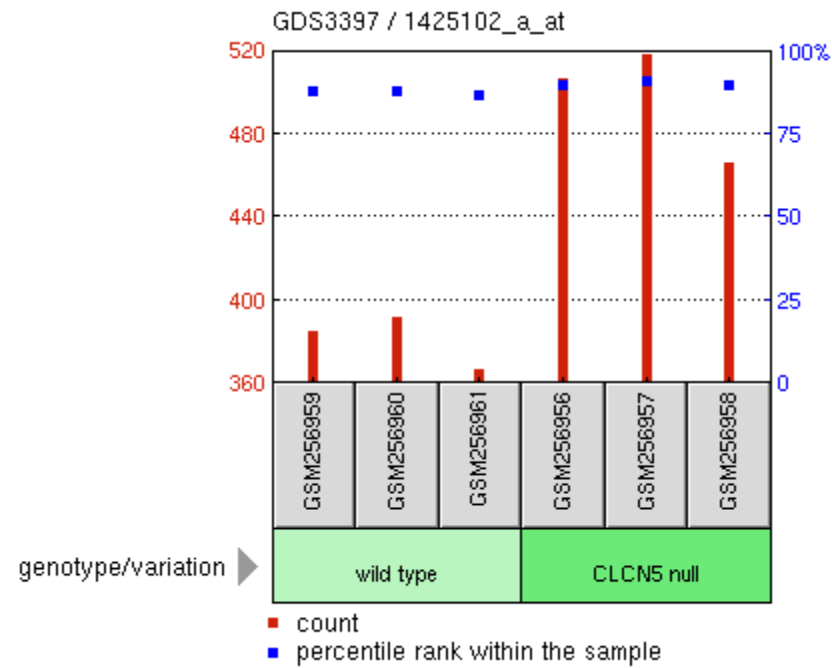
GDS3397 / 1425102_a_at

Title

Dent disease model: renal proximal tubules

Organism

Mus musculus



Sample	Title	Value
GSM256959	Wild type rep 1	385.878
GSM256960	Wild type rep 2	392.178
GSM256961	Wild type rep 3	367.379
GSM256956	CLC5 ko rep 1	507.455
GSM256957	CLC5 ko rep 2	518.388
GSM256958	CLC5 ko rep 3	466.324

Profile: ACE2 expression

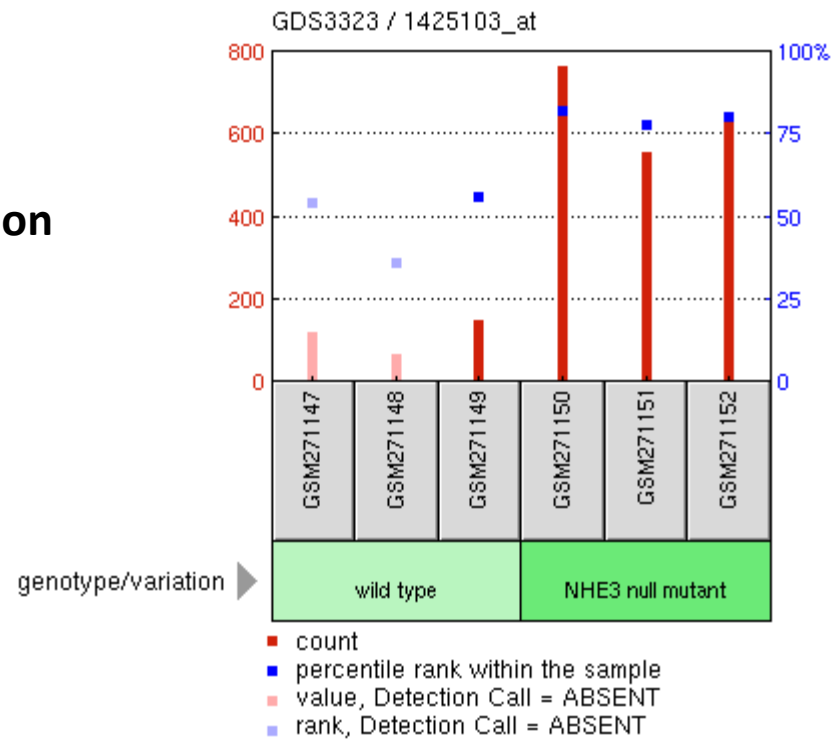
GDS3323 / 1425103_at

Title

Na⁺/H⁺ exchanger 3 deficiency effect on the colon

Organism

Mus musculus



Sample	Title	Value
GSM271147	NHE3+/+ replicate 1	122.3
GSM271148	NHE3+/+ replicate 2	68.2
GSM271149	NHE3+/+ replicate 3	150.2
GSM271150	NHE3-/- replicate 1	762.3
GSM271151	NHE3-/- replicate 2	554.9
GSM271152	NHE3-/- replicate 3	634.3

Profile: ACE2 expression

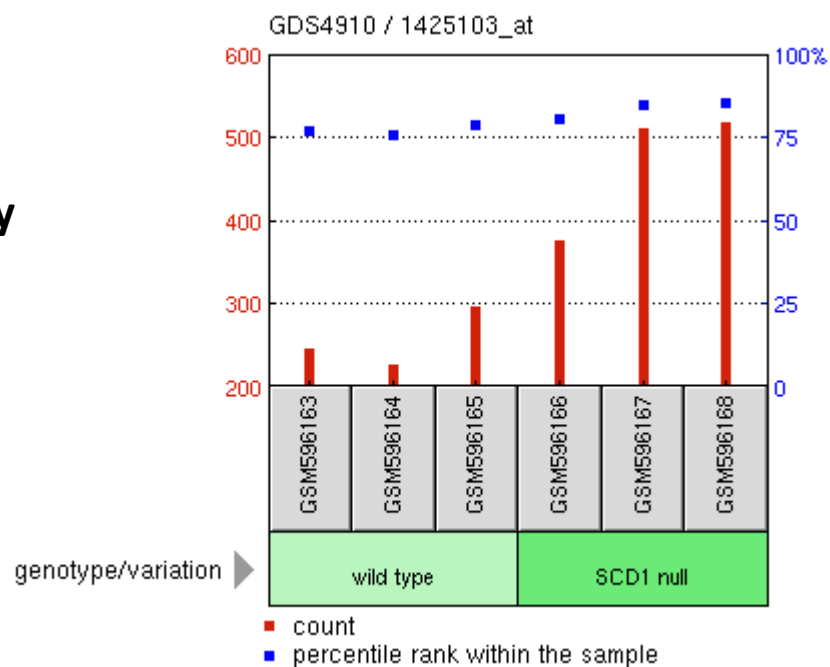
GDS4910 / 1425103_at

Title

Stearoyl-CoA desaturase-1 deficiency
effect on the skin

Organism

Mus musculus



Sample	Title	Value
GSM596163	Skin_Lox_Control_Rep1	246.595
GSM596164	Skin_Lox_Control_Rep2	227.702
GSM596165	Skin_Lox_Control_Rep3	297.552
GSM596166	Skin_SKO_Rep1	377.151
GSM596167	Skin_SKO_Rep2	512
GSM596168	Skin_SKO_Rep3	519.147

Profile: ACE2 expression

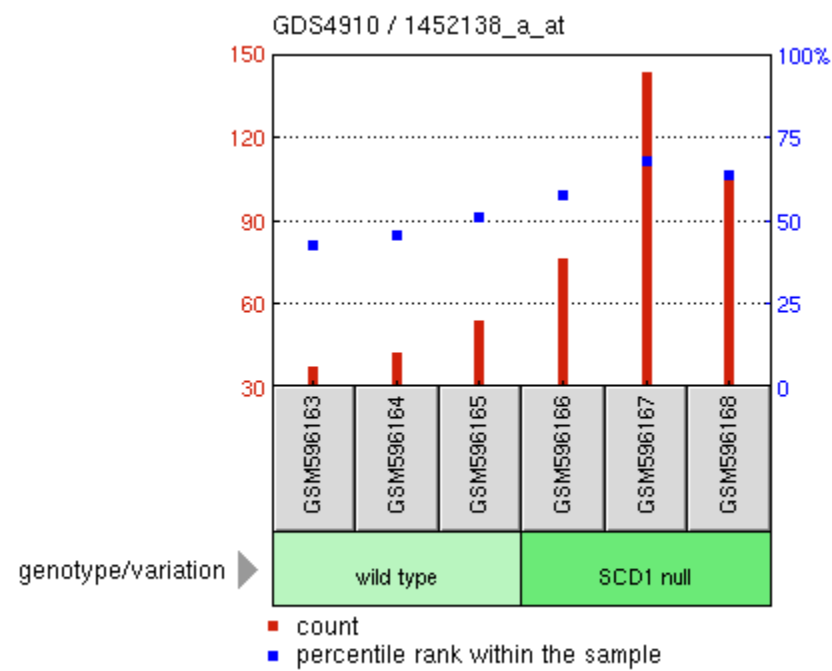
GDS4910 / 1452138_a_at

Title

Stearoyl-CoA desaturase-1 deficiency
effect on the skin

Organism

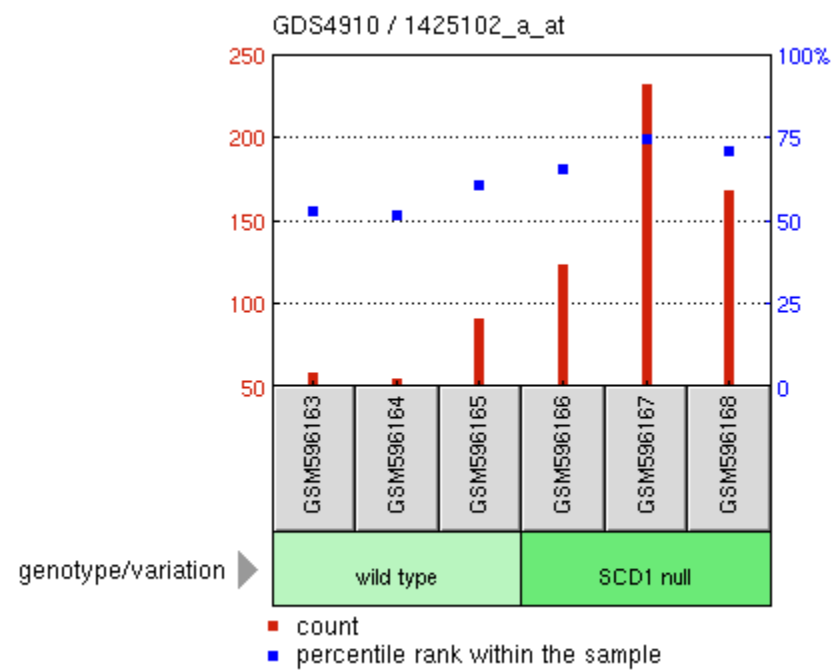
Mus musculus



Sample	Title	Value
GSM596163	Skin_Lox_Control_Rep1	37.453
GSM596164	Skin_Lox_Control_Rep2	42.992
GSM596165	Skin_Lox_Control_Rep3	53.967
GSM596166	Skin_SKO_Rep1	76.692
GSM596167	Skin_SKO_Rep2	143.908
GSM596168	Skin_SKO_Rep3	105.639

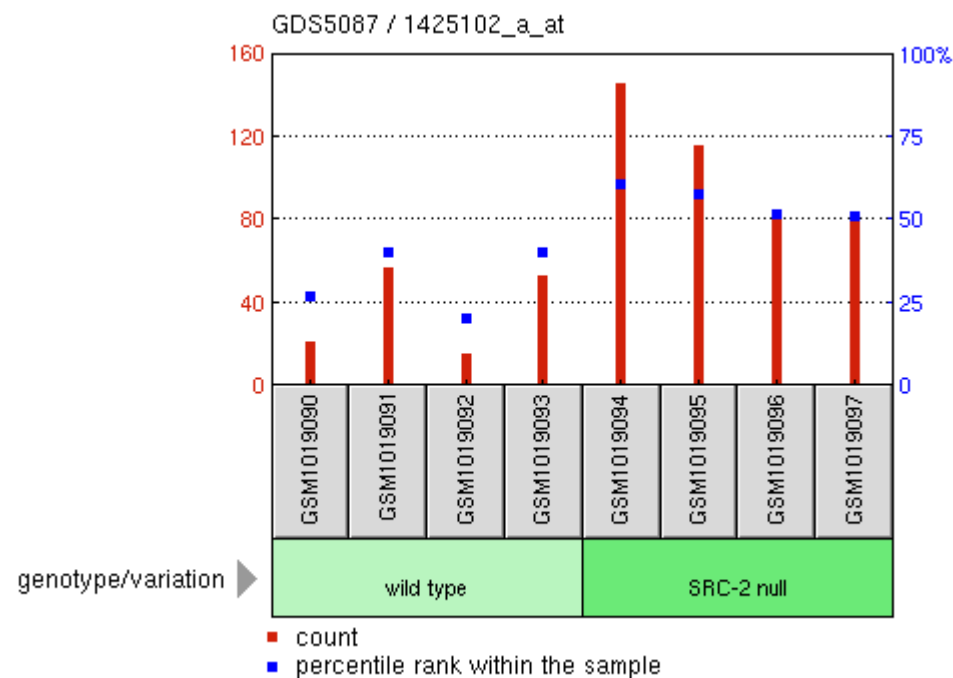
Profile: ACE2 expression
 GDS4910 / 1425102_a_at

Title
 Stearoyl-CoA desaturase-1 deficiency
 effect on the skin
 Organism
 Mus musculus



Sample	Title	Value
GSM596163	Skin_Lox_Control_Rep1	59.631
GSM596164	Skin_Lox_Control_Rep2	55.139
GSM596165	Skin_Lox_Control_Rep3	91.71
GSM596166	Skin_SKO_Rep1	123.983
GSM596167	Skin_SKO_Rep2	233.131
GSM596168	Skin_SKO_Rep3	168.429

Profile: ACE2 expression
GDS5087 / 1425102_a_at
Title
Transcriptional regulator steroid
receptor coactivator-2 deficiency
effect on the heart
Organism
Mus musculus



Sample	Title	Value
GSM1019090	Heart_WT_1	22.0184
GSM1019091	Heart_WT_2	57.5679
GSM1019092	Heart_WT_3	15.678
GSM1019093	Heart_WT_4	53.6421
GSM1019094	Heart_KO_1	145.776
GSM1019095	Heart_KO_2	116.278
GSM1019096	Heart_KO_3	85.0996
GSM1019097	Heart_KO_4	84.2244

Supplemental Figure S14. SARS-CoV-2
interactome:
332 genes encoding host protein preys of
the coronavirus SARS-CoV-2 proteins

David E. Gordon, Gwendolyn M. Jang, Mehdi Bouhaddou, Jiewei Xu, Kirsten Obernier, Matthew J. O'Meara, Jeffrey Z. Guo, Danielle L. Swaney, Tia A. Tummino, Ruth Huettenhain, Robyn M. Kaake, Alicia L. Richards, Beril Tutuncuoglu, Helene Foussard, Jyoti Batra, N. J. K. A SARS-CoV-2-Human Protein-Protein Interaction Map Reveals Drug Targets and Potential Drug Repurposing. (2020). doi: <https://doi.org/10.1101/2020.03.22.002386>

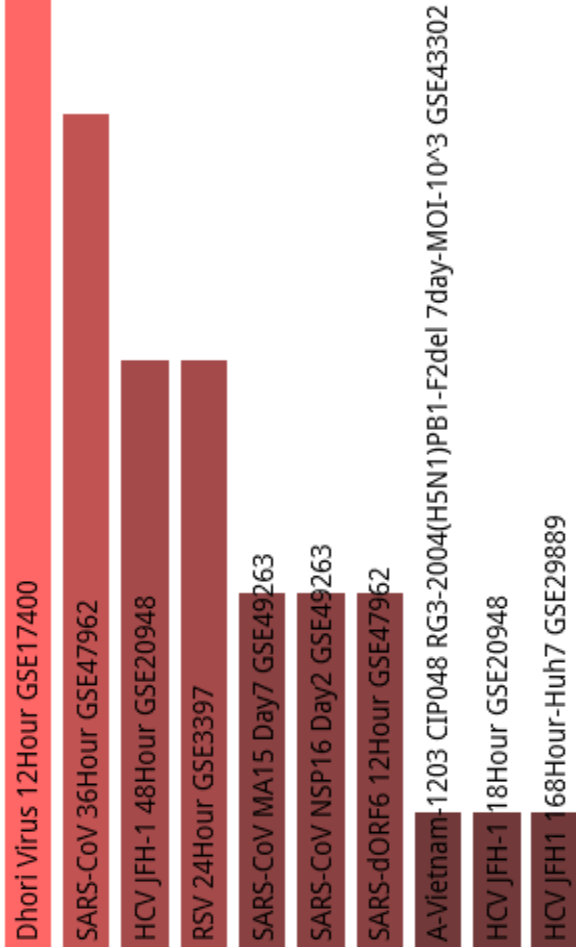
ABSTRACT

An outbreak of the novel coronavirus SARS-CoV-2, the causative agent of COVID-19 respiratory disease, has infected over 290,000 people since the end of 2019, killed over 12,000, and caused worldwide social and economic disruption^{1,2}. There are currently no antiviral drugs with proven efficacy nor are there vaccines for its prevention. Unfortunately, the scientific community has little knowledge of the molecular details of SARS-CoV-2 infection. To illuminate this, we cloned, tagged and expressed 26 of the 29 viral proteins in human cells and identified the human proteins physically associated with each using affinity-purification mass spectrometry (AP-MS), which identified 332 high confidence SARS-CoV-2-human protein-protein interactions (PPIs). Among these, we identify 67 druggable human proteins or host factors targeted by 69 existing FDA-approved drugs, drugs in clinical trials and/or preclinical compounds, that we are currently evaluating for efficacy in live SARS-CoV-2 infection assays. The identification of host dependency factors mediating virus infection may provide key insights into effective molecular targets for developing broadly acting antiviral therapeutics against SARS-CoV-2 and other deadly coronavirus strains.

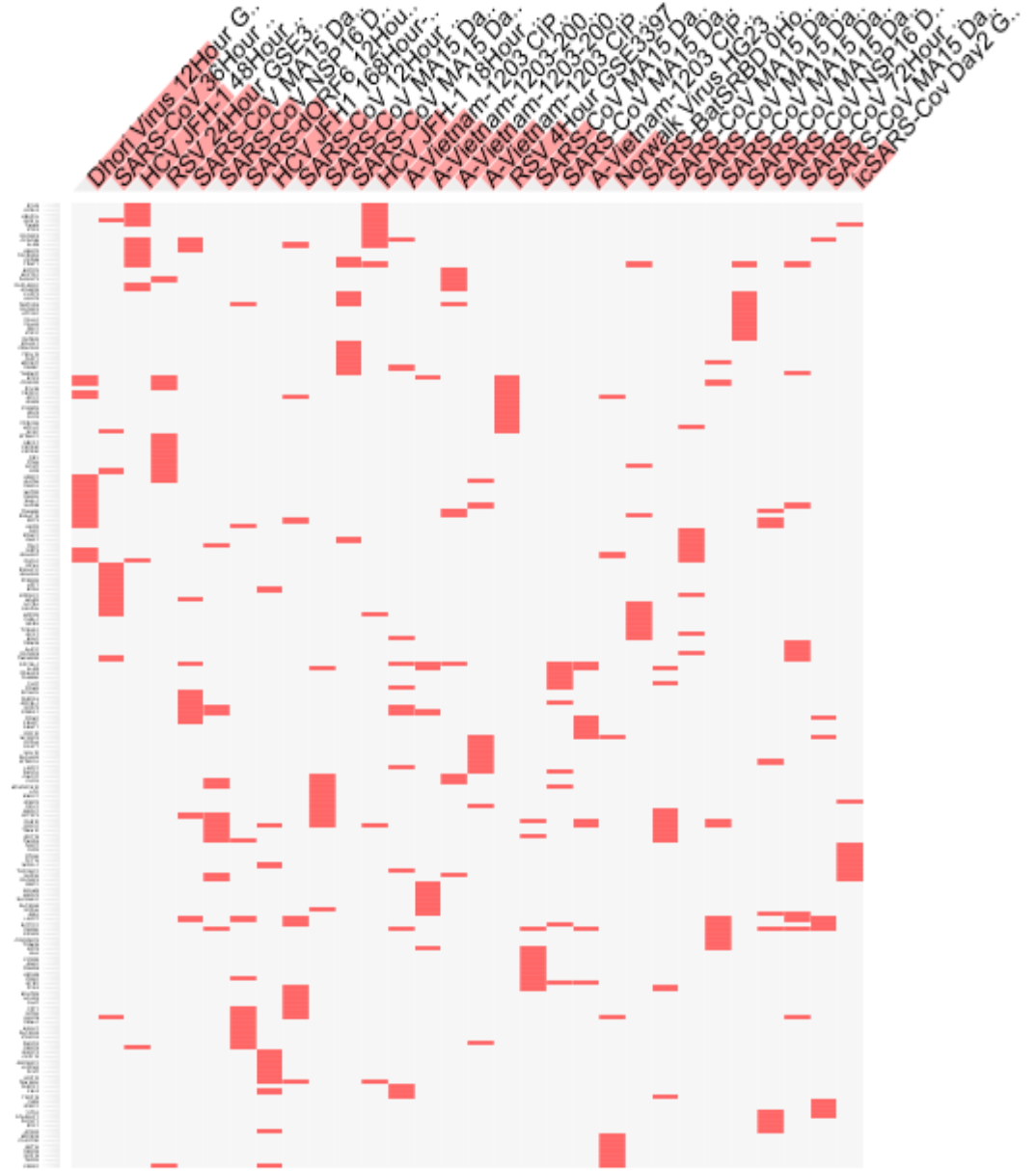
GSEA of the 332 genes encoding human prey proteins for 27 SARS-CoV-2 viral proteins.

Virus Perturbations from GEO up

Enriched Terms

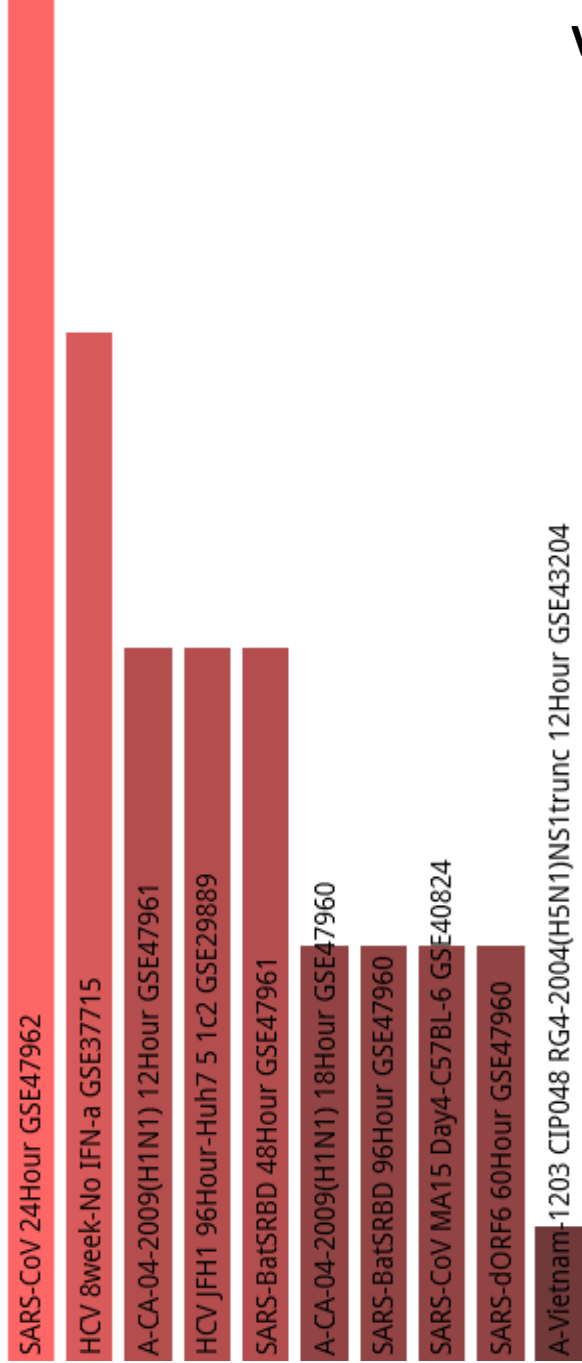


Input Genes

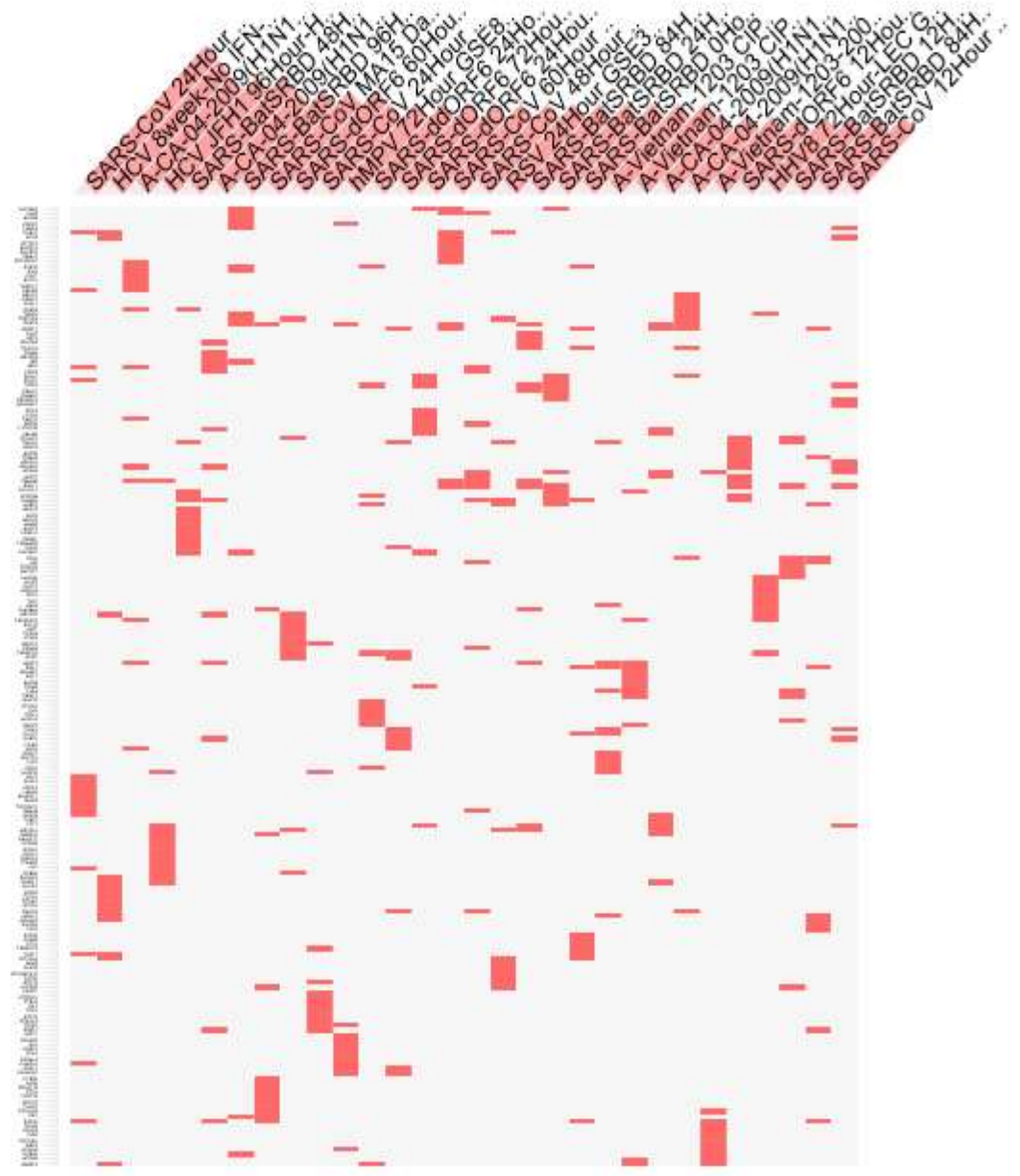


Virus Perturbations from GEO down

Enriched Terms



Input Genes



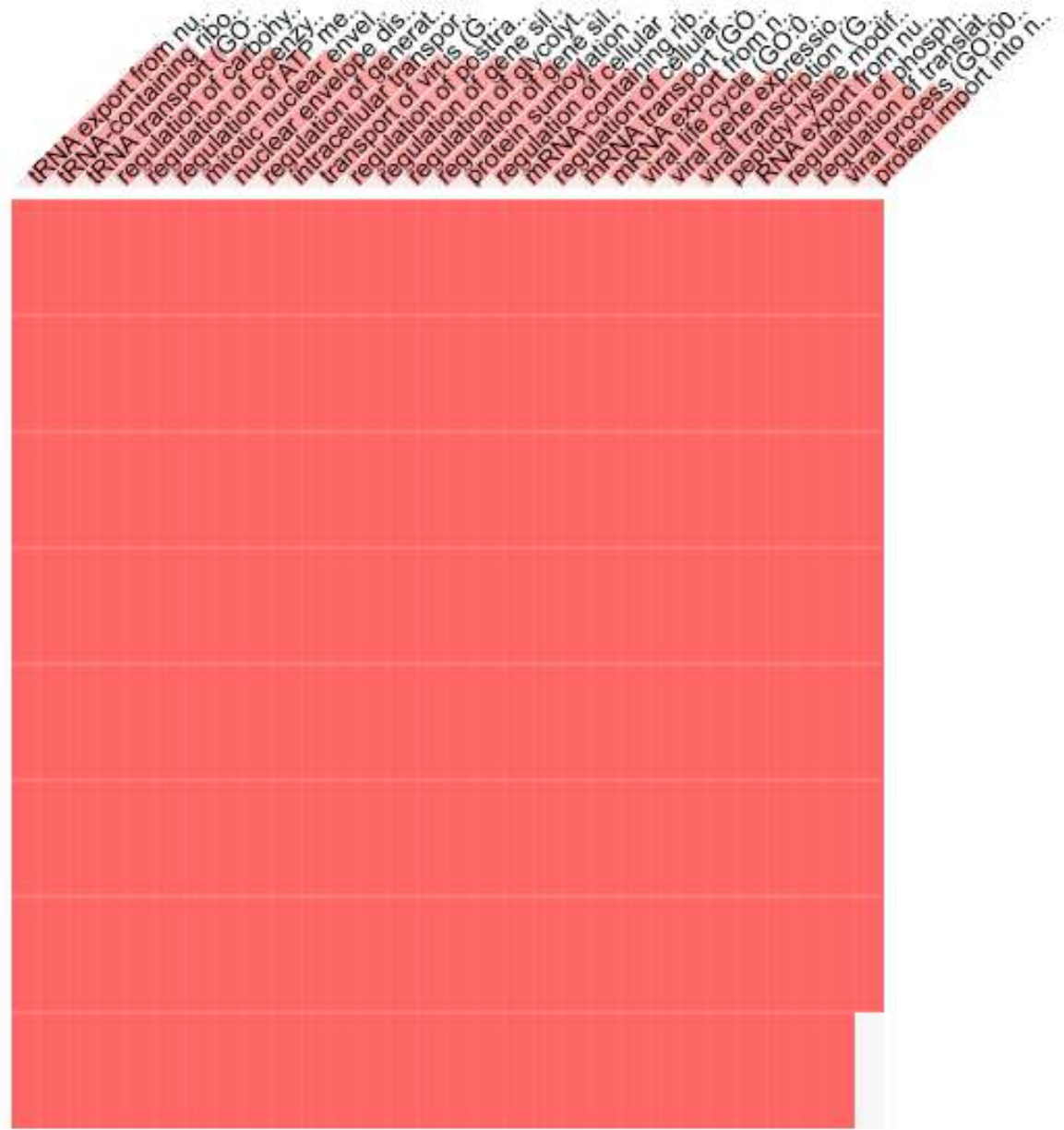
GO Biological Process 2018

Enriched Terms

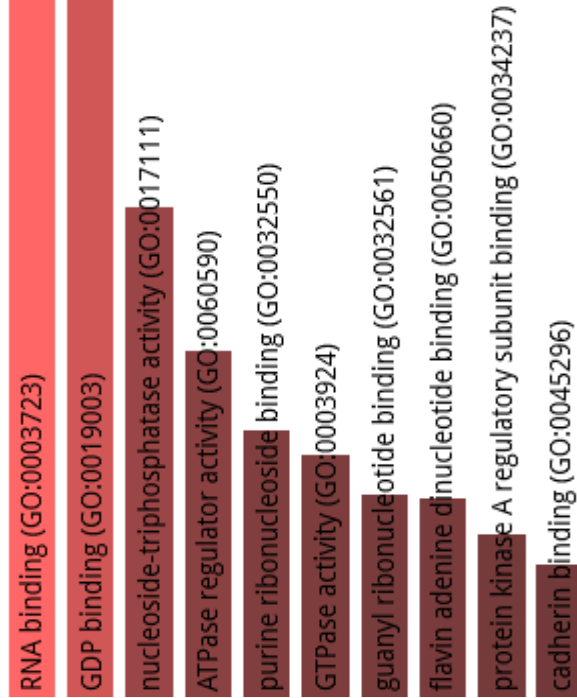
Bait	PreyGene
SARS-CoV2 nsp9	<i>NUP54</i>
SARS-CoV2 nsp9	<i>NUP214</i>
SARS-CoV2 nsp9	<i>NUP58</i>
SARS-CoV2 nsp9	<i>NUP62</i>
SARS-CoV2 nsp9	<i>NUP88</i>
SARS-CoV2 orf6	<i>NUP98</i>
SARS-CoV2 orf6	<i>RAE1</i>
SARS-CoV2 nsp4	<i>NUP210</i>

Input Genes

NUP54
NUP214
NUP58
NUP62
NUP88
NUP98
RAE1
NUP210

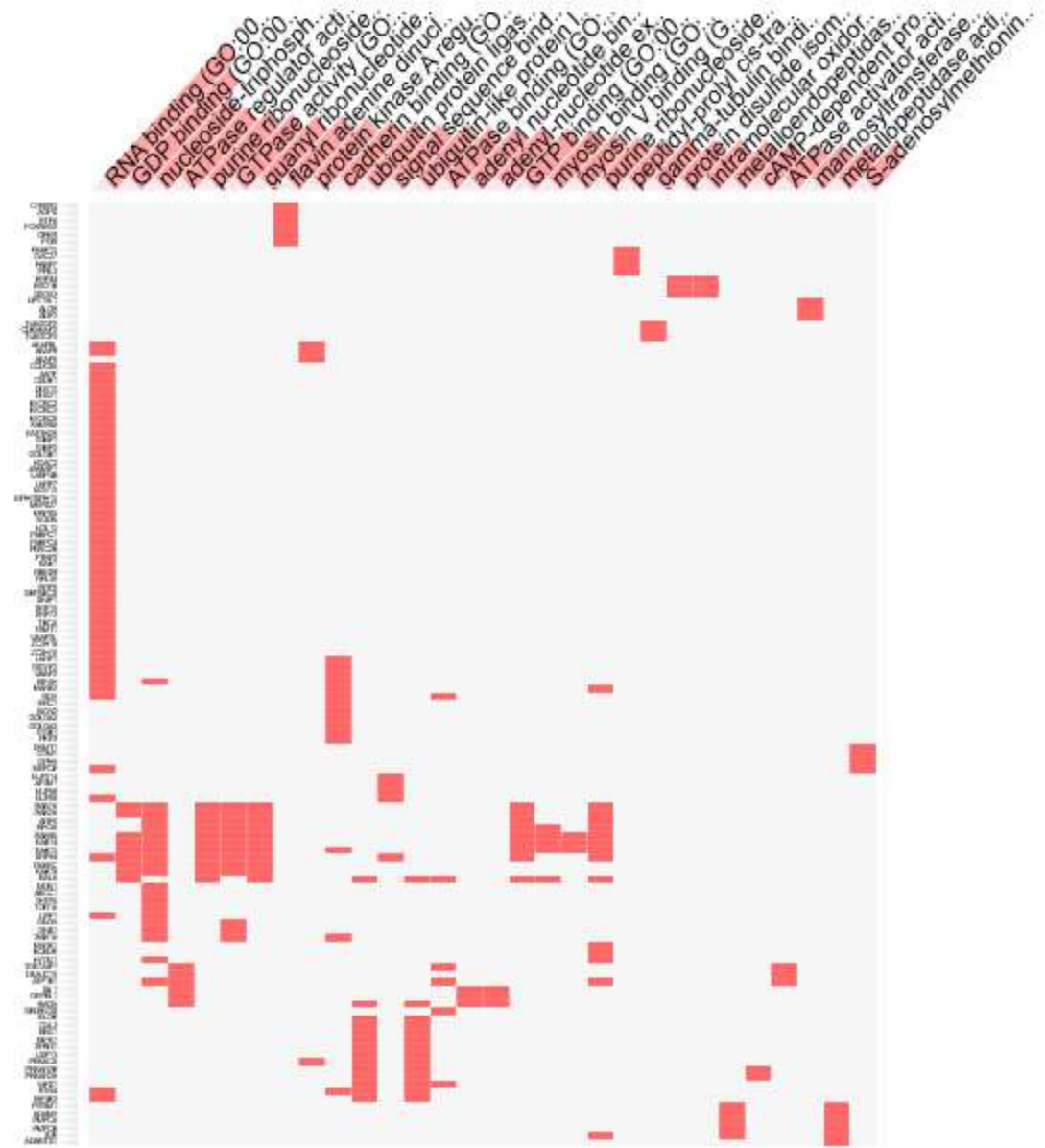


GO Molecular Function 2018



Enriched Terms

Input Genes

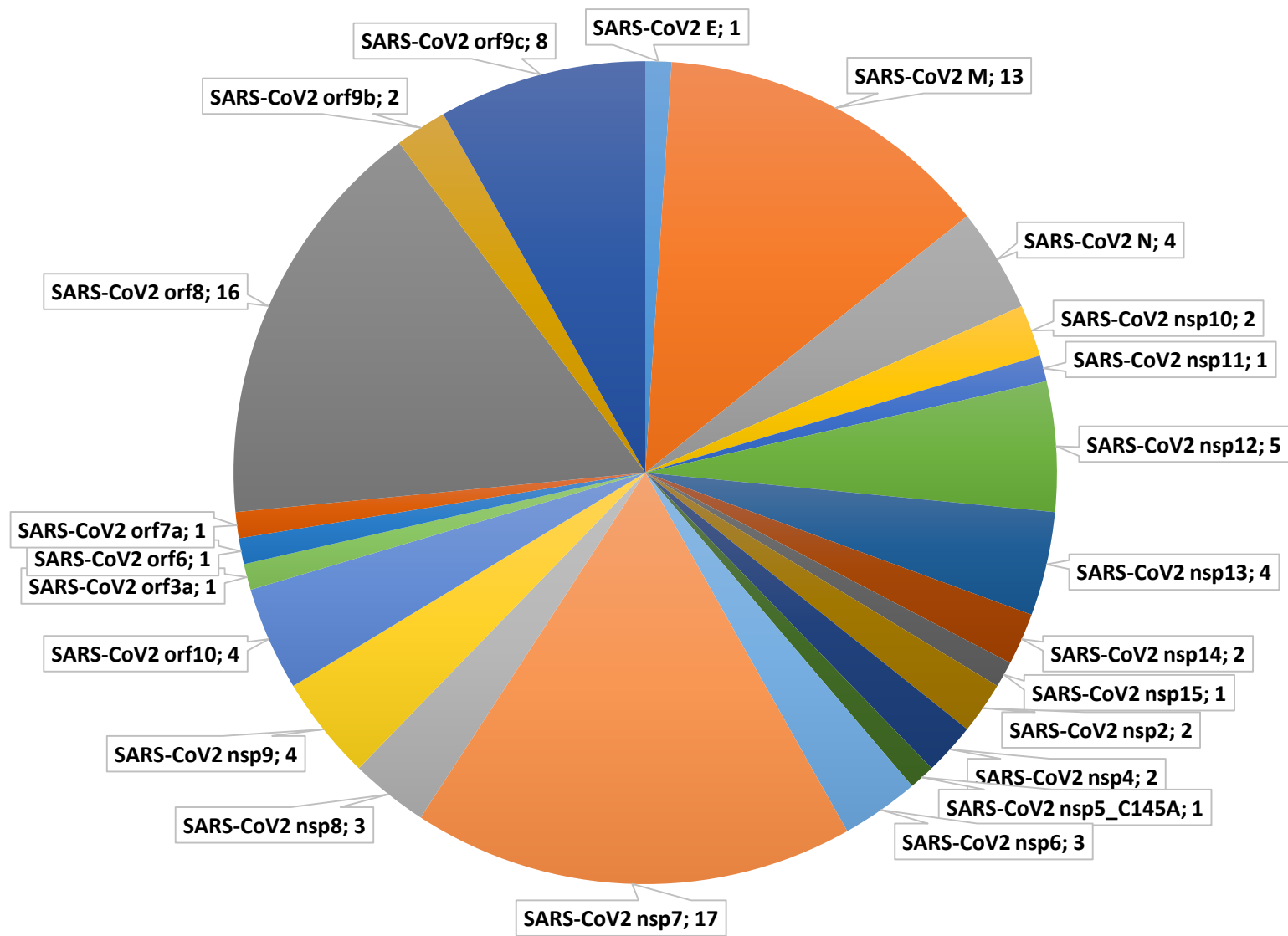


**SARS-CoV-2 interactome:
332 genes encoding host protein preys of
the coronavirus SARS-CoV-2 proteins**

**Quercetin alters expression of 98 of 332 (30%) genes encoding human protein preys
for 23 of 27 (85%) SARS-CoV-2 proteins**

A

**Quercetin alters expression of 98 of 332 (30%) genes encoding human protein
preys for 23 of 27 (85%) SARS-CoV-2 proteins**

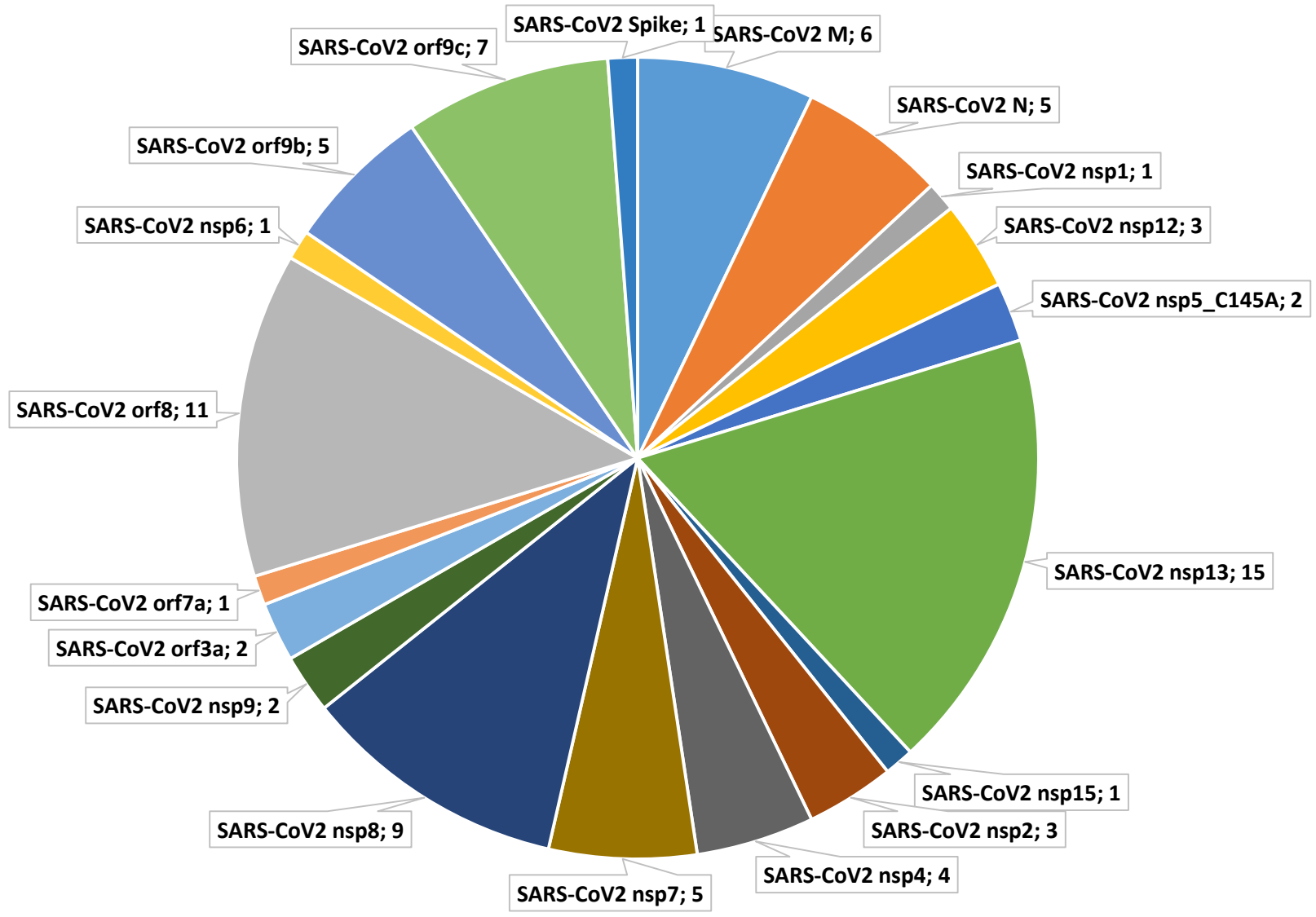


**SARS-CoV-2 interactome:
332 genes encoding host protein preys of
the coronavirus SARS-CoV-2 proteins**

**Vitamin D alters expression of 84 of 332 (25%) genes encoding human protein preys
for 19 of 27 (70%) SARS-CoV-2 proteins**

B

Vitamin D alters expression of 84 of 332 (25%) genes encoding human prey proteins for 19 of 27 (70%) of SARS-CoV-2 proteins



Effects of Estradiol on expression of genes encoding human prey proteins of the SARS-CoV-2 coronavirus.

Estradiol alters expression of 203 of 332 (61%) of genes encoding human prey proteins for 26 of 27 (96%) of SARS-CoV-2 proteins.

A

**Estradiol alters expression of 203 of 332 (61%) genes encoding human protein preys
for 26 of 27 (96%) SARS-CoV-2 proteins**

