

University of Groningen

Undifferentiated Embryonic Cell Transcription Factor 1 Regulates ESC Chromatin Organization and Gene Expression

Kooistra, Susanne M.; van den Boom, Vincent; Thummer, Rajkumar P.; Johannes, Frank; Wardenaar, Rene; Tesson, Bruno M.; Veenhoff, Liesbeth M.; Fusetti, Fabrizia; O'Neill, Laura P.; Turner, Bryan M.

Published in:
STEM CELLS

DOI:
[10.1002/stem.497](https://doi.org/10.1002/stem.497)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2010

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Kooistra, S. M., van den Boom, V., Thummer, R. P., Johannes, F., Wardenaar, R., Tesson, B. M., Veenhoff, L. M., Fusetti, F., O'Neill, L. P., Turner, B. M., de Haan, G., Eggen, B. J. L., & O'Neill, L. P. (2010). Undifferentiated Embryonic Cell Transcription Factor 1 Regulates ESC Chromatin Organization and Gene Expression. *STEM CELLS*, 28(10), 1703-1714. <https://doi.org/10.1002/stem.497>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

chromosome	gene name	NCBI gene ID
chr7	0610007P06Rik	67669
chr11	0610009J22Rik	71673
chr11	0610010K14Rik	104457
chr17	0610011F06Rik	68347
chr2	0610011L14Rik	68295
chr13	0610011N22Rik	67433
chr16	0610012G03Rik	106264
chr11	0610025P10Rik	216860
chr7	0710005I19Rik	71691
chr11	1110001A07Rik	66140
chr11	1110002N22Rik	68550
chr5	1110003E01Rik	68552
chr10	1110005A23Rik	66118
chr5	1110006O24Rik	66123
chr13	1110007C02Rik	71784
chr12	1110008B24Rik	73736
chr10	1110038D17Rik	68778
chr15	1110038F14Rik	117171
chr8	1200003I07Rik	66869
chr11	1300010M03Rik	67998
chr5	1300012G16Rik	71772
chr8	1300018I17Rik	72325
chr15	1300018J18Rik	223776
chr19	1500026D16Rik	68209
chr1	1500032H18Rik	69028
chr14	1700001E04Rik	75438
chr14	1700001F09Rik	71826
chr1	1700001G17Rik	67503
chrX	1700010D01Rik	76386
chr6	1700011F03Rik	74221
chr12	1700012B15Rik	74173
chr11	1700020L24Rik	66330
chr10	1700021K02Rik	65971
chr17	1700022C21Rik	76416
chr14	1700024B05Rik	75518
chr7	1700026D08Rik	75556
chr11	1700028N14Rik	73280
chr4	1700029I01Rik	70005
chr4	1700029M20Rik	73937
chr1	1700034H15Rik	74265
chr17	1700061G19Rik	78625
chr7	1700067C01Rik	76718
chr8	1700067K01Rik	73453
chr14	1700084P21Rik	73498
chr19	1700092M07Rik	74307
chr16	1700093J21Rik	74296
chr11	1700093K21Rik	67358
chr17	1700106N22Rik	73582
chr14	1700112N15Rik	239029
chr11	1700113I22Rik	73635
chr14	1700123O20Rik	58248

chr7	1700127D06Rik	76999
chr5	1810008K16Rik	67366
chr19	1810009A15Rik	66276
chr16	1810009K13Rik	66275
chr2	1810024B03Rik	329509
chr9	1810026J23Rik	69773
chr1	1810031K17Rik	69171
chr6	1810033M07Rik	69187
chr19	2010003J03Rik	69860
chr16	2010005H15Rik	76770
chr10	2010107G23Rik	69894
chr11	2010305C02Rik	380712
chr2	2210418O10Rik	76958
chr11	2300006N05Rik	69464
chr15	2310001L23Rik	77055
chr2	2310003C23Rik	76425
chr11	2310004I24Rik	66358
chr9	2310005P05Rik	67484
chr13	2310010B21Rik	69577
chr11	2310015J09Rik	71888
chr15	2310030B04Rik	332131
chr4	2310039E09Rik	68016
chr12	2310044G17Rik	217732
chr9	2310046O06Rik	78323
chr8	2310061F22Rik	66965
chr17	2310076L09Rik	66968
chr2	2400002F11Rik	66405
chr7	2410002F23Rik	66976
chr7	2410005H09Rik	232969
chr12	2410018L13Rik	69732
chr8	2410022L05Rik	66423
chr17	2410091C18Rik	73694
chr7	2410127E16Rik	76787
chr5	2410131K14Rik	76792
chr13	2410141K09Rik	76803
chr11	2600005N12Rik	70317
chr11	2600014M03Rik	69900
chr8	2610005L07Rik	381598
chr1	2610024A01Rik	72160
chr14	2610027L16Rik	67842
chr14	2610042L04Rik	545015
chr4	2610204G22Rik	70448
chr7	2610207I05Rik	233789
chr11	2610507B11Rik	72503
chr16	2610528E23Rik	66497
chr12	2810002N01Rik	68020
chr14	2810028N01Rik	72662
chr2	2810039F03Rik	241688
chr17	2810405J04Rik	72722
chr6	2810406C15Rik	68298
chr16	2810407A14Rik	70211
chr11	2810408A11Rik	70419

chr1	2810422O20Rik	69962
chr5	2810437L13Rik	68033
chr6	2810474O19Rik	67246
chr18	3110023G01Rik	71206
chr10	3110056O03Rik	73218
chr13	3110070M22Rik	67304
chr11	4121402D02Rik	74026
chr11	4631426H08Rik	70810
chr8	4632415K11Rik	74347
chr8	4632417N05Rik	74032
chr10	4632428N05Rik	74048
chr15	4732484G22Rik	406220
chr11	4732494G06Rik	237934
chr11	4733401H21Rik	70831
chr1	4831428F09Rik	240894
chr2	4921504E06Rik	70909
chr7	4921507A12	330513
chr2	4921509C19Rik	381393
chr3	4921515J06Rik	66715
chr8	4921524J17Rik	66714
chr7	4930403C10Rik	73813
chr1	4930413O22Rik	67986
chr13	4930451E10Rik	78111
chr16	4930451G09Rik	74684
chr8	4930467E23Rik	626415
chr14	4930474N05Rik	218921
chr3	4930518C23Rik	319210
chr8	4930518F22Rik	71655
chr17	4930539E08Rik	207819
chr9	4930542C12Rik	67648
chr4	4930549C01Rik	67663
chr7	4930549O06	233164
chr14	4930555G01Rik	108978
chr2	4930556L07Rik	75283
chr9	4930563M21Rik	75258
chr9	4930579K19Rik	75881
chr7	4930583K01Rik	67745
chr14	4931406H21Rik	77592
chr5	4931427P12Rik	622474
chr11	4932414J04Rik	237694
chrY_random	4932431L22Rik	619557
chr8	4933403G14Rik	74393
chr4	4933409K07Rik	108816
chr6	4933424B01Rik	71177
chr3	4933425K02Rik	74446
chr4	4933427I04Rik	664620
chr11	4933429E10Rik	380701
chr12	4933433P14Rik	66787
chr5	5031410I06Rik	381622
chr7	5430419D17Rik	71395
chr2	5430432M24Rik	73847
chr1	5430435G22Rik	226421

chr15	5730410E15Rik	319613
chr12	5730410I19Rik	66622
chr14	5730420B22Rik	70561
chr13	5730427N09Rik	59050
chr12	5730507C01Rik	236366
chr19	5830428H23Rik	414758
chr5	5830443L24Rik	76074
chr1	5830484A20Rik	109032
chr8	5832418A03Rik	244550
chr10	5930403N24Rik	320504
chr4	6030445D17Rik	320133
chr8	6030452D12Rik	330837
chr17	6030490I01Rik	240064
chr4	6330404A07Rik	70754
chr14	6330416L11Rik	70713
chr7	6330581L23Rik	233056
chr16	6430553K19Rik	619300
chr9	6430571L13Rik	235599
chrX	6530401D17Rik	76219
chr7	6820429M01	233905
chr9	7420426K07Rik	546157
chr2	8430406I07Rik	74528
chr17	9030025P20Rik	381062
chr10	9030224M15Rik	327747
chr5	9030227G01Rik	320336
chr19	9130011E15Rik	71617
chr8	9130011J15Rik	66818
chr8	9130404D08Rik	74549
chr2	9230107O10Rik	319579
chr19	9230117N10Rik	77125
chr1	9430069J07Rik	211383
chr4	9530002B09Rik	77432
chr9	9530015I07Rik	619310
chr11	9530066K23Rik	214112
chr9	9630041A04Rik	442798
chr1	9630058J23Rik	226744
chr12	9830169C18Rik	217705
chr19	9930021J03Rik	240613
chr4	9930104L06Rik	194268
chr15	9930109F21Rik	270328
chr13	A030007L22	328264
chr10	A130042E20Rik	216119
chr9	A230050P20Rik	319278
chr7	A230107C01Rik	320225
chr3	A430025D11Rik	214191
chr5	A430033K04Rik	243308
chr12	A430041B07Rik	328108
chr5_random	A430089I19Rik	331195
chr19	A430093F15Rik	403202
chr8	A430108E01Rik	384382
chr1	A530032D15Rik	381287
chr1	A530040E14Rik	621875

chr13	A530095I07Rik	210373
chr9	A630095E13Rik	235973
chr7	A830073O21Rik	320262
chr17	A930017K11Rik	240054
chr15	A930017M01Rik	239410
chr11	A930041G11Rik	319922
chr2	AA467197	433470
chr17	Abca17	381072
chr8	Abcc12	244562
chr16	Abcc5	27416
chr6	Abcg2	26357
chr1	Abi2	329165
chr6	Abp1	76507
chr5	Acad10	71985
chr9	Acad11	102632
chr11	Accn1	11418
chr15	Accn2	11419
chr14	Acin1	56215
chr15	Aco2	11429
chr17	Acsbg2	328845
chr2	Acss1	68738
chr2	Acss2	60525
chr11	Actg1	11465
chr19	Actn3	11474
chr12	Actr10	56444
chr19	Actr1a	54130
chr10	Actr6	67019
chr9	Acy1	109652
chr2	Adam33	110751
chr8	Adam9	11502
chr11	Adamts2	216725
chr15	Adamts20	223838
chr1	Adhfe1	76187
chr8	Adrb3	11556
chr8	AF366264	231201
chr2	Agbl2	271813
chr17	Agpat1	55979
chr2	AI182371	98870
chr5	AI428795	209683
chr12	AI450948	382643
chr15	AI451006	105847
chr7	AI467606	101602
chr9	AI593442	330941
chr11	AI595406	237730
chr15	AI836003	239650
chr12	AI839735	104885
chr19	AI846148	68229
chr15	AI987692	331063
chr13	Akr1c14	105387
chr7	Akt1s1	67605
chr15	Alg12	223774
chr16	Alg3	208624

chr11	Alox15	11687
chr1	Als2cr11	73463
chr10	Amdhd1	71761
chr17	Amdhd2	245847
chr9	Amica1	270152
chr15	Amigo2	105827
chr12	Amn	93835
chr3	Ampd1	229665
chr3	Amy1	11722
chr3	Amy2	11723
chr11	Anapc11	66156
chr2	Anapc2	99152
chr17	Angptl4	57875
chr8	Ank1	11733
chr19	Ankrd1	107765
chr10	Ankrd24	70615
chr3	Ankrd34	545554
chr11	Ankrd43	237761
chr16	Anks3	72615
chr6	Antxr1	69538
chr1	Aox4	71872
chr11	Ap1gbp1	217030
chr1	Ap1s3	252903
chr18	Apbb3	225372
chr10	Apc2	23805
chr14	Apex1	11792
chr7	Aplp1	11803
chr5	Aps	23921
chrX	Araf	11836
chr19	Arhgap19	71085
chr8	Arhgef10	234094
chr11	Arhgef15	442801
chr9	Arid3b	56380
chr9	Arih1	23806
chr6	Arl6ip5	65106
chr5	Arl9	384185
chr8	Armc6	76813
chr6	Arpc4	68089
chr11	Arrb2	216869
chr13	Arsb	11881
chr6	Asb15	78910
chr2	Ascc3l1	320632
chr4	Atad3a	108888
chr6	Atf7ip	54343
chr16	Atg3	67841
chr7	Atp1a3	232975
chrX	Atp2b3	320707
chr11	Atp5h	71679
chr9	Atp5l	27425
chr5	Atp6v0a2	21871
chr6	Atp6v0a4	140494
chr12	Atp6v1d	73834

chr17	Atp6v1g2	66237
chr16	AU021092	239691
chr2	Aurka	20878
chr5	Auts2	319974
chr19	AW125688	381199
chr8	AW495713	102323
chr10	AY053573	380674
chr9	AY074887	246735
chr5	AY616753	433899
chr8	AY761184	382000
chr8	B230317F23Rik	320383
chr5	B230342M21Rik	100637
chr17	B230354K17Rik	320063
chr17	B3galt4	54218
chr7	B430201F14	330503
chr7	B430211C08Rik	627280
chr6	B4galnt3	330406
chr4	B4galt2	53418
chr4	Bag1	12017
chr12	Bag5	70369
chr15	Bai1	107831
chr19	Banf1	23825
chr8	Banp	53325
chr2	Barhl1	54422
chr17	Bat2	53761
chr19	Bbs1	52028
chr17	BC002059	213811
chr4	BC002163	170658
chr9	BC005471	235050
chr2	BC005624	227707
chr17	BC011248	224823
chr17	BC018101	449000
chr4	BC020077	230500
chr7	BC023179	232855
chr3	BC023814	229503
chr15	BC025446	223631
chr7	BC025462	208836
chr8	BC025546	234728
chr2	BC027342	241274
chr11	BC029169	208659
chr2	BC029214	227622
chr10	BC030440	210035
chr15	BC032281	223887
chr8	BC035537	212326
chr1	BC038286	227298
chr15	BC038822	239647
chr9	BC043934	270185
chr6	BC049816	232313
chr17	BC052046	240063
chr16	BC052055	328643
chr1	BC055324	381306
chr5	BC061212	381724

chrX	BC065397	436230
chr7	BC066140	233826
chr15	BC085284	278679
chr3	Bcan	12032
chr7	Bckdha	12039
chr9	Bcl2a1a	12044
chr9	Bcl2a1b	12045
chr5	Bcl7a	77045
chr7	Bcl7c	12055
chr7	Bet1l	54399
chr3	Bglap1	12096
chr3	Bglap2	12097
chr3	Bglap-rs1	12095
chr6	Bid	12122
chr19	Blnk	17060
chr6	Bmp10	12154
chr14	Bnip3l	12177
chr2	Bpil1	66557
chr5	Brap	72399
chr11	Brca1	12189
chr5	Brdt	114642
chr7	Brsk1	381979
chr7	Brsk2	75770
chr9	Brunol6	76183
chr16	Brwd1	93871
chr9	Bsx	244813
chr12	Btbd5	66689
chr12	Btbd6	399566
chr4	Btf3l4	70533
chr1	Btg2	12227
chr17	Btnl2	547431
chr13	C030011J08Rik	77318
chr1	C130026I21Rik	75307
chr2	C1ql3	227580
chr6	C1r	50909
chr6	C1rl	232371
chr17	C230013L11Rik	319712
chr1	C230030N03Rik	241052
chr13	C330014B19Rik	382770
chr7	C330019L16Rik	208111
chr7	C530028I08Rik	232933
chr12	C630028L02Rik	319361
chr2	C630035N08Rik	109349
chr9	C630041L24Rik	78709
chr2	C730025P13Rik	227615
chr7	C730027J19Rik	272428
chr19	C730048C13Rik	319800
chr14	C920008G01Rik	320734
chr4	Calb1	12307
chr2	Capn3	12335
chr5	Card11	108723
chr13	Cart	27220

chr11	Casc3	192160
chr3	Casq2	12373
chr13	Catsper3	76856
chr2	Cbln4	228942
chr11	Cbr2	12409
chr11	Ccdc103	73293
chr10	Ccdc38	237465
chr11	Ccdc46	76380
chr11	Ccdc49	67480
chr15	Ccdc65	105833
chr9	Ccdc84	382073
chr7	Ccdc9	243846
chr7	Ccdc97	52132
chr4	Ccl21a	20298
chr4	Ccl21b	18829
chr4	Ccl21c	65956
chr4	Ccl27	20301
chr11	Ccl4	20303
chr11	Ccl5	20304
chr11	Ccl7	20306
chr15	Ccnt1	12455
chr9	Ccr9	12769
chr8	Cd209a	170786
chr11	Cd300lf	246746
chr19	Cd5	12507
chr4	Cd52	23833
chr11	Cd68	12514
chr1	Cd84	12523
chr4	Cdc20	107995
chr10	Cdc2a	12534
chr4	Cdc2l1	12537
chr10	Cdc34	216150
chr4	Cdc42	12540
chr19	Cdc42ep2	104252
chr16	Cdc45l	12544
chr17	Cdc5l	71702
chr11	Cdc6	23834
chr14	Cdca2	108912
chr19	Cdca5	67849
chr4	Cdca8	52276
chr8	Cdh1	12550
chr10	Cdk4	12567
chr5	Cdk5	12568
chr13	Cdkal1	68916
chr17	Cdkl4	381113
chr17	Cebpz	12607
chr5	Centa1	231821
chr16	Centb2	78618
chr5	Cep135	381644
chr19	Cep55	74107
chr19	Cep78	208518
chr11	Chad	12643

chr6	Chchd3	66075
chr6	Chchd4	72170
chr8	Cherp	27967
chr7	Chmp2a	68953
chr4	Chmp5	76959
chr15	Chrac1	93696
chr6	Chrm2	243764
chr1	Chrnd	11447
chr5	Chst12	59031
chr10	Chst3	53374
chr10	Cirbp	12696
chr7	Ckap1	66411
chr2	Ckmt1	12716
chr8	Clcn3	12725
chr7	Clcn4-2	12727
chr14	Cldn10	58187
chr11	Cldn7	53624
chr9	Clec3b	21922
chr11	Clm3	382551
chr17	Clpp	53895
chr13	Cmah	12763
chr6	Cml3	93674
chr4	Cngb3	30952
chr6	Cnot4	53621
chr11	Cntrob	216846
chr11	Coasy	71743
chr7	Cog7	233824
chr8	Cog8	97484
chr1	Col4a3	12828
chr1	Col4a4	12829
chr9	Copb2	50797
chr8	Cope	59042
chr1	Cops5	26754
chr2	Coq4	227683
chr12	Coq6	217707
chr9	Coro2b	235431
chr8	Cox4i1	12857
chr8	Cox4nb	18117
chr6	Cpa5	74649
chr4	Cpne3	70568
chr15	Creld2	76737
chr10	Cs	12974
chr15	Csf2rb2	12984
chr10	Csl	71832
chr8_random	Csprs	114564
chr2	Cstf1	67337
chr2	Cstf3	228410
chr7	Ctf1	13019
chr10	Ctgf	14219
chr1	Ctla4	12477
chr14	Ctsg	13035
chr11	Cuedc1	103841

chr17	Cul7	66515
chr5	Cyp3a16	13114
chr5	Cyp3a25	56388
chr5	Cyp3a41	53973
chr14	Cysltr2	70086
chr11	D11Bwg0280e	52915
chr11	D11Bwg0434e	52898
chr11	D11Lgp1e	80860
chr13	D13Wsu177e	28126
chr14	D14Ert581e	52023
chr15	D15Ert5785e	52683
chr17	D17H6S56E-5	110956
chr19	D19Wsu162e	226178
chr14	D230005D02Rik	239188
chr2	D2Wsu81e	227695
chr6	D430015B01Rik	58909
chr7	D430041B17Rik	232813
chr4	D4Bwg0951e	52829
chr2	D4st1	72136
chr4	D4Wsu114e	28010
chr5	D5Wsu178e	28042
chr5	D830014E11Rik	320751
chr14	D830030K20Rik	320333
chr17	Daam2	76441
chr4	Dctn3	53598
chr7	Dctn5	59288
chr3	Dcun1d1	114893
chr12	Ddef2	211914
chr8	Ddx49	234374
chr11	Ddx52	78394
chr1	Dedd	21945
chr7	Dedd2	67379
chr2	Defb28	545475
chr8	Defb7	246080
chr8	Defcr3	13237
chr8	Defcr5	13239
chr8	Defcr-rs1	13218
chr8	Defcr-rs12	13221
chr8	Defcr-rs7	13226
chr1	Degs1	13244
chr5	Denr	68184
chr2	Dgkz	104418
chr14	Dhrs1	52585
chr11	Dhrs7c	68460
chr17	Dhx57	106794
chr2	Dido1	23856
chr4	Dio1	13370
chr10	Dip3b	216190
chr10	Diras1	208666
chr12	Dld	13382
chr14	Dlg7	218977
chr17	Dll1	13388

chr11	Dlx3	13393
chr7	Dmbt1	12945
chr4	Dmbx1	140477
chr7	Dmn	233335
chr5	Dmp1	13406
chr7	Dmwd	13401
chr4	Dnaja1	15502
chr4	Dnajc11	230935
chr4	Dnajc6	72685
chr2	Dnm1	13429
chr9	Dnm2	13430
chr2	Dnttip1	76233
chr12	Dock4	238130
chr8	Dpep3	71854
chr11	Dph1	116905
chr19	Dpp3	75221
chr18	Dpysl3	22240
chr13	Drd1a	13488
chr5	Drd5	13492
chr11	Drg2	13495
chr4	Dscr1l2	53902
chr16	Dscr2	56088
chr12	Dtnb	13528
chr7	Dub2a	384701
chr2	Dut	110074
chr17	Dynlt1	21648
chr9	E130103l17Rik	319845
chr5	E130309D02Rik	231868
chr4	E130310K16Rik	269513
chr12	E2f6	50496
chr15	E430012M05Rik	321003
chr16	Ece2	107522
chr1	Edem3	66967
chr4	Edg2	14745
chr10	Edg6	13611
chr9	Edg8	94226
chr1	Eef1b2	55949
chr15	Eef1d	66656
chr11	Efnb3	13643
chr11	Eftud2	20624
chr3	Egf	13645
chr16	Eif2b5	224045
chr12	Eif2s1	13665
chr15	Eif3s7	55944
chr12	Eif5	217869
chr1	Eif5b	226982
chr4	Ela3	67868
chr9	Elavl3	15571
chr2	Elmo2	140579
chr9	Elmod1	270162
chr10	Enpp3	209558
chr19	Entpd7	93685

chr9	Ephb1	270190
chr7	Eps8l1	67425
chr16	Ercc4	50505
chr4	Errfi1	74155
chr16	Es2el	27886
chr4	Espn	56226
chr18	Etf1	225363
chr9	Etfa	110842
chr7	Ethe1	66071
chr1	Etnk2	214253
chr11	Evi2a	14017
chr11	Evi2b	216984
chr7	Exosc5	27998
chr3	Exosc9	50911
chr11	Expi	14038
chr17	F420015M19Rik	619329
chr10	F730021E23Rik	619323
chr7	F730035P03Rik	442845
chr11	F830116E18Rik	544763
chr17	Fahd1	68636
chr19	Fau	14109
chr11	Fbf1	217335
chr9	Fbxl12	30843
chr5	Fbxl18	231863
chr18	Fbxo15	50764
chr5	Fbxw8	231672
chr8	Fcer2a	14128
chr9	Fez1	235180
chr16	Fgd4	224014
chr16	Fgf12	14167
chr10	Fgf22	67112
chr6	Fgfr1op2	67529
chr6	Figla	26910
chr15	Fkbp11	66120
chr5	Flt3	14255
chr13	Foxd1	15229
chr9	Foxred1	235169
chr2	Frmd4a	209630
chr6	Frmd4b	232288
chr17	Frs3	107971
chr7	Fut2	14344
chr4	Fv1	14349
chr16	Fytd1	69823
chrX	G530011O06Rik	654820
chr11	Gabra1	14394
chr11	Gabrg2	14406
chr10	Galnt4	14426
chr2	Ganc	76051
chr12	Garnl1	56784
chr13	Gfm2	320806
chr2	Ggtl3	207182
chr8	Glg1	20340

chr12	Glr5	73046
chr10	Gls2	216456
chr3	Glt28d2	320302
chr10	Gm1103	381990
chr7	Gm1961	381838
chr12	Gm1964	432628
chr13	Gm273	218268
chr7	Gm397	245109
chr16	Gm603	239731
chr16	Gm609	208166
chr2	Gm691	277432
chrX	Gm732	213450
chr6	Gm839	330379
chr13	Gm906	380882
chr1	Gm973	381260
chr17	Gna-rs1	14670
chr2	Gnas	14683
chr3	Gnat2	14686
chr5	Gnb2	14693
chr11	Gnb2l1	14694
chr3	Gnb4	14696
chr10	Gnn	103220
chr9	Golga4	54214
chr8	Golga7	57437
chr15	Gpaa1	14731
chr4	Gpbp111	77110
chr17	Gpr111	435529
chr13	Gpr137b	83924
chr16	Gpr156	239845
chr7	Gpr41	233080
chr19	Gpr44	14764
chr11	Gpr75	237716
chr13	Gprin1	26913
chr7	Gramd1a	52857
chr12	Greb1	268527
chr10	Grin3b	170483
chr10	Grip1	74053
chr10	Grm1	14816
chr5	Grpel1	17713
chr11	Gsdm3	450219
chr9	Gsta4	14860
chr16	Gtf2e1	74197
chr5	Gtf2ird2	114674
chr8	Gtpbp3	70359
chr5	Gtpbp6	107999
chr17	Guca1b	107477
chr4	Guca2a	14915
chr18	Gypc	71683
chr17	H2-D1	14964
chr17	H2-D4	14967
chr17	H2-DMb1	14999
chr17	H2-DMb2	15000

chr17	H2-Ea	14968
chr17	H2-Ke2	14976
chr17	H2-M2	14990
chr17	H2-Q1	15006
chr17	H2-Q5	15016
chr17	H2-Q6	110557
chr17	H2-Q7	15018
chr17	H2-T23	15040
chr17	H2-T3	15043
chr17	H2-Tw3	547339
chr5	Hadha	97212
chr5	Hadhb	231086
chr17	Hagh	14651
chr11	Hap1	15114
chr3	Hax1	23897
chr17	Hcfc1r1	353502
chr18	Hdhd1a	67365
chr9	Hemk1	69536
chr11	Hexim1	192231
chr3	Hey1	15213
chr11	Hgs	15239
chr13	Higd2a	67044
chr13	Hist1h1a	80838
chr13	Hist1h1e	50709
chr13	Hist1h2ac	319164
chr13	Hist1h2ag	319167
chr13	Hist1h2ah	319168
chr13	Hist1h2ai	319191
chr13	Hist1h2be	319179
chr13	Hist1h2bj	319183
chr13	Hist1h2bk	319184
chr13	Hist1h2bl	319185
chr13	Hist1h3a	360198
chr13	Hist1h3e	319151
chr13	Hist1h3h	319152
chr13	Hist1h4a	326619
chr13	Hist1h4i	319158
chr3	Hist2h2aa1	15267
chr3	Hist2h2aa2	319192
chr3	Hist2h3c1	15077
chr3	Hist2h3c2	97114
chr11	Hist3h2a	319162
chr11	Hist3h2ba	78303
chr11	Hist3h2bb	382522
chr4	Hkr3	100090
chr4	Hmgn2	15331
chr11	Hmmr	15366
chr19	Hnrpul2	68693
chr6	Hoxa3	15400
chr6	Hoxa6	15403
chr11	Hoxb2	103889
chr11	Hoxb3	15410

chr11	Hoxb4	15412
chr11	Hoxb8	15416
chr15	Hoxc9	15427
chr2	Hoxd4	15436
chr4	Hpca	15444
chr5	Hrbl	231801
chr7	Hrc	15464
chr3	Hs2st1	23908
chr5	Hs3st1	15476
chr8	Hsbp1	68196
chr3	Hsd3b2	15493
chr10	Hsp90b1	22027
chr16	Htf9c	15547
chr5	Hvcn1	74096
chr19	I830134H01Rik	619304
chr1	Icos	54167
chr4	Ifnab	15974
chr7	Ifnl2	330496
chr4	Ifnz	319146
chr11	Ift20	55978
chr5	Igfbp7	29817
chr4	Igfbpl1	75426
chr7	Igsf4c	260299
chr16	Igsf4d	239857
chr9	Igsf9b	235086
chr1	Ii10	16153
chr10	Ii22	50929
chr1	Ii8ra	227288
chr9	Iif3	16201
chr1	Iikap	67444
chr10	Iitifb	116849
chr3	Impa1	55980
chr6	Ing3	71777
chr5	Ipf1	18609
chr5	Iqcd	75732
chr9	Ireb2	64602
chr3	Isg20l2	229504
chr9	Itga11	319480
chr9	Jam3	83964
chr8	Jph3	57340
chr14	Jub	16475
chr2	Kcna4	16492
chr11	Kcnab3	16499
chr7	Kcnc3	16504
chr3	Kcnd3	56543
chr11	Kcnh6	192775
chr16	Kcnj15	16516
chr11	Kcnj16	16517
chr15	Kcnj4	16520
chr6	Kcnj8	16523
chr18	Kcnn2	140492
chr7	Kcnq1	16535

chr2	Kcnq2	16536
chr15	Kcns2	16539
chr11	Kctd11	216858
chr11	Kctd2	70382
chr14	Kctd9	105440
chr15	Kdelr3	105785
chr4	Khdrbs1	20218
chr4	Kif17	16559
chr4	Kif1b	16561
chr13	Kif2a	16563
chr9	Kif9	16578
chr19	Klc2	16594
chrX	Klf8	245671
chr12	Klhdc2	69554
chr9	Klhl18	270201
chr8	Klhl2	77113
chr8	Klhl26	234378
chr7	Klk1b27	16619
chr7	Klk1b4	18048
chr7	Klk6	19144
chr7	Klk8	259277
chr8	Klkb1	16621
chr7	Kndc1	76484
chr16	Kng1	16644
chr16	Kng2	385643
chr17	Kntc2	67052
chr16	Kpna1	16646
chr15	Krt2-10	16679
chr15	Krt2-16	16680
chr15	Krt2-4	16682
chr10	Krtap12-1	16694
chr16	Krtap16-1	170651
chr11	Krtap3-2	66708
chr11	Krtap4-7	76444
chr11	Krtap9-1	16705
chr1_random	Lax1	240754
chr14	Lect1	16840
chr4	Lepr	16847
chr11	Lhx1	16869
chr5	Lhx5	16873
chr2	Lhx6	16874
chr5	Lias	79464
chr18	Lims2	225341
chr15	Lmbrd2	320506
chr7	Lmtk3	381983
chr19	LOC240549	240549
chr4	LOC242517	242517
chr10	LOC245263	245263
chr12	LOC245297	245297
chrY_random	LOC380994	380994
chr3	LOC381438	381438
chr6	LOC381806	381806

chrY_random	LOC382133	382133
chrX	LOC382243	382243
chr12	LOC382686	382686
chr8	LOC384806	384806
chr10	LOC432436	432436
chr12	LOC432637	432637
chr12	LOC432665	432665
chr14	LOC432825	432825
chr14	LOC432867	432867
chr2	LOC433520	433520
chr4	LOC433762	433762
chr4	LOC433801	433801
chr4	LOC433804	433804
chr7	LOC434172	434172
chr8	LOC434320	434320
chr14	LOC434459	434459
chr1	LOC434484	434484
chrY_random	LOC434960	434960
chrY_random	LOC435023	435023
chr12	LOC435337	435337
chr7	LOC435970	435970
chr8	LOC436177	436177
chr11	LOC544810	544810
chr12	LOC544881	544881
chr14	LOC544988	544988
chr14	LOC545007	545007
chr14	LOC545013	545013
chr2	LOC545471	545471
chr4	LOC545618	545618
chr5	LOC545758	545758
chr5	LOC545812	545812
chr5	LOC545814	545814
chr7	LOC545952	545952
chr7	LOC545963	545963
chr19	LOC546723	546723
chr17	LOC547343	547343
chr14	LOC554327	554327
chr1	LOC619597	619597
chr1	LOC620078	620078
chr19	LOC621954	621954
chr4	LOC622208	622208
chr16	LOC622757	622757
chr12	LOC625794	625794
chr17	LOC626854	626854
chr4	LOC627585	627585
chr3	LOC627995	627995
chr2	LOC629754	629754
chr2	LOC629756	629756
chr11	LOC629873	629873
chr17	LOC630537	630537
chr17	LOC632526	632526
chr4	LOC632957	632957

chr13	LOC633640	633640
chr4	LOC634450	634450
chr14	LOC654465	654465
chr8	LOC664858	664858
chr11	LOC665040	665040
chrX	LOC665169	665169
chr4	LOC665845	665845
chr4	LOC666526	666526
chr3	LOC667857	667857
chr7	LOC668241	668241
chr7	LOC668658	668658
chr17	Lrg1	76905
chr11	Lrrc46	69297
chr15	Lrrc6	54562
chr6	Lrrc61	243371
chr2	Lrrc8a	241296
chr5	Lrrc8d	231549
chr2	Lrsam1	227738
chr10	Lsm7	66094
chr4	Ltb4dh	67103
chr15	Ly6a	110454
chr15	Ly6k	76486
chr3	Lysmd1	217779
chr5	Maea	59003
chrX	Magea1	17137
chr13	Mak	17152
chr2	Mal	17153
chr19	Mamdc2	71738
chr11	Map3k14	53859
chr7	Mapk1ip1	69546
chr15	Mapk8ip2	60597
chr5	Mapre3	100732
chr8	March1	72925
chr18	March3	320253
chr10	March9	216438
chr10	Marcks	17118
chr18	Mbp	17196
chr11	Mbtd1	103537
chr10	Mcm3ap	54387
chr14	Mcpt2	17225
chr14	Mcpt9	17232
chr4	Med18	67219
chr8	Mela	17276
chr17	Mettl4	76781
chr4	Mfap2	17150
chr5	Mfsd7	243197
chr10	Mgat4c	67569
chrY_random	MGC107098	434935
chr4	MGC117846	626316
chrX	MGC118210	382275
chr1	MGC118608	619989
chr5	MGC58177	381714

chr4	MGC91195	381569
chr12	Mia2	338320
chr4	Mib2	76580
chr10	Mical1	171580
chrX	Mid1	17318
chr4	Mier1	71148
chr1	Mixl1	27217
chr9	Mizf	102423
chr5	Mmd2	75104
chr9	Mmp10	17384
chr9	Mmp1a	83995
chr9	Mmp1b	83996
chr2	Mmp24	17391
chr11	Mmp28	118453
chr12	Moap1	64113
chr9	Mobp	17433
chrX	Morf4l2	56397
chr17	Morn2	378462
chr15	Mpst	246221
chr1	Mpz	17528
chr7	Mrgpra1	233221
chr11	Mrpl10	107732
chr17	Mrpl14	68463
chr1	Mrpl15	27395
chr1	Mrpl30	107734
chr17	Mrpl38	60441
chr2	Mrpl41	107733
chr3	Mrpl47	74600
chr19	Mrpl49	18120
chr6	Mrpl51	66493
chr17	Mrps18b	66973
chr6	Mrps33	14548
chr17	Mrps34	79044
chr16	Mrps6	121022
chr19	Ms4a8a	64381
chr11	Msi2	76626
chr13	Msx2	17702
chr7	Mtag2	50994
chr15	Mtdh	67154
chr5	Mterf	545725
chr5	MTERF	208595
chr13	Mterfd1	66410
chr11	Mtmr3	74302
chr9	Mtnr1b	244701
chr13	Mtrr	210009
chr19	Mtvr2	17826
chr10	Mum1	68114
chr4	Mup1	17840
chr4	Mup2	17841
chrX	Mycs	17870
chr15	Myg1	60315
chr7	Myh14	71960

chr9	Myl3	17897
chr13	Mylip	218203
chr11	Myo18a	360013
chr12	Myt1l	17933
chr4	N28178	230085
chr4	Nadk	192185
chr6	Nap1l5	58243
chr15	Naprt1	223646
chr11	Nat9	66176
chr11	Nbr1	17966
chr16	Ncbp2	68092
chr1	Ncl	17975
chr16	Nde1	67203
chr11	Ndel1	83431
chr2	Ndor1	78797
chr6	Ndufa5	68202
chr15	Ndufa6	67130
chr17	Ndufa7	66416
chr6	Ndufa9	66108
chr3	Ndufb5	66046
chr15	Ndufb9	66218
chr1	Ndufs1	227197
chr4	Ndufs5	595136
chr1	Nek2	18005
chr7	Neu3	50877
chr11	Nf1	18015
chr18	Nfatc1	18018
chr2	Nfatc2	18019
chr15	Nfe2	18022
chr11	Nfe2l1	18023
chr10	Nfic	18029
chr17	Nfkbil1	18038
chr15	Nfkbil2	72749
chr3	Nhlh2	18072
chr1	Nif3l1	65102
chr5	Nifun	66383
chr8	Nip7	66164
chr1	Nit1	27045
chr14	Nkiras1	69721
chr17	Nme3	79059
chr2	Nnat	18111
chr4	Nol6	230082
chr13	Nol7	70078
chr4	Nrd1	230598
chr19	Nrxn2	18190
chr2	Nsfl1c	386649
chr11	Nsg2	18197
chr17	Nthl1	18207
chr2	Ntng2	171171
chr13	Ntrk2	18212
chr7	Nucb2	53322
chr11	Nudcd2	52653

chr11	Nudcd3	209586
chr16	Nudt1611	66911
chr11	Nufip2	68564
chr2	Nup188	227699
chr7	Obox1	71468
chr7	Obox2	246792
chr7	Obox3	246791
chr7	Obox5	252829
chr8	Odz3	23965
chr7	Odz4	23966
chr5	Ogfod2	66627
chr2	Olfr1033	258571
chr2	Olfr1062	259082
chr2	Olfr1099	258764
chr17	Olfr110	258325
chr17	Olfr112	258096
chr17	Olfr113	258286
chr2	Olfr1165	258642
chr2	Olfr1200	257887
chr2	Olfr1270	258987
chr2	Olfr1295	258398
chr2	Olfr1299	258886
chr2	Olfr1303	258397
chr2	Olfr1307	257956
chr2	Olfr1316	258737
chrX	Olfr1324	258289
chr4	Olfr1328	404333
chr4	Olfr1329	258214
chr4	Olfr1335	435804
chr4	Olfr1337	258306
chr7	Olfr1346	258918
chr10	Olfr1353	259044
chr11	Olfr1371	276865
chr11	Olfr1381	258461
chr11	Olfr1383	404337
chr11	Olfr1386	257888
chr11	Olfr1388	258459
chr11	Olfr1390	259068
chr11	Olfr1393	258463
chr19	Olfr1418	258227
chr2	Olfr142	406186
chr19	Olfr1420	258405
chr19	Olfr1472	258685
chr19	Olfr1475	258298
chr9	Olfr149	235256
chr2	Olfr1506	257665
chr2	Olfr154	27216
chr16	Olfr198	258036
chr11	Olfr20	258925
chr16	Olfr207	257973
chr16	Olfr208	258382
chr6	Olfr214	258754

chr11	Olfr223	258421
chr15	Olfr234	258502
chr11	Olfr255	258185
chr4	Olfr273	258821
chr15	Olfr284	258278
chr11	Olfr315	258531
chr11	Olfr323	258373
chr11	Olfr325	258261
chr11	Olfr328	258495
chr11	Olfr329	259148
chr11	Olfr330	258879
chr11	Olfr331	258179
chr8	Olfr370	258267
chr8	Olfr372	404315
chr8	Olfr373	258532
chr11	Olfr376	258924
chr11	Olfr380	259027
chr11	Olfr393	259010
chr11	Olfr399	259006
chr11	Olfr401	258701
chr11	Olfr402	258703
chr11	Olfr412	258153
chr13	Olfr42	18341
chr6	Olfr453	258016
chr6	Olfr459	258569
chr11	Olfr464	258407
chr7	Olfr467	257919
chr7	Olfr519	277935
chr7	Olfr547	259083
chr1_random	Olfr55	18355
chr7	Olfr553	233578
chr7	Olfr569	259092
chr7	Olfr584	259056
chr7	Olfr60	18361
chr7	Olfr617	258838
chr7	Olfr646	259058
chr7	Olfr648	258746
chr7	Olfr649	259057
chr7	Olfr655	258817
chr7	Olfr676	259099
chr7	Olfr684	244187
chr7	Olfr691	259063
chr14	Olfr720	258387
chr14	Olfr748	258113
chr19	Olfr76	258677
chr10	Olfr763	258861
chr10	Olfr784	258724
chr10	Olfr818	258773
chr10	Olfr823	258668
chr10	Olfr824	258669
chr9	Olfr850	258516
chr17	Olfr91	258470

chr9	Olf979	259112
chr10	Olig3	94222
chr10	Ormdl2	66844
chr6	Osbpl3	71720
chr14	Osgep	66246
chr16	Osta	106407
chr11	Otop3	69602
chrX	Ott	18422
chr17	Pacsin1	23969
chr5	Paics	67054
chr14	Parg	26430
chr7	Parva	57342
chr2	Pax6	18508
chr18	Pcdh1	75599
chr3	Pcdh18	73173
chr18	Pcdha4	12936
chr18	Pcdha9	192161
chr18	Pcdhac1	353236
chr18	Pcdhb1	93872
chr18	Pcdhga11	93723
chr18	Pcdhga4	93712
chr18	Pcdhga6	93714
chr18	Pcdhga8	93716
chr18	Pcdhgb2	93700
chr11	Pcgf2	22658
chr11	Pcyt2	68671
chr19	Pdcd1lg2	58205
chr19	Pdcd4	18569
chr7	Pdcd5	56330
chr9	Pdcd7	50996
chr9	Pde4a	18577
chr3	Pde4dip	83679
chr13	Pde8b	218461
chr15	Pdgfb	18591
chr18	Pdgfrb	18596
chr8	Pdlim3	53318
chr4	Pef1	67898
chr7	Peg3	18616
chr11	Per1	18626
chr1	Per2	18627
chr1	Pfdn2	18637
chr15	Pfkm	18642
chr11	Pgam2	56012
chr12	Pgf	18654
chr11	Phf12	268448
chr15	Phf5a	68479
chr18	Pias2	17344
chr10	Pias4	59004
chr16	Pik4ca	224020
chr5	Pilrb	170741
chr17	Pim1	18712
chr1	Pip5k3	18711

chr11	Pipox	19193
chr7	Pira3	18726
chr7	Pira6	18729
chr5	Piwil1	57749
chr17	Pja2	224938
chr5	Pkd2	18764
chr5	Pla2g1b	18778
chr4	Pla2g2e	26970
chr15	Pla2g6	53357
chr10	Plag1	22634
chr3	Plch1	269437
chr10	Plekhj1	78670
chr11	Plekhm1	353047
chr5	Plod3	26433
chr2	Pmpca	66865
chr14	Pnoc	18155
chr17	Pnpla1	433091
chr6	Podxl2	319655
chr11	Pold2	18972
chr18	Polr2d	69241
chr7	Polr2i	69920
chr7	Polr2l	66491
chr3	Polr3c	74414
chr2	Polr3f	70408
chr3	Polr3gl	69870
chr6	Pon1	18979
chr15	Pp11r	19011
chr15	Ppara	19013
chr5	Ppat	231327
chr1	Ppil3	70225
chr5	Ppp1cc	19047
chr17	Ppp1r10	52040
chr4	Ppp1r8	100336
chr7	Ppp2r2d	52432
chr7	Prap1	22264
chr17	Prepl	213760
chr1	Prim2	19076
chr7	Prkd2	101540
chr16	Prm1	19118
chr16	Prodh	19125
chr5	Prom1	19126
chr2	Prpf6	68879
chr11	Prr11	270906
chr17	Prr3	75210
chr6	Prrt3	210673
chr17	Prss21	57256
chr9	Psma4	26441
chr2	Psma7	26444
chr11	Psemb3	26446
chr7	Psmc13	23997
chr13	Ptch1	19206
chr13	Ptdss1	19210

chr3	Ptgr	19220
chr2	Ptpn1	19246
chr7	Ptpre	19267
chr11	Ptrh2	217057
chr7	Pvr	52118
chr10	Pwp2h	110816
chr7	Qpctl	67369
chr11	Rab11fip4	268451
chr17	Rab12	19328
chr5	Rab35	77407
chr10	Rab36	76877
chr11	Rab5c	19345
chr3	Rabggtb	19352
chr16	Rabl3	67657
chr5	Rabl5	67286
chr9	Rad54l2	81000
chr6	Raf1	110157
chr11	Rai1	19377
chr16	Ranbp1	19385
chr8	Ranbp10	74334
chr14	Rap2a	76108
chr11	Rap2ip	51799
chr7	Rasip1	69903
chr9	Rasl12	70784
chr6	Rassf8	71323
chr4	Rbm12b	72397
chr19	Rbm4	19653
chrY	Rbmy1a1	19657
chr17	Rdbp	27632
chr18	Reep2	225362
chr6	Repin1	58887
chr5	Rest	19712
chr4	Rex2	19715
chr17	Rgl2	19732
chr10	Rgs17	56533
chrX	Rhox2	75199
chrX	Rhox4a	664609
chrX	Rhox4b	57737
chrX	Rhox4e	194856
chrX	Rhox4h	636177
chr7	Ric8	101489
chr2	Rif1	51869
chr12	Rin3	217835
chr11	Rmnd5b	66089
chr17	Rnaset2	68195
chr10	Rnf126	70294
chr8	Rnf150	330812
chr8	Rnf166	68718
chr14	Rnf17	30054
chr15	Rnf19	30945
chr11	RP23-273O7.4	432552
chr4	RP23-289L21.1	433719

chr11	RP23-290B5.6	432589
chr2	Rpl12	269261
chr7	Rpl13a	22121
chr14	Rpl15	66480
chr7	Rpl18	19899
chr3	Rpl22l1	68028
chr11	Rpl23	65019
chr7	Rpl28	19943
chr10	Rpl41	67945
chr2	Rpl7a	27176
chr15	Rpl8	26961
chr5	Rpl9	20005
chr17	Rpo1-1	20016
chr17	Rps18	20084
chr10	Rps26	27370
chr17	Rps28	54127
chr4	Rragc	54170
chr16	Rrn3	106298
chr5	Rsafd1	100929
chr17	Rsnl2	78785
chr12	Rtl1	353326
chr11	Rtn4rl1	237847
chr11	Rundc1	217201
chr13	Ryr2	20191
chr2	Samd10	229011
chr11	Samd14	217125
chr5	Sart3	53890
chr5	Sbds	66711
chr5	Scarb1	20778
chr9	Scn5a	20271
chr15	Scn8a	20273
chr3	Scnm1	69269
chr11	Sco1	52892
chr15	Scrib	105782
chr2	Sdccag3	68112
chr11	Sdf2	20316
chr13	Sdha	66945
chr1	Sdhc	66052
chr6	Sec13l1	110379
chr11	Sec14l1	74136
chr16	Sec22a	317717
chr3	Sec24b	99683
chr11	Selm	114679
chr2	Sema6d	214968
chr11	Senp3	80886
chr9	Senp6	215351
chr3	Sep15	93684
chr12	Serpina5	268591
chr12	Serpina9	71907
chr13	Serpinb1c	380839
chr13	Serpinb6a	20719
chr16	Serpind1	15160

chr11	Sertad2	58172
chr11	Sez6	20370
chr10	Sf3a2	20222
chr8	Sf4	70616
chr8	Sfrs14	234373
chr11	Sfrs2	20382
chr5	Sgcb	24051
chr12	Sgpp1	81535
chr8	Siah1a	20437
chr8	Sin3b	20467
chr7	Sirt3	64384
chr10	Sirt6	50721
chr12	Six6os1	75801
chr17	Skiv2l	108077
chr15	Skp2	27401
chr3	Slc10a5	241877
chr9	Slc22a13	102570
chr8	Slc25a15	18408
chr12	Slc25a21	217593
chr2	Slc27a2	26458
chr1	Slc30a1	22782
chrX	Slc35a2	22232
chr18	Slc35a4	67843
chr16	Slc35a5	74102
chr13	Slc35d2	70484
chr18	Slc39a6	106957
chr17	Slc44a4	70129
chr5	Slc4a1ap	20534
chr5	Slc4a2	20535
chr5	Slc4a4	54403
chr11	Slc5a10	109342
chr7	Slc5a2	246787
chr11	Slc6a4	15567
chr12	Slc7a15	328059
chr8	Slc7a5	20539
chr7	Slc8a2	110891
chr12	Slc8a3	110893
chr2	Slc9a8	77031
chr11	Slfn1	20555
chr11	Slfn3	20557
chr11	Slfn4	20558
chrY_random	Sly	382301
chr1	Smap1	98366
chr1	Smarcal1	54380
chr2	Snap25	20614
chr16	Snap29	67474
chr13	Sncb	104069
chr7	Snrp70	20637
chr7	Snrpa	53607
chr7	Snrpd2	107686
chr10	Snrpd3	67332
chr7	Snx26	233071

chr2	Snx5	69178
chr19	Sorcs1	58178
chr15	Sp7	170574
chr12	Sp8	320145
chr8	Spag11	78128
chr2	Spag4	245865
chr2	Spag4l	76407
chr9	Spata19	75469
chr2	Spata5l1	214616
chr9	Spbc24	67629
chr17	Spdya	70891
chr5	Speer4a	75657
chr5	Speer4b	73526
chr5	Speer4d	360220
chr7	Sphk2	56632
chr10	Spic	20728
chr13	Spin	20729
chr5	Spink2	69982
chr19	Spnb3	20743
chr1	Spp2	75396
chr11	Spred2	114716
chr10	Spryd4	66701
chr13	Spz1	79401
chr15	Srebf2	20788
chr6	Srgap3	259302
chr11	Srp68	217337
chr9	Srpr	67398
chr9	Srprb	20818
chrY	Sry	21674
chr2	Ss18l1	269397
chr2	Ssna1	68475
chr19	Sssca1	56390
chr16	Sst	20604
chrY_random	Ssty1	20611
chrY_random	Ssty2	70009
chr3	Ssx2ip	99167
chr15	St13	70356
chr7	St5	76954
chr11	St6galnac1	20445
chr2	Stam	20844
chr18	Statip1	58523
chr16	Stfa1	20861
chr10	Stk11	20869
chr14	Stmn4	56471
chr4	Stx17	67727
chr19	Stx5a	56389
chr19	Sufu	24069
chr14	Sugt1	67955
chr9	Suhw4	235469
chr7	Sult2b1	54200
chr15	Sult4a1	29859
chr10	Sumo3	20610

chr11	Supt4h1	20922
chr11	Supt4h2	20923
chr11	Supt6h	20926
chr5	Supt7l	72195
chr2	Surf5	20933
chr19	Suv420h1	225888
chr7	Suv420h2	232811
chr17	Syngn3	20974
chr12	Sypl	19027
chr15	Syt10	54526
chr12	Syt16	238266
chr17	Sytl3	83672
chr6	Tacr1	21336
chr6	Tada3l	101206
chr17	Tap2	21355
chr17	Tapbp	21356
chr15	Tatdn1	69694
chr7	Tbc1d17	233204
chr11	Tbcd	108903
chr11	Tbkbp1	73174
chr5	Tbl2	27368
chr5	Tcf23	69852
chr4	Tcfap2e	332937
chr17	Tcp10a	21460
chr17	Tcp10b	21461
chr17	Tcp10c	21462
chr17	Tcte1	21645
chr17	Tcte3	21647
chr9	Tdgf1	21667
chr3	Tdpoz5	399676
chr19	Tdrd1	83561
chr1	Tfb2m	15278
chr4	Thap3	69876
chr11	Thoc4	21681
chr17	Thoc6	386612
chr15	Tigd5	105734
chr14	Timm23	53600
chr10	Tle6	114606
chr8	Tm2d2	69742
chr2	Tmc2	192140
chr8	Tmco3	234076
chr8	Tmed6	66269
chr11	Tmem104	320534
chr5	Tmem118	269695
chr5	Tmem119	231633
chr2	Tmem15	227697
chr10	Tmem16d	320091
chr8	Tmem38a	74166
chr16	Tmem41a	66664
chr6	Tmem43	74122
chr9	Tmem45b	235135
chr11	Tmem49	75909

chr4	Tmem54	66260
chr17	Tmem63b	224807
chr4	Tmem69	230657
chr15	Tmem74	239408
chr2	Tmem87a	211499
chr11	Tnfaip1	21927
chr7	Tnfrsf19l	320100
chr17	Tnfsf14	50930
chr3	Tnrc4	78784
chr5	Tpcn1	252972
chr10	Tph2	216343
chr11	Trappc1	245828
chr8	Trappc5	66682
chr8	Trhr2	170732
chr17	Trim26	22670
chr11	Trim47	217333
chr8	Trim60	234329
chr8	Trim61	260296
chr2	Trp53rk	76367
chr7	Trpm4	68667
chr11	Trpv2	22368
chr2	Trub2	227682
chr17	Tsc2	22084
chr8	Tsnaxip1	72236
chr6	Tspan12	269831
chr6	Tspan33	232670
chr7	Tspan4	64540
chr16	Tssk2	22115
chr15	Tst	22117
chr14	Ttc5	219022
chr19	Ttc9c	70387
chr15	Ttll1	319953
chr7	Ttyh1	57776
chr6	Tuba3	22144
chr6	Tuba7	22147
chr13	Tubb2b	73710
chr11	Tubg1	103733
chr7	Tubgcp2	74237
chr8	Tusc3	80286
chr5	Txk	22165
chr4	Txndc12	66073
chr1	Txndc9	98258
chr11	U2af1-rs1	22183
chr17	Ubash3a	328795
chr5	Ubc	22190
chr17	Ubd	24108
chr9	Ube1dc1	66663
chr7	Ube2m	22192
chr9	Ubl5	66177
chr7	Ubqln3	244178
chr16	Ufd1l	22230
chr10	Ubp1	77777

chr16	Umps	22247
chr11	Unc119	22248
chr13	Unc5a	107448
chr10	Unc5b	107449
chr7	Usp17	436004
chr9	Usp2	53376
chr2	Usp20	74270
chr7	Usp29	57775
chr6	V1ra1	22296
chr6	V1ra3	113845
chr6	V1ra4	113846
chr6	V1ra5	113847
chr6	V1ra6	113848
chr6	V1rb1	113852
chr6	V1rb3	113853
chr6	V1rb4	113854
chr6	V1rb5	107798
chr6	V1rb8	113856
chr6	V1rc10	171183
chr6	V1rc15	171188
chr7	V1rd11	404285
chr7	V1rd14	81011
chr7	V1rd15	209824
chr7	V1rd21	404290
chr7	V1rd3	81015
chr17	V1re2	171225
chr17	V1re8	171231
chr5	V1rg10	171266
chr13	V1rh12	171271
chr13	V1rh16	171274
chr13	V1ri2	171253
chr7	V2r14	22305
chr7	V2r15	22306
chr7	V2r4	22310
chr4	Vamp3	22319
chr17	Vars2	22321
chr19	Vegfb	22340
chr12	Vipr2	22355
chr5	Vkorc111	69568
chr19	Vmd2	24115
chr10	Vmd2l3	382427
chr2	Vps18	228545
chr8	Vps4a	116733
chr17	Vps52	224705
chr5	Wbscr18	66114
chr5	Wbscr22	66138
chr2	Wdr34	71820
chr13	Wdr37	207615
chr11	Wdr45l	66840
chr17	Wdr46	57315
chr11	Wdr50	217109
chr10	Wdr51b	382406

chr4	Wdr78	242584
chr2	Wfdc15	192201
chr2	Wfdc16	277345
chr2	Wfdc3	71856
chr2	Wfdc6b	433502
chr2	Wfdc8	277343
chr5	Wipi2	74781
chr15	Wnt1	22408
chr11	Wnt9b	22412
chr5	Wsb2	59043
chrX	Xlr3a	22445
chrX	Xlr3b	22446
chrX	Xmr	22526
chr9	Xtrp3s1	102680
chr7	Xylt1	233781
chr19	Yif1a	68090
chr9	Yipf2	74766
chr17	Yipf3	28064
chr17	Yipf4	67864
chr5	Ywhag	22628
chr12	Zadh1	77219
chr9	Zbtb38	245007
chr1	Zbtb41	226470
chr17	Zbtb9	474156
chr10	Zc3h10	103284
chr4	Zcchc7	319885
chr19	Zdhhc24	70605
chr5	Zfand2a	100494
chr1	Zfand2b	68818
chr7	Zfp114	232966
chr7	Zfp14	243906
chr7	Zfp146	26465
chr1	Zfp238	30928
chr8	Zfp276	57247
chr12	Zfp277	246196
chr7	Zfp324	243834
chr2	Zfp334	228876
chr7	Zfp36	22695
chr3	Zfp364	67845
chr17	Zfp414	328801
chr7	Zfp418	232854
chr8	Zfp423	94187
chr17	Zfp51	22709
chr7	Zfp511	69752
chr5	Zfp513	101023
chr17	Zfp523	224656
chr7	Zfp526	210172
chr7	Zfp566	72556
chr7	Zfp575	101544
chr16	Zfp597	71063
chr7	Zfp60	22718
chr7	Zfp629	320683

chr7	Zfp668	244219
chr5	Zfp68	24135
chr4	Zfp69	381549
chr7	Zfp84	74352
chr8	Zfp90	22751
chr17	Zfp97	22759
chr7	Zfp98	109889
chr19	Zfp11	81909
chr15	Zfr	22763
chrY	Zfy1	22767
chr2	Zhx3	320799
chr9	Zic1	22771
chr9	Zic4	22774
chr7	Zim1	22776
chr5	Znhit1	70103
chr19	Znhit2	29805
chr11	Znhit3	448850
chr17	Znrd1	66136
chr1	Zp3r	22789
chr11	Zpbp2	69376