**Supplementary figure 1:** Meta-analysis showing the expression of the candidate genes in 16 different datasets.
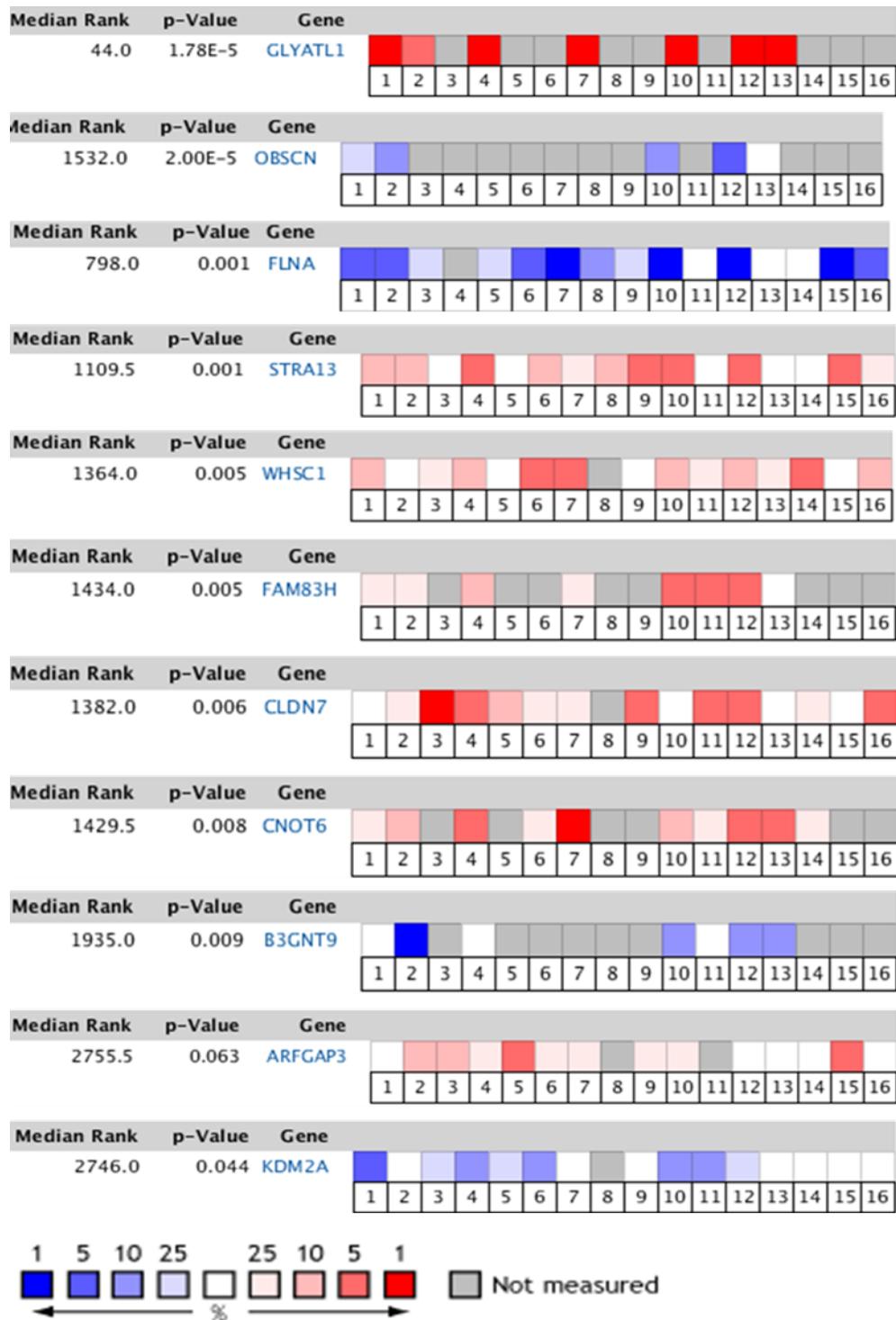
1. Prostate Carcinoma vs. Normal
   Arredouani Prostate, Clin Cancer Res, 2009

2. Prostate Carcinoma vs. Normal
   Grasso Prostate, Nature, 2012

3. Prostate Carcinoma vs. Normal
   Holzbeierlein Prostate, Am J Pathol, 2004

4. Prostate Carcinoma vs. Normal
   Lapointe Prostate, Proc Natl Acad Sci U S A, 2004

5. Prostate Carcinoma vs. Normal
   LaTulippe Prostate, Cancer Res, 2002

6. Prostate Carcinoma vs. Normal
   Liu Prostate, Cancer Res, 2006

7. Prostate Carcinoma vs. Normal
   Luo Prostate 2, Mol Carcinog, 2002

8. Prostate Carcinoma vs. Normal
   Magee Prostate, Cancer Res, 2001

9. Prostate Carcinoma vs. Normal
   Singh Prostate, Cancer Cell, 2002

10. Prostate Carcinoma vs. Normal
    Taylor Prostate 3, Cancer Cell, 2010

11. Prostate Carcinoma Epithelia vs. Normal
    Tomlins Prostate, Nat Genet, 2007

12. Prostate Adenocarcinoma vs. Normal
    Vanaja Prostate, Cancer Res, 2003

13. Prostate Carcinoma vs. Normal
    Varambally Prostate, Cancer Cell, 2005

14. Prostate Adenocarcinoma vs. Normal
    Wallace Prostate, Cancer Res, 2008

15. Prostate Carcinoma vs. Normal
    Welsh Prostate, Cancer Res, 2001

16. Prostate Carcinoma vs. Normal
    Yu Prostate, J Clin Oncol, 2004

Supplementary figure 2: Integration sites mapped on the human genome. Provirus: Chromosome junctions were identified and mapped to human genome using UCSC genome browser. Arrows (red) indicate the provirus integration sites on the chromosome.
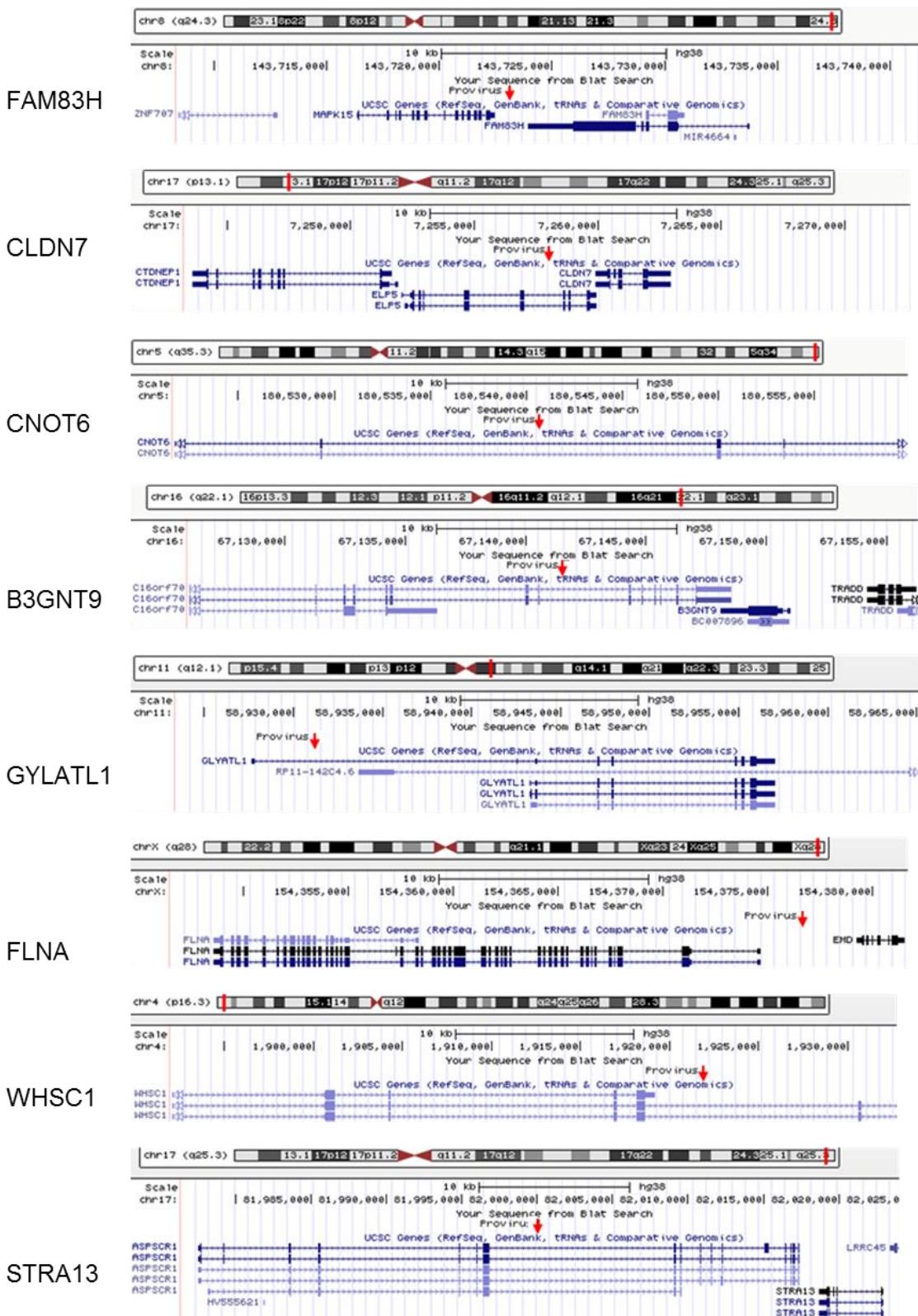
Supplementary Figure 3: Mapping of the common integration sites (CISs) on the human genome. Proviruses integrated in the same gene/locus more than one time, CISs. All integrations within the range of 100 kb were considered as CISs. Arrows (red) indicate the provirus integration sites on the chromosome. CISs on Chromosome 1 (A), 11 (B) and 22 (C) were shown.
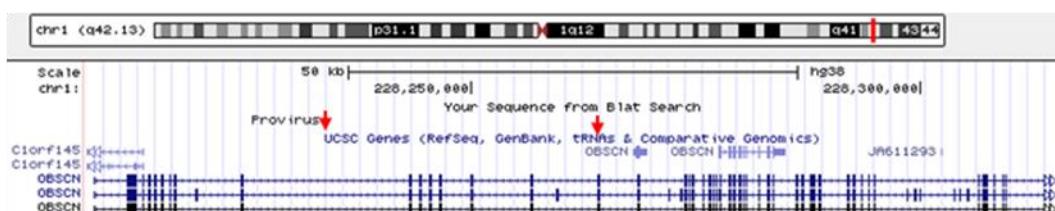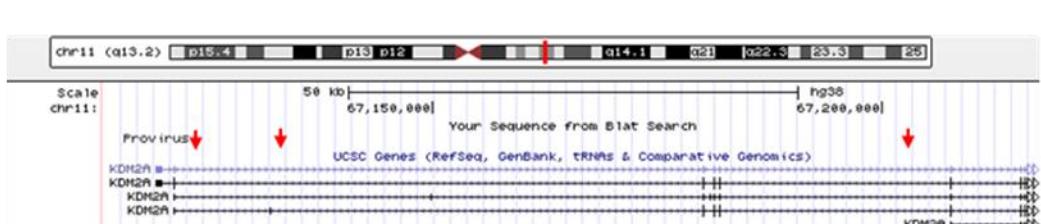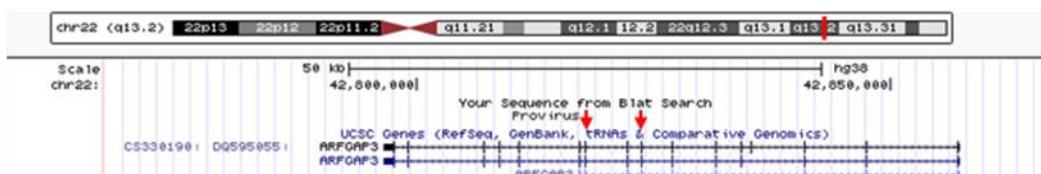
Supplementary figure 4: Genetic alterations in candidate genes in prostate cancer samples across six different datasets.
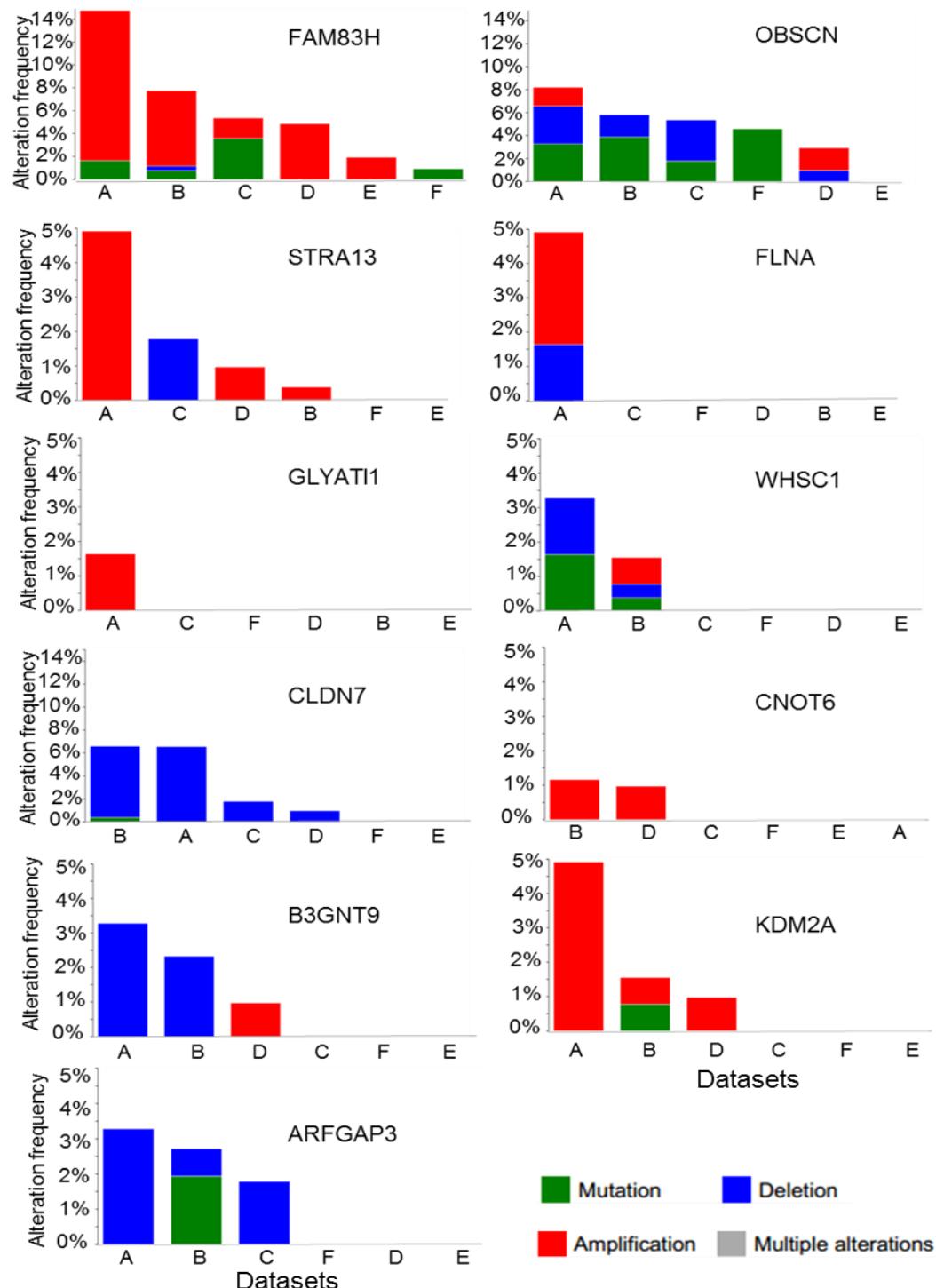

A: Grasso et al., Nature 2012; 487:239-243; **B**: TCGA, Provisional; **C**: Baca et al., Cell 2013, 153:666-677; **D**: Taylor et al., Cancer Cell 2010, 8:11-22; **E**: Hieronymus et al., PNAS 2014, 111:11139-11144; **F**: Barbieri et al., Nature Genetics 2012, 44:685-689.

Supplementary figure 5: RT-PCR analysis showing relative mRNA levels in LNCaP transduced with pTRIPZ LV shRNA vectors A) KDM2A, B) FAM83H, C) GLYATL1 D) STRA13 cultured in presence and absence of doxycycline.
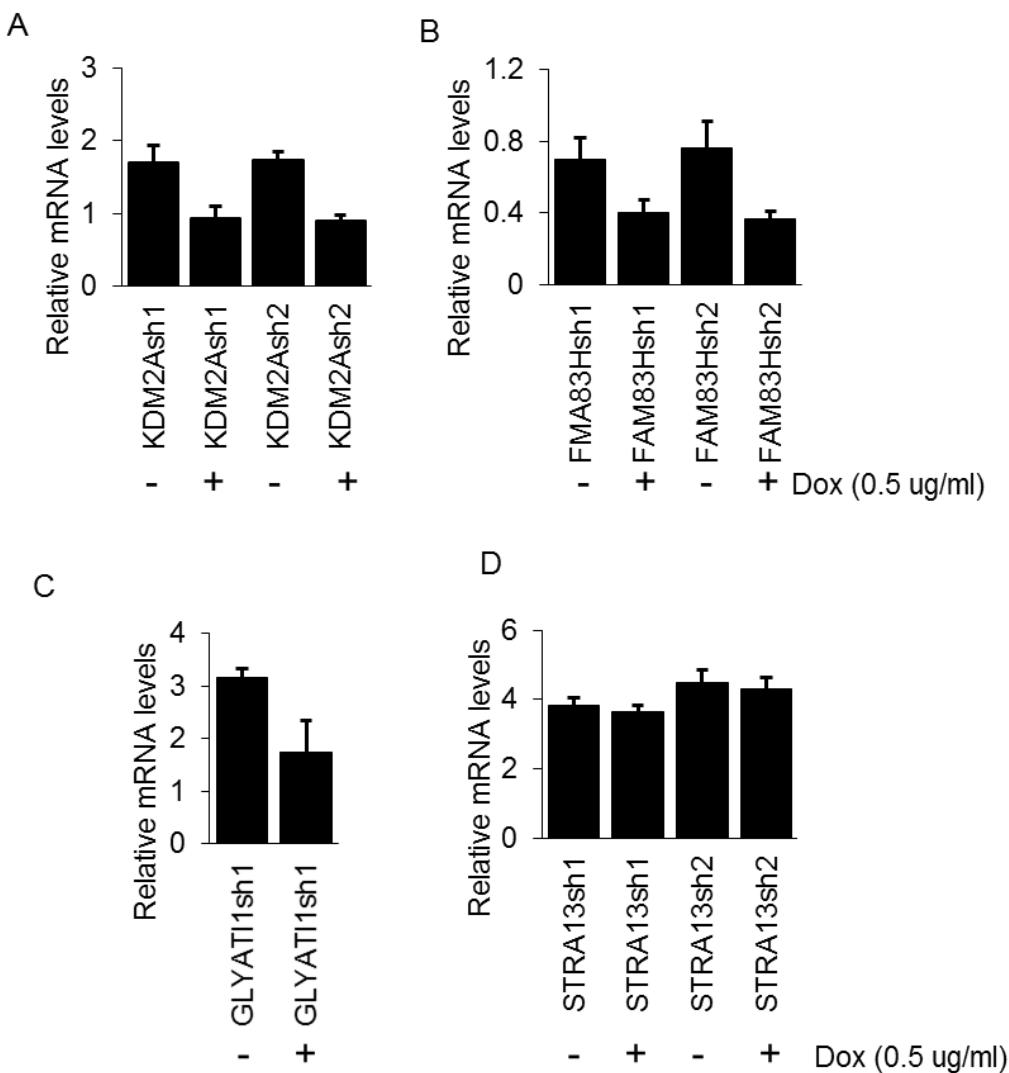
Supplementary figure 6. Kaplan-Meier curves showing the ability of the best four-gene combination to predict the recurrence risk in prostate cancer patients using cohorts from the datasets generated by Gulzar et al., (2013).

OBSCN, FAM83H, CLDN7, ARFGAP3

P=0.006281
CI=57.39
Risk Groups Hazard Ratio = 3.08
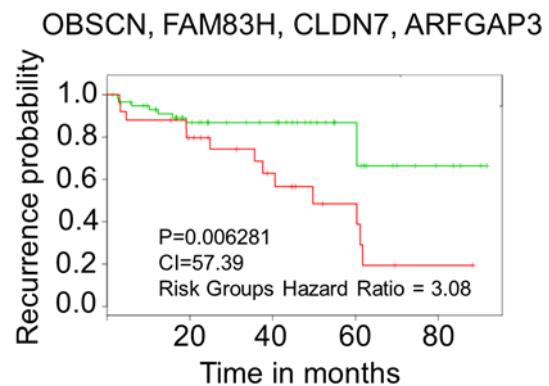
Supplementary table 1: Ability of the candidate genes (single, two-, three- and four gene combinations) to predict the recurrence risk in prostate cancer patients.

Gene combinations	p-Value	Concordance Index	Risk groups hazard ratio
OBSCN + FAM83H + CLDN7 + ARFGAP3	0.00005302	74.37	6.12
OBSCN + CLDN7 + B3GNT9 + ARFGAP3	0.00007988	75.14	5.3
WHSC1 + CLDN7 + KDM2A + ARFGAP3	0.00008705	74.51	5.24
OBSCN + CLDN7 + ARFGAP3	0.000101	74.78	5.16
OBSCN + CLDN7 + CNOT6 + ARFGAP3	0.000101	74.81	5.16
CLDN7 + ARFGAP3	0.0001031	74.05	5.16
FLNA + FAM83H + CLDN7 + CNOT6	0.0001047	74.92	4.57
CLDN7 + CNOT6 + ARFGAP3	0.0001238	74.56	5.06
FAM83H + CLDN7 + CNOT6 + ARFGAP3	0.0001238	74.43	5.06
FAM83H + CLDN7	0.00013	71.05	4.63
WHSC1 + CLDN7 + B3GNT9 +KDM2A	0.0001587	75.65	4.57
FLNA + FAM83H + CLDN7 + ARFGAP3	0.0001774	75.68	4.53
OBSCN + STRA13 + CLDN7 + KDM2A	0.000183	71.05	4.5
WHSC1 + CLDN7 + ARFGAP3	0.0001895	75.33	4.48
OBSCN + WHSC1 + CLDN7 + ARFGAP3	0.0001895	75.41	4.48
WHSC1 + CLDN7 + CNOT6 + ARFGAP3	0.0001895	75.49	4.48
STRA13 + CLDN7 + B3GNT9 +ARFGAP3	0.0002058	74.56	4.45
CLDN7 + CNOT6 + B3GNT9 + ARFGAP3	0.0002058	74.7	4.45
CLDN7 + B3GNT9 + KDM2A + ARFGAP3	0.0002111	74.65	4.44
STRA13 + CLDN7 + CNOT6 + ARFGAP3	0.0002268	74.46	4.41
FLNA + WHSC1 + CLDN7 + ARFGAP3	0.000232	75.35	4.16
CLDN7 + KDM2A	0.0002321	70.7	4.39
CLDN7 + CNOT6 + KDM2A + ARFGAP3	0.0002449	73.72	4.37
GLYATL1 + CLDN7 + B3GNT9 + KDM2A	0.0002506	78.05	4.13
CLDN7 + B3GNT9 + ARFGAP3	0.0002606	74.54	4.35
FAM83H + CLDN7 + B3GNT9 + ARFGAP3	0.0002606	74.78	4.35
FAM83H + WHSC1 + CLDN7 + ARFGAP3	0.0002688	75.03	4.33
OBSCN + STRA13 + CLDN7 + ARFGAP3	0.0002706	74.65	4.32
FAM83H + CLDN7 + ARFGAP3	0.0002901	74.1	4.3
FLNA + STRA13 + CLDN7 + ARFGAP3	0.0003083	75.35	4.04
FLNA + CLDN7 + KDM2A + ARFGAP3	0.0003083	75.52	4.04
STRA13 + WHSC1 + CLDN7 + ARFGAP3	0.0003393	75.27	3.99
FLNA + CLDN7 + B3GNT9 + ARFGAP3	0.0003457	76.61	3.84
GLYATL1 + FLNA + STRA13 + CLDN7	0.0003556	78.05	3.83
FLNA + CLDN7 + ARFGAP3	0.0003764	75.08	3.96
GLYATL1 + FLNA + CLDN7 + CNOT6	0.0003765	78.3	3.8

FLNA + WHSC1 + CLDN7 + B3GNT9	0.000383	75.76	3.78
OBSCN + FLNA + CLDN7 + ARFGAP3	0.0003918	75.76	3.94
STRA13 + FAM83H + CLDN7 + B3GNT9	0.0004035	72.14	3.92
OBSCN + FAM83H + CLDN7 + KDM2A	0.0004132	70.89	3.91
OBSCN + CLDN7 + KDM2A	0.0004348	71.02	3.89
OBSCN + CLDN7 + CNOT6 + KDM2A	0.0004575	70.89	3.87
GLYATL1 + CLDN7 + KDM2A + ARFGAP3	0.0004912	77.75	3.84
GLYATL1 + STRA13 + CLDN7 + ARFGAP3	0.0004969	78.13	3.84
WHSC1 + CLDN7 + KDM2A	0.0004976	72.09	3.83
WHSC1 + CLDN7 + CNOT6 + KDM2A	0.0004976	72.19	3.89
WHSC1 + CLDN7 + B3GNT9	0.0005185	74.89	3.83
WHSC1 + CLDN7 + CNOT6 + B3GNT9	0.0005185	74.78	3.83
FAM83H + CLDN7 + B3GNT9	0.00052	72.36	3.81
OBSCN + FLNA	0.000525	69.61	3.71
STRA13 + CLDN7 + KDM2A	0.0005255	70.7	3.81
STRA13 + WHSC1 + CLDN7 + KDM2A	0.0005546	72.39	3.79
GLYATL1 + FLNA + CLDN7 + B3GNT9	0.0005799	79.22	3.54
OBSCN + CLDN7 + CNOT6 + B3GNT9	0.0005827	72.88	3.77
FLNA + STRA13 + CLDN7 + CNOT6	0.0005839	74.1	3.63
FAM83H + CLDN7 + KDM2A	0.0005959	70.56	3.76
STRA13 + FAM83H + CLDN7 + KDM2A	0.0005959	70.64	3.76
FLNA + CLDN7 + CNOT6	0.0005991	74.07	3.61
FLNA + CLDN7 + CNOT6 + KDM2A	0.0005991	74.07	3.61
OBSCN + STRA13 + CLDN7 + B3GNT9	0.0006117	72.63	3.75
OBSCN + FLNA + CLDN7 + KDM2A	0.0006671	74.21	3.57
FLNA + WHSC1	0.0006777	69.93	3.58
OBSCN + FLNA + WHSC1	0.0006777	69.85	3.58
OBSCN + CLDN7 + B3GNT9 + KDM2A	0.0006903	72.69	3.71
OBSCN + WHSC1 + CLDN7 + B3GNT9	0.0006938	74.84	3.72
GLYATL1 + WHSC1 + CLDN7 + B3GNT9	0.0007025	79.14	3.56
FLNA + STRA13 + CLDN7 + B3GNT9	0.0007063	73.58	3.55
FLNA + CLDN7 + CNOT6 + ARFGAP3	0.0007158	75.82	3.55
CLDN7 + KDM2A + ARFGAP3	0.0007171	73.61	3.69
OBSCN + CLDN7 + KDM2A + ARFGAP3	0.0007171	73.72	3.69
OBSCN + FLNA + CLDN7	0.0007269	74.13	3.54
OBSCN + FLNA + STRA13 + CLDN7	0.0007269	74.18	3.54
OBSCN + FLNA + CLDN7 + CNOT6	0.0007269	74.46	3.54
WHSC1 + CLDN7	0.000746	71.6	3.68
WHSC1 + FAM83H + CLDN7	0.000746	71.16	3.68
GLYATL1 + FLNA + CLDN7 + KDM2A	0.000749	78.16	3.53
STRA13 + FAM83H + CLDN7	0.0007541	71	3.52

STRA13 + CLDN7 + ARFGAP3	0.0007541	74.21	3.67
STRA13 + FAM83H + CLDN7 + ARFGAP3	0.0007541	74.07	3.67
STRA13 + WHSC1 + CLDN7 + B3GNT9	0.0007576	75	3.68
OBSCN + CLDN7 + B3GNT9	0.0007678	72.77	3.66
OBSCN + FAM83H + CLDN7 + B3GNT9	0.0007678	73.15	3.66
STRA13 + CLDN7 + B3GNT9 + KDM2A	0.0007755	72.96	3.66
WHSC1 + CLDN7 + B3GNT9 + ARFGAP3	0.0008265	76.06	3.49
GLYATL1 + STRA13 + CNOT6	0.0008312	71.13	3.49
GLYATL1 + STRA13 + CNOT6 + B3GNT9	0.0008312	71.35	3.49
CLDN7 + CNOT6 + B3GNT9	0.00085	72.66	3.47
FLNA + WHSC1 + B3GNT9	0.0008809	72.09	3.41
FLNA + STRA13 + WHSC1 + B3GNT9	0.0008809	72.03	3.41
FLNA + WHSC1 + B3GNT9 + ARFGAP3	0.0008809	72.3	3.41
FAM83H + WHSC1 + CLDN7 + KDM2A	0.0008866	72.28	0.36
GLYATL1 + FLNA + FAM83H + CLDN7	0.0008873	76.69	3.39
CLDN7 + B3GNT9 + KDM2A	0.0009393	72.82	3.59
FAM83H + CLDN7 + B3GNT9 + KDM2A	0.0009393	72.74	3.59
CLDN7 + CNOT6 + B3GNT9 + KDM2A	0.0009393	72.6	3.59
GLYATL1 + WHSC1 + CLDN7 + KDM2A	0.0009606	77.12	3.43
GLYATL1 + CLDN7 + B3GNT9 +ARFGAP3	0.0009673	78.27	3.44
OBSCN + FLNA + STRA13 + KDM2A	0.001118	69.88	3.33
GLYATL1 + STRA13	0.001122	70.94	3.38
GLYATL1 + STRA13 + WHSC1 + B3GNT9	0.001125	71.38	3.37
OBSCN + FLNA + CLDN7 + B3GNT9	0.001139	75.57	3.28
FLNA + WHSC1 + CLDN7	0.001145	73.26	3.37
GLYATL1 + STRA13 + CLDN7 + B3GNT9	0.001174	76.12	3.37
GLYATL1 + FAM83H + CLDN7 + KDM2A	0.001174	76.33	3.36
OBSCN + WHSC1 + CLDN7 + KDM2A	0.00118	72.03	3.35
FAM83H + CLDN7 + CNOT6 + B3GNT9	0.00121	72.69	3.35
GLYATL1 + WHSC1 + KDM2A +ARFGAP4	0.001232	70.07	3.34
OBSCN + FLNA + STRA13	0.001234	69.64	3.28
STRA13 + CLDN7 + CNOT6	0.001276	72.11	3.33
STRA13 + WHSC1 + CNOT6 + KDM2A	0.001292	65.66	3.33
FLNA + FAM83H + WHSC1 + B3GNT9	0.001304	72.52	3.24
FLNA + CLDN7 + CNOT6 + B3GNT9	0.00131	75.19	3.22
GLYATL1 + FLNA + WHSC1 + CLDN7	0.001332	77.7	3.23
OBSCN + FLNA + FAM83H + ARFGAP3	0.001342	70.32	3.24
OBSCN + FLNA + FAM83H + CNOT6	0.001369	69.34	3.27
FLNA + CLDN7 + B3GNT9	0.001386	73.91	3.22
FLNA + FAM83H + CLDN7 + B3GNT9	0.001386	73.88	3.22
GLYATL1 + WHSC1 + CLDN7 + ARFGAP3	0.001486	77.72	3.27

GLYATL1 + FAM83H + CLDN7 + ARFGAP3	0.001519	76.99	3.27
GLYATL1 + FLNA + CLDN7	0.001524	77.7	3.18
GLYATL1 + OBSCN + FLNA + CLDN7	0.001524	77.64	3.18
FLNA + STRA13 + CNOT6	0.001535	69.25	3.2
OBSCN + FLNA + STRA13 + CNOT6	0.001535	69.58	3.2
FLNA + WHSC1 + CLDN7 + KDM2A	0.001565	73.86	3.25
OBSCN + FLNA + STRA13 + FAM83H	0.001592	69.8	3.18
OBSCN + STRA13 + FAM83H + CLDN7	0.001601	71.95	3.25
FLNA + STRA13 + WHSC1 + KDM2A	0.00161	69.91	3.18
FLNA + FAM83H + WHSC1 + CNOT6	0.001612	69.53	3.18
GLYATL1 + WHSC1 + B3GNT9 + KDM2A	0.00164	71.54	3.23
GLYATL1 + FLNA + CLDN7 + ARFGAP3	0.00167	78.81	3.14
OBSCN + FLNA + CNOT6	0.001694	69.61	3.16
FAM83H + WHSC1 + CLDN7 + B3GNT9	0.001698	75.05	3.24
GLYATL1 + STRA13 + WHSC1 + CLDN7	0.001703	76.55	3.14
OBSCN + FAM83H + WHSC1 + CLDN7	0.001728	71.38	3.22
GLYATL1 + CLDN7 + ARFGAP3	0.00174	77.26	3.22
FLNA + WHSC1 + CLDN7 + CNOT6	0.001749	74.26	3.12
STRA13 + FAM83H + WHSC1 + CLDN7	0.001765	71.68	3.21
FLNA + STRA13 + WHSC1 + CLDN7	0.001793	73.47	3.12
OBSCN + FLNA + FAM83H + CLDN7	0.001799	74.62	3.12
CLDN7 + CNOT6 + KDM2A	0.001801	70.83	3.2
STRA13 + CLDN7 + CNOT6 + KDM2A	0.001801	70.75	3.2
GLYATL1 + STRA13 + CNOT6 + ARFGAP3	0.001819	73.09	3.2
FLNA + WHSC1 + KDM2A	0.001842	69.66	3.12
OBSCN + CLDN7 + CNOT6	0.001874	71.79	3.19
OBSCN + FAM83H + CLDN7 + CNOT6	0.001874	71.8	3.19
GLYATL1 + FAM83H + WHSC1 + CLDN7	0.001895	76.14	3.1
OBSCN + FLNA + FAM83H	0.001912	69.01	3.11
STRA13 + WHSC1 + CLDN7	0.001934	72.09	3.19
OBSCN + STRA13 + WHSC1 + CLDN7	0.001934	72.52	3.19
GLYATL1 + OBSCN + CLDN7 + KDM2A	0.001983	76.39	3.17
GLYATL1 + CLDN7 + CNOT6 + KDM2A	0.001983	76.47	3.17
FLNA + CLDN7 + B3GNT9 + KDM2A	0.001997	74.89	3.08
OBSCN + FLNA + WHSC1 + KDM2A	0.002003	69.58	3.09
OBSCN + STRA13 + CLDN7	0.002011	72.03	3.17
GLYATL1 + CLDN7 + CNOT6 + B3GNT9	0.002045	76.39	3.08
GLYATL1 + CLDN7 + CNOT6 + ARFGAP3	0.002051	77.15	3.16
WHSC1 + CLDN7 + CNOT6	0.002116	72.28	3.15
OBSCN + WHSC1 + CLDN7 + CNOT6	0.002116	72.39	3.15
GLYATL1 + CLDN7 + KDM2A	0.002139	76.63	3.14

GLYATL1 + STRA13 + CLDN7 + KDM2A	0.002139	76.82	3.14
OBSCN + FLNA + FAM83H + KDM2A	0.0022	69.25	3.06
FLNA + CLDN7 + KDM2A	0.002315	73.75	3.03
FLNA + STRA13 + CLDN7 + KDM2A	0.002315	73.83	3.03
FLNA + FAM83H + CLDN7 + KDM2A	0.002315	73.64	3.03
FLNA + STRA13	0.002333	69.47	3.06
FLNA + WHSC1 + B3GNT9 + KDM2A	0.002354	71.9	3
FLNA + FAM83H + KDM2A	0.002355	68.38	3.05
FLNA + WHSC1 + CNOT6	0.00236	69.69	3.03
OBSCN + FLNA + WHSC1 + CNOT6	0.00236	69.61	3.03
STRA13 + CLDN7 + KDM2A + ARFGAP3	0.002362	73.86	3.11
OBSCN + FLNA + WHSC1 + CLDN7	0.002368	73.64	3.02
GLYATL1 + STRA13 + WHSC1 + KDM2A	0.002384	69.99	3.1
FLNA + FAM83H	0.002494	68.19	3.03
GLYATL1 + FAM83H + CLDN7 + B3GNT9	0.002507	76.06	3.01
FLNA	0.002583	68.36	3.02
FLNA + KDM2A	0.002583	68.33	3.02
FLNA + CNOT6 + B3GNT9	0.002597	70.29	3
FLNA + CNOT6 + B3GNT9 + KDM2A	0.002597	70.34	3
GLYATL1 + OBSCN + WHSC1 + CLDN7	0.002632	76.42	2.98
GLYATL1 + STRA13 + FAM83H + CNOT6	0.00289	70.97	2.95
GLYATL1 + FAM83H + WHSC1 + B3GNT9	0.002944	70.86	2.95
GLYATL1 + STRA13 + CLDN7	0.002996	75.87	2.95
OBSCN + FAM83H + CLDN7	0.003002	71.6	3.03
FLNA + STRA13 + CLDN7	0.00304	72.6	2.93
GLYATL1 + FAM83H + B3GNT9 + ARFGAP3	0.003067	68.87	2.93
FAM83H + CLDN7 + KDM2A + ARFGAP3	0.003085	73.37	3.01
FLNA + FAM83H + ARFGAP3	0.003087	69.69	2.91
FLNA + STRA13 + KDM2A	0.003129	69.5	2.94
GLYATL1 + CLDN7 + B3GNT9	0.003239	75.41	2.93
OBSCN + FLNA + KDM2A	0.003286	69.53	2.89
GLYATL1 + STRA13 + FAM83H + ARFGAP3	0.0033	71.54	2.91
GLYATL1 + OBSCN + STRA13 + ARFGAP3	0.003302	71.49	2.91
STRA13 + FAM83H + CLDN7 + CNOT6	0.003325	71.9	2.9
GLYATL1 + CNOT6 + ARFGAP3	0.003426	69.14	2.9
GLYATL1 + OBSCN + WHSC1 + KDM2A	0.003501	69.99	2.88
FLNA + WHSC1 + ARFGAP3	0.00351	70.62	2.84
GLYATL1 + OBSCN + CLDN7 + B3GNT9	0.003561	76.44	2.89
STRA13 + CLDN7 + CNOT6 + B3GNT9	0.003567	72.52	2.88
GLYATL1 + B3GNT9 + ARFGAP3	0.0036	68.79	2.88
GLYATL1 + WHSC1 + B3GNT9	0.003623	70.78	2.87

GLYATL1 + STRA13 + FAM83H	0.003748	70.75	2.86
GLYATL1 + STRA13 + B3GNT9	0.003748	71.08	2.86
GLYATL1 + STRA13 + FAM83H + B3GNT9	0.003748	70.92	2.86
FLNA + B3GNT9 + KDM2A	0.003789	70.23	2.84
FLNA + STRA13 + B3GNT9 + KDM2A	0.003789	70.26	2.84
FLNA + FAM83H + CNOT6 + ARFGAP3	0.003858	69.66	2.84
GLYATL1 + FLNA + FAM83H + CNOT6	0.003889	70.53	2.84
FLNA + STRA13 + WHSC1 + ARFGAP3	0.003947	70.56	2.81
FAM83H + CLDN7 + CNOT6	0.00395	71.7	2.85
FLNA + ARFGAP3	0.004	69.99	2.82
GLYATL1 + WHSC1 + CNOT6 + B3GNT9	0.004007	70.7	2.84
WHSC1 + CNOT6 + B3GNT9 + KDM2A	0.004007	67.51	2.84
OBSCN + FLNA + WHSC1 + ARFGAP3	0.004039	70.59	2.8
FLNA + WHSC1 + CNOT6 + B3GNT9	0.004051	71.79	2.8
GLYATL1 + OBSCN + STRA13 + B3GNT9	0.004118	70.67	2.83
FLNA + CLDN7	0.004151	72.3	2.83
GLYATL1 + FAM83H + CLDN7	0.004167	74.37	2.83
OBSCN + FLNA + ARFGAP3	0.004294	69.99	2.79
OBSCN + FLNA + CNOT6 + ARFGAP3	0.004294	69.99	2.79
FLNA + FAM83H + CNOT6 + B3GNT9	0.004329	69.91	2.81
CLDN7 + CNOT6	0.004405	71.73	2.81
FLNA + FAM83H + KDM2A + ARFGAP3	0.004462	69.69	2.77
STRA13 + WHSC1 + CLDN7 + CNOT6	0.004517	72.6	2.8
FLNA + STRA13 + FAM83H + CNOT6	0.004554	69.74	2.77
GLYATL1 + WHSC1 + CNOT6 + KDM2A	0.004635	68.57	2.79
GLYATL1 + ARFGAP3	0.004637	68.3	2.79
GLYATL1 + OBSCN + ARFGAP3	0.004637	68.55	2.79
GLYATL1 + FAM83H + ARFGAP3	0.004637	68.27	2.79
FLNA + STRA13 + KDM2A + ARFGAP3	0.004676	70.62	2.75
FLNA + STRA13 + WHSC1	0.004682	69.8	2.74
FLNA + STRA13 + WHSC1 + CNOT6	0.004682	69.83	2.74
FLNA + FAM83H + CNOT6	0.004758	68.71	2.76
FLNA + STRA13 + FAM83H + ARFGAP3	0.004777	70.18	2.75
GLYATL1 + STRA13 + ARFGAP3	0.004809	70.78	2.78
GLYATL1 + STRA13 + B3GNT9 + ARFGAP3	0.004809	70.86	2.78
GLYATL1 + OBSCN + KDM2A + ARFGAP4	0.004844	67.89	2.78
OBSCN + STRA13 + CLDN7 + CNOT6	0.004934	72	2.77
GLYATL1 + FLNA + WHSC1 + B3GNT9	0.005072	74.4	2.73
FAM83H + CLDN7 + CNOT6 + KDM2A	0.005089	70.78	2.76
OBSCN + FLNA + STRA13 + WHSC1	0.005122	69.72	2.72
GLYATL1 + WHSC1 + ARFGAP3	0.005143	69.91	2.76

FLNA + FAM83H + CNOT6 + KDM2A	0.005143	68.63	2.74
FLNA + WHSC1 + CNOT6 + KDM2A	0.005296	69.74	2.71
GLYATL1 + FLNA + STRA13 + B3GNT9	0.00532	74.02	2.72
FLNA + STRA13 + ARFGAP3	0.005331	70.67	2.71
OBSCN + FLNA + STRA13 + ARFGAP3	0.005331	70.67	2.71
GLYATL1 + OBSCN + FAM83H + ARFGAP3	0.005425	68.55	2.74
GLYATL1 + OBSCN + CLDN7 + ARFGAP3	0.005507	77.21	2.74
FLNA + STRA13 + FAM83H + WHSC1	0.005669	70.45	2.69
GLYATL1 + B3GNT9 + KDM2A	0.005809	68.11	2.72
FLNA + CNOT6	0.005816	69.01	2.69
GLYATL1 + OBSCN + B3GNT9 + KDM2A	0.005937	68.16	2.72
GLYATL1 + B3GNT9 + KDM2A + ARFGAP3	0.00597	69.13	2.71
OBSCN + FLNA + FAM83H + WHSC1	0.006015	69.09	2.66
OBSCN + WHSC1 + CLDN7	0.006231	71.7	2.7
GLYATL1 + STRA13 + FAM83H + WHSC1	0.006322	71.21	2.64
FLNA + CNOT6 + KDM2A	0.006354	68.95	2.66
GLYATL1 + OBSCN + STRA13 + CLDN7	0.006421	76.06	2.64
GLYATL1 + WHSC1 + CLDN7	0.006612	76.63	2.62
GLYATL1 + OBSCN + STRA13 + CNOT6	0.00671	70.32	2.62
OBSCN + CLDN7	0.006813	71.19	2.67
FLNA + STRA13 + FAM83H	0.007044	69.42	2.62
FLNA + STRA13 + FAM83H + KDM2A	0.007044	69.42	2.62
FLNA + B3GNT9	0.007048	69.99	2.62
FLNA + FAM83H + WHSC1 + ARFGAP3	0.007075	70.59	2.61
GLYATL1 + STRA13 + WHSC1 + CNOT6	0.007085	71.35	2.6
OBSCN + WHSC1 + KDM2A	0.007177	64.71	2.65
OBSCN + WHSC1 + CNOT6 + KDM2A	0.007589	65.36	2.63
GLYATL1 + WHSC1 + CLDN7 + CNOT6	0.007696	76.5	2.58
STRA13 + CNOT6 + ARFGAP3	0.007809	67.13	2.62
FLNA + STRA13 + B3GNT9	0.007872	69.93	2.56
FLNA + STRA13 + CNOT6 + B3GNT9	0.007872	70.32	2.56
OBSCN + FLNA + B3GNT9	0.008032	70.64	2.56
OBSCN + FLNA + STRA13 + B3GNT9	0.008032	70.72	2.56
OBSCN + FLNA + CNOT6 + B3GNT9	0.008032	70.59	2.56
OBSCN + FLNA + B3GNT9 + KDM2A	0.008032	70.75	2.56
FLNA + STRA13 + FAM83H + CLDN7	0.008161	72.77	2.56
GLYATL1 + STRA13 + FAM83H + CLDN7	0.008374	76.03	2.56
GLYATL1 + FAM83H + CLDN7 + CNOT6	0.008471	75.16	2.55
FLNA + FAM83H + CLDN7	0.008498	72.47	2.54
GLYATL1 + FLNA + STRA13	0.00852	72.36	2.52
GLYATL1 + FLNA + STRA13 + WHSC1	0.00852	72.41	2.52

GLYATL1 + FAM83H + WHSC1 + KDM2A	0.008571	69.77	2.54
GLYATL1 + CLDN7 + CNOT6	0.008593	75.3	2.54
GLYATL1 + CNOT6 + B3GNT9 + ARFGAP3	0.008642	68.79	2.55
GLYATL1 + STRA13 + WHSC1	0.008678	70.81	2.53
OBSCN + FLNA + CNOT6 + KDM2A	0.008703	69.14	2.53
GLYATL1 + FLNA + STRA13 + CNOT6	0.008814	72.19	2.51
GLYATL1 + FLNA + STRA13 + ARFGAP3	0.008814	72.39	2.51
GLYATL1 + OBSCN + STRA13 + WHSC1	0.008911	71.87	2.53
FLNA + CNOT6 + ARFGAP3	0.008929	69.91	2.53
OBSCN + STRA13 + KDM2A + ARFGAP3	0.008982	66.01	2.58
FAM83H + WHSC1 + B3GNT9 + KDM2A	0.009096	67.51	2.53
GLYATL1 + FLNA + STRA13 + FAM83H	0.009178	71.35	2.51
FLNA + WHSC1 + CNOT6 + ARFGAP3	0.009708	70.53	2.48
OBSCN + ARFGAP3	0.009716	63.37	2.55
OBSCN + STRA13 + CNOT6 + B3GNT9	0.009851	64.13	2.5
OBSCN + FAM83H + ARFGAP3	0.009929	63.53	2.54
STRA13 + FAM83H + WHSC1 + ARFGAP3	0.01006	66.45	2.49
FLNA + WHSC1 + KDM2A + ARFGAP3	0.01017	70.72	2.47
OBSCN + STRA13 + WHSC1 + CNOT6	0.01018	64.9	2.49
OBSCN + STRA13 + FAM83H + B3GNT9	0.01056	64.3	2.48
FLNA + STRA13 + FAM83H + B3GNT9	0.01062	69.83	2.47
OBSCN + FLNA + KDM2A + ARFGAP3	0.01066	70.45	2.45
GLYATL1 + FLNA + FAM83H + B3GNT9	0.01088	73.01	2.45
GLYATL1 + OBSCN + B3GNT9 + ARFGAP3	0.01114	69.14	2.46
GLYATL1 + OBSCN + FLNA + STRA13	0.01132	72.3	2.44
OBSCN + FLNA + FAM83H + B3GNT9	0.01132	70.04	2.44
GLYATL1 + FAM83H + WHSC1 + ARFGAP3	0.01152	69.88	2.45
FLNA + STRA13 + CNOT6 + ARFGAP3	0.01155	70.59	2.43
GLYATL1 + WHSC1 + B3GNT9 +ARFGAP3	0.0117	71.08	2.44
GLYATL1 + OBSCN + CNOT6 + ARFGAP3	0.01186	68.85	2.44
FLNA + STRA13 + CNOT6 + KDM2A	0.0122	69.44	2.41
FAM83H + WHSC1 + CLDN7 + CNOT6	0.01239	71.98	2.43
GLYATL1 + OBSCN + STRA13 + FAM83H	0.01245	70.37	2.42
GLYATL1 + OBSCN + B3GNT9	0.0126	67.02	2.42
GLYATL1 + OBSCN + WHSC1 + CNOT6	0.01271	68.98	2.42
GLYATL1 + FLNA + FAM83H + KDM2A	0.0129	69.83	2.39
STRA13 + CNOT6 + KDM2A + ARFGAP3	0.01293	66.09	2.42
GLYATL1 + STRA13 + FAM83H + KDM2A	0.01304	66.39	2.41
GLYATL1 + OBSCN + WHSC1 + B3GNT9	0.01323	71.35	2.4
OBSCN + STRA13 + WHSC1 + KDM2A	0.01323	64.68	2.41
FLNA + CNOT6 + KDM2A + ARFGAP3	0.01323	70.07	2.39

GLYATL1 + OBSCN + STRA13	0.01332	70.18	2.4
FLNA + KDM2A + ARFGAP3	0.0136	70.04	2.38
GLYATL1 + OBSCN + WHSC1	0.01361	69.2	2.39
GLYATL1 + WHSC1 + KDM2A	0.01362	68.95	2.39
GLYATL1 + OBSCN + CNOT6 + B3GNT9	0.01365	66.91	2.4
GLYATL1 + CNOT6 + KDM2A	0.01366	64.49	2.4
GLYATL1 + OBSCN + CNOT6 + KDM2A	0.01366	64.49	2.4
STRA13 + CLDN7 + B3GNT9	0.01397	70.67	2.39
GLYATL1 + OBSCN + KDM2A	0.0141	64.43	2.39
GLYATL1 + STRA13 + WHSC1 + ARFGAP3	0.01414	70.67	2.38
GLYATL1 + CNOT6 + B3GNT9 + KDM2A	0.01475	67.57	2.37
GLYATL1 + KDM2A + ARFGAP3	0.01502	67.54	2.37
FLNA + FAM83H + WHSC1	0.01509	69.25	2.34
FLNA + FAM83H + WHSC1 + KDM2A	0.01509	69.14	2.34
GLYATL1 + FLNA + B3GNT9 + KDM2A	0.01511	73.5	2.36
GLYATL1 + STRA13 + B3GNT9 + KDM2A	0.01534	68.71	2.36
FAM83H + WHSC1 + KDM2A + ARFGAP3	0.01573	65.93	2.35
GLYATL1 + FLNA + B3GNT9	0.01576	73.91	2.35
GLYATL1 + OBSCN + FLNA + B3GNT9	0.01586	73.18	2.35
GLYATL1 + FLNA + B3GNT9 + ARFGAP3	0.01627	73.42	2.34
STRA13 + CLDN7	0.01664	69.47	2.34
OBSCN + WHSC1 + B3GNT9 + KDM2A	0.01722	67.05	2.3
GLYATL1 + FAM83H + B3GNT9	0.01744	67.95	2.32
GLYATL1 + OBSCN + FAM83H + B3GNT9	0.01744	67.4	2.32
GLYATL1 + FLNA + FAM83H + ARFGAP3	0.01747	70.59	2.3
OBSCN + CNOT6 + B3GNT9 + KDM2A	0.01757	63.21	2.32
STRA13 + B3GNT9 + KDM2A	0.01798	63.4	2.31
GLYATL1 + FAM83H + CNOT6 + ARFGAP3	0.01802	69.83	2.31
OBSCN + STRA13 + B3GNT9 + KDM2A	0.01865	63.37	2.3
WHSC1 + CNOT6 + KDM2A	0.01933	65.09	2.29
GLYATL1 + FAM83H + B3GNT9 + KDM2A	0.01971	66.48	2.28
CLDN7 + B3GNT9	0.01988	69.01	2.28
GLYATL1 + STRA13 + KDM2A + ARFGAP3	0.02048	69.96	2.27
FAM83H + CNOT6 + B3GNT9 + KDM2A	0.02064	62.66	2.25
FLNA + FAM83H + B3GNT9	0.02072	69.42	2.26
GLYATL1 + FLNA + CNOT6 + B3GNT9	0.02132	73.39	2.23
GLYATL1 + STRA13 + CLDN7 + CNOT6	0.02179	76.03	2.23
FLNA + B3GNT9 + ARFGAP3	0.02261	71.05	2.21
OBSCN + FLNA + B3GNT9 + ARFGAP3	0.02261	71.32	2.21
GLYATL1 + FLNA + KDM2A + ARFGAP3	0.02317	71.49	2.2
FLNA + CNOT6 + B3GNT9 + ARFGAP3	0.02348	71.24	2.2

FLNA + B3GNT9 + KDM2A + ARFGAP3	0.02348	71.05	2.2
GLYATL1 + FLNA + WHSC1 + KDM2A	0.02359	71.6	2.19
STRA13 + FAM83H + KDM2A + ARFGAP3	0.02368	65.8	2.23
FLNA + FAM83H + B3GNT9 + KDM2A	0.02373	69.39	2.2
GLYATL1 + FLNA + STRA13 + KDM2A	0.02381	72.55	2.19
STRA13 + KDM2A + ARFGAP3	0.02396	65.85	2.22
OBSCN + STRA13 + B3GNT9	0.02399	64.27	2.2
OBSCN + CNOT6 + ARFGAP3	0.02409	64.16	2.22
KDM2A+ARFGAP3	0.0242	63.86	2.22
GLYATL1 + OBSCN + STRA13 + KDM2A	0.02424	67.62	2.19
GLYATL1 + CNOT6 + KDM2A + ARFGAP3	0.02495	67.18	2.18
OBSCN + KDM2A + ARFGAP3	0.02554	63.59	2.21
OBSCN + FLNA + WHSC1 + B3GNT9	0.0258	71.38	2.16
OBSCN + STRA13	0.02636	63.83	2.17
GLYATL1 + FLNA + CNOT6 + KDM2A	0.02693	71.41	2.15
STRA13 + WHSC1 + B3GNT9 + ARFGAP3	0.02709	67.67	2.16
CNOT6 + ARFGAP3	0.02717	63.34	2.19
OBSCN + STRA13 + FAM83H + CNOT6	0.02733	63.81	2.16
STRA13 + FAM83H + WHSC1 + KDM2A	0.02739	65.55	2.16
WHSC1 + B3GNT9 + KDM2A + ARFGAP3	0.0275	67.37	2.15
ARFGAP3	0.02764	63.34	2.18
STRA13 + WHSC1 + CNOT6	0.02765	65.09	2.15
GLYATL1 + FLNA	0.0278	71.54	2.14
GLYATL1 + FLNA + WHSC1	0.0278	71.62	2.14
GLYATL1 + FLNA + CNOT6	0.0278	71.19	2.14
GLYATL1 + FLNA + ARFGAP3	0.0278	71.41	2.14
GLYATL1 + FLNA + WHSC1 + ARFGAP3	0.0278	71.35	2.14
GLYATL1 + FLNA + CNOT6 + ARFGAP3	0.0278	71.27	2.14
FLNA + FAM83H + B3GNT9 + ARFGAP3	0.02795	71.38	2.14
B3GNT9 + ARFGAP3	0.02874	62.85	2.17
GLYATL1 + FLNA + KDM2A	0.02879	71.41	2.13
OBSCN + CNOT6 + B3GNT9 + ARFGAP3	0.02909	64.27	2.16
GLYATL1 + OBSCN + FAM83H + WHSC1	0.02911	69.17	2.13
GLYATL1 + OBSCN + FAM83H + CNOT6	0.02917	65.8	2.14
B3GNT9 + KDM2A	0.03016	62.85	2.13
GLYATL1 + WHSC1	0.03048	69.04	2.12
GLYATL1 + WHSC1 + CNOT6	0.03097	68.65	2.12
GLYATL1 + FAM83H + KDM2A + ARFGAP3	0.03139	66.34	2.11
WHSC1 + CNOT6 + KDM2A + ARFGAP3	0.03168	65.28	2.11
GLYATL1 + OBSCN + FLNA	0.03183	71.27	2.1
GLYATL1 + OBSCN + FLNA + CNOT6	0.03183	71.38	2.1

GLYATL1 + OBSCN + FLNA + KDM2A	0.03183	71.32	2.1
GLYATL1 + OBSCN + FLNA + ARFGAP3	0.03183	71.46	2.1
GLYATL1 + OBSCN + FAM83H	0.0326	66.04	2.1
GLYATL1 + STRA13 + CNOT6 + KDM2A	0.0331	66.75	2.1
WHSC1 + FAM83H + KDM2A	0.03356	64.38	2.09
GLYATL1 + KDM2A	0.03432	65.03	2.09
GLYATL1 + OBSCN + FLNA + WHSC1	0.03629	71.51	2.06
GLYATL1	0.03653	64.62	2.07
WHSC1 + FAM83H + ARFGAP3	0.03707	64.87	2.06
OBSCN + FAM83H + WHSC1 + KDM2A	0.03717	64.3	2.06
FAM83H + WHSC1 + CNOT6 + ARFGAP3	0.03774	64.92	2.06
OBSCN + STRA13 + CNOT6 + ARFGAP3	0.0387	67.05	2.05
GLYATL1 + FLNA + FAM83H	0.03911	69.55	2.04
GLYATL1 + B3GNT9	0.03935	66.86	2.05
STRA13 + FAM83H + B3GNT9 + KDM2A	0.03974	63.07	2.05
GLYATL1 + STRA13 + KDM2A	0.04003	67.43	2.04
OBSCN + FAM83H + WHSC1 + ARFGAP3	0.0402	64.84	2.04
GLYATL1 + OBSCN + WHSC1 + ARFGAP3	0.04023	71.43	2.04
STRA13 + WHSC1 + KDM2A	0.04041	64.24	2.04
FAM83H + WHSC1 + CNOT6 + KDM2A	0.04072	64.71	2.04
GLYATL1 + FLNA + FAM83H + WHSC1	0.04123	69.85	2.02
OBSCN + B3GNT9 + KDM2A + ARFGAP3	0.04183	65.06	2.03
FAM83H + B3GNT9 + KDM2A + ARFGAP3	0.04198	64.6	2.03
OBSCN + B3GNT9 + ARFGAP3	0.04203	63.02	2.03
OBSCN + FAM83H + B3GNT9 + ARFGAP3	0.04203	63.18	2.03
STRA13 + FAM83H + WHSC1 + CNOT6	0.0424	65.28	2.02
GLYATL1 + WHSC1 + CNOT6 + ARFGAP3	0.04324	70.64	2.02
STRA13 + CNOT6 + B3GNT9 + ARFGAP3	0.04421	67.02	2.01
GLYATL1 + FAM83H + CNOT6 + B3GNT9	0.04538	68.36	2
FLNA + FAM83H + WHSC1 + CLDN7	0.046	72.71	2.8
FAM83H + KDM2A + ARFGAP3	0.04825	62.66	1.99
OBSCN + FAM83H + KDM2A + ARFGAP3	0.04825	62.77	1.99
CNOT6 + B3GNT9 + ARFGAP3	0.05115	62.91	1.97
OBSCN + STRA13 + CNOT6	0.05257	63.51	1.95
STRA13 + B3GNT9 + KDM2A + ARFGAP3	0.05265	66.48	1.96
OBSCN + STRA13 + ARFGAP3	0.05312	66.48	1.96
FAM83H + CNOT6 + B3GNT9 + ARFGAP3	0.05353	63.78	1.96
FAM83H + B3GNT9 + ARFGAP3	0.05477	63.32	1.95
FAM83H + WHSC1 + B3GNT9 + ARFGAP3	0.05645	66.09	1.93
STRA13 + FAM83H + WHSC1	0.0569	64.6	1.93
OBSCN + STRA13 + FAM83H + WHSC1	0.0569	64.92	1.93

GLYATL1 + FLNA + WHSC1 + CNOT6	0.05696	71.19	1.92
FLNA + STRA13 + B3GNT9 + ARFGAP3	0.05783	71	1.92
WHSC1 + KDM2A	0.05887	64.3	1.93
GLYATL1 + CLDN7	0.05904	73.86	1.91
B3GNT9 + KDM2A + ARFGAP3	0.05937	65.22	1.92
GLYATL1 + OBSCN + CLDN7	0.05997	74.48	1.91
GLYATL1 + OBSCN + FAM83H + CLDN7	0.05997	74.4	1.91
CLDN7	0.0603	66.78	1.92
OBSCN + STRA13 + FAM83	0.06116	63.94	1.9
OBSCN + STRA13 + WHSC1	0.06164	64.71	1.9
WHSC1 + B3GNT9 +ARFGAP3	0.06233	66.69	1.9
WHSC1 + B3GNT9 + KDM2A	0.0645	68.22	1.88
STRA13 + WHSC1 + ARFGAP3	0.06602	66.83	1.88
STRA13 + CNOT6 + B3GNT9	0.0667	64.11	1.88
STRA13 + WHSC1 + B3GNT9 + KDM2A	0.0672	68.3	1.87
STRA13 + CNOT6 + B3GNT9 + KDM2A	0.06729	63.02	1.88
STRA13 + WHSC1 + CNOT6 + B3GNT9	0.06836	67.73	1.87
STRA13 + FAM83H + CNOT6 + B3GNT9	0.06938	63.56	1.87
WHSC1 + ARFGAP3	0.07015	65.5	1.86
FAM83H + ARFGAP3	0.07018	63.34	1.88
GLYATL1 + OBSCN	0.0712	65.09	1.86
GLYATL1 + OBSCN + CNOT6	0.0712	65.09	1.86
OBSCN + STRA13 + FAM83H + KDM2A	0.07188	61.27	1.85
STRA13 + FAM83H + CNOT6	0.07243	62.64	1.85
FAM83H + CNOT6 + ARFGAP3	0.07322	64.3	1.86
WHSC1 + KDM2A + ARFGAP3	0.07368	65.22	1.85
GLYATL1 + CNOT6 + B3GNT9	0.07619	66.53	1.84
STRA13 + WHSC1 + CNOT6 + ARFGAP3	0.0773	68.33	1.83
FAM83H + B3GNT9 + KDM2A	0.07904	62.34	1.83
KDM2A	0.08018	58.44	1.83
FAM83H + KDM2A	0.08018	58.47	1.83
WHSC1 + FAM83H + B3GNT9	0.0823	65.77	1.81
FAM83H + WHSC1 + CNOT6 + B3GNT9	0.0828	66.01	1.81
GLYATL1 + FAM83H + CNOT6 + KDM2A	0.08453	64.3	1.81
OBSCN + FAM83H + CNOT6 + ARFGAP3	0.08542	64.3	1.82
OBSCN + STRA13 + KDM2A	0.08671	61.03	1.8
OBSCN + KDM2A	0.08674	59.4	1.8
CNOT6 + B3GNT9 + KDM2A + ARFGAP3	0.08798	64.95	1.79
OBSCN + WHSC1 + KDM2A + ARFGAP3	0.08814	65.01	1.79
OBSCN + WHSC1 + CNOT6 + ARFGAP3	0.09062	64.76	1.78
GLYATL1 + FAM83H + WHSC1	0.09081	69.31	1.78

GLYATL1 + FAM83H + WHSC1 + CNOT6	0.09081	69.14	1.78
GLYATL1 + OBSCN + FLNA + FAM83H	0.09413	69.53	1.77
GLYATL1 + FAM83H + KDM2A	0.09451	64.05	1.77
STRA13 + FAM83H + ARFGAP3	0.09488	66.15	1.77
OBSCN + STRA13 + FAM83H + ARFGAP3	0.09488	66.34	1.77
STRA13 + FAM83H + B3GNT9 + ARFGAP3	0.09488	65.71	1.77
WHSC1 + B3GNT9	0.09761	66.31	1.76
WHSC1 + CNOT6 + B3GNT9	0.09816	66.07	1.76
FAM83H + CNOT6 + KDM2A + ARFGAP3	0.09845	63.4	1.76
OBSCN + FAM83H + CNOT6	0.1032	59.86	1.75
STRA13 + B3GNT9 + ARFGAP3	0.1034	65.99	1.75
OBSCN + STRA13 + B3GNT9 + ARFGAP3	0.1034	66.09	1.75
WHSC1 + CNOT6 + ARFGAP3	0.1042	64.84	1.74
OBSCN + B3GNT9 + KDM2A	0.1069	62.69	1.74
OBSCN + FAM83H + CNOT6 + B3GNT9	0.1083	62.94	1.73
STRA13 + FAM83H + CNOT6 + ARFGAP3	0.1102	66.97	1.73
OBSCN + FAM83H + KDM2A	0.1115	58.91	1.72
OBSCN + FAM83H + B3GNT9 + KDM2A	0.1148	62.58	1.72
STRA13 + ARFGAP3	0.1155	66.48	1.71
STRA13 + B3GNT9	0.1237	64.08	1.69
GLYATL1 + OBSCN + CLDN7 + CNOT6	0.1257	74.86	1.68
OBSCN + WHSC1 + B3GNT9 + ARFGAP3	0.1276	65.9	1.68
CNOT6 + B3GNT9 + KDM2A	0.1339	61.44	1.67
STRA13 + FAM83H + B3GNT9	0.1441	64	1.64
STRA13 + FAM83H + CNOT6 + KDM2A	0.1444	61.14	1.64
OBSCN + FAM83H + WHSC1 + B3GNT9	0.1482	65.55	1.63
FAM83H + CNOT6 + KDM2A	0.1496	59.12	1.63
GLYATL1 + FAM83H	0.1543	65.77	1.62
GLYATL1 + FAM83H + CNOT6	0.1543	65.55	1.62
STRA13 + CNOT6 + KDM2A	0.1559	60.73	1.62
GLYATL1 + CNOT6	0.1579	64.71	1.61
STRA13 + CNOT6	0.1592	62.99	1.61
OBSCN + WHSC1 + CNOT6 + B3GNT9	0.1616	65.52	1.61
STRA13 + FAM83H + WHSC1 + B3GNT9	0.1638	67.43	1.6
STRA13 + WHSC1 + KDM2A + ARFGAP3	0.1641	66.8	1.6
CNOT6 + KDM2A	0.1644	58.09	1.61
GLYATL1 + OBSCN + FAM83H + KDM2A	0.1758	64.08	1.58
OBSCN + STRA13 + WHSC1 + ARFGAP3	0.1787	67.21	1.58
CNOT6 + KDM2A + ARFGAP3	0.1804	63.7	1.57
OBSCN + CNOT6 + KDM2A + ARFGAP3	0.1804	63.32	1.57
STRA13 + WHSC1	0.1884	64.65	1.56

OBSCN + WHSC1 + ARFGAP3	0.1905	64.6	1.56
STRA13 + WHSC1 + B3GNT9	0.1928	66.67	1.55
WHSC1 + CNOT6 + B3GNT9 + ARFGAP3	0.1929	67.02	1.55
OBSCN + FAM83H + B3GNT9	0.1997	62.25	1.54
OBSCN + CNOT6 + KDM2A	0.2285	59.61	1.5
OBSCN + FAM83H + CNOT6 + KDM2A	0.2285	59.72	1.5
OBSCN + WHSC1 + B3GNT9	0.2763	65.5	1.44
STRA13 + KDM2A	0.2929	60.81	1.43
STRA13 + FAM83H + KDM2A	0.2929	61.03	1.43
OBSCN + STRA13 + WHSC1 + B3GNT9	0.2944	66.53	1.42
STRA13	0.3044	62.72	1.41
FAM83H	0.3193	59.86	1.4
WHSC1 + CNOT6	0.3242	62.66	1.39
OBSCN + WHSC1 + CNOT6	0.3303	62.34	1.39
OBSCN	0.3312	58.66	1.39
OBSCN + CNOT6	0.3312	58.88	1.39
OBSCN + WHSC1	0.3526	62.69	1.37
OBSCN + FAM83H	0.3557	59.64	1.36
WHSC1	0.3572	62.85	1.36
STRA13 + FAM83H	0.3612	62.45	1.36
OBSCN + B3GNT9	0.3913	61.3	1.33
OBSCN + CNOT6 + B3GNT9	0.3988	61.27	1.33
FAM83H + B3GNT9	0.4328	61.47	1.3
FAM83H + CNOT6 + B3GNT9	0.4433	61.6	1.29
OBSCN + STRA13 + CNOT6 + KDM2A	0.5296	61.41	1.23
FAM83H + CNOT6	0.5317	59.72	1.23
WHSC1 + FAM83H	0.56	61.87	1.21
OBSCN + FAM83H + WHSC1	0.56	61.79	1.21
WHSC1 + FAM83H + CNOT6	0.56	61.93	1.21
OBSCN + FAM83H + WHSC1 + CNOT6	0.56	61.76	1.21
B3GNT9	0.8225	56.35	0.93
CNOT6	0.9283	56.05	1.03
CNOT6 + B3GNT9	0.9544	58.12	0.98

Supplementary table 2: Candidate gene description and functions

Candidate gene	Description	Functions
OBSCN	Obscurin, cytoskeletal calmodulin and titin-interacting RhoGEF	Serine/threonine kinase activity and calmodulin binding
FLNA	Filamin A	Actin binding protein; Regulates cytoskeleton reorganisation by interacting with integrins, membrane receptors and signaling molecules
CLDN7	Claudin 7	Formation of tight junctions, Maintains cell polarity and signal transductions
FAM83H	Family with sequence similarity 83, Member H	Structural development and calcificiation of tooth; Keratin cytoskeleton rearangement
KDM2A	Lysine-specific Histone demethyalse2A	Epigenetic regulation and maintains hetrochrmomatin state
WHSC1	Wolf-Hirschhorn syndrome candidate1	Chromatin binding and Histone-Lysine specific methyltransferase functions
B3GNT9	UDP-GlcNAc:BetaGal Beta-1.3-N-Acetylglucosaminyltransferase	Galactosyltransferase activity Protein glycosylation
GLYATL1	Glycine N-acyltransferase like-1	N-acyltransferase activity
ARFGAP3	ADP-Ribosylation Factor GTPase-Activating protein 3	Regulates early secretory pathways of proteins
STRA13	Stimualted by Retinoic Acid 13	Interacts with Fanconi anemia (FA) nuclear complex to facilitate DNA repair
CNOT6	CCR4-NOT Transcription complex, subunit 6	RNA binding; miRNA-mediated repression, mRNA degration and transcritional regulation