



<i>FKBP11</i>	1737773	214	55	25152	7632	0	1	0	0	50	0	834736	3.57E-02	1
<i>C9orf47</i>	248480	646	4	22560	7152	0	1	0	0	50	1	928320	3.60E-02	1
<i>ATP5J</i>	534575	641	29	14448	3456	0	1	0	0	26	0	453440	3.71E-02	1
<i>AHSG</i>	508316	436	45	41392	12848	0	1	0	0	50	0	1257360	3.91E-02	1
<i>MMP16</i>	27285	939	-34	76640	20032	0	2	0	0	50	2	940944	3.96E-02	1
<i>SOCS3</i>	962609	209	27	24752	7984	0	1	0	0	50	3	1009504	4.65E-02	1
<i>FAM159B</i>	NaN	NaN	NaN	18672	4896	0	1	0	0	50	0	1786720	4.70E-02	1
<i>EXOSC5</i>	1148529	249	36	26560	8480	0	1	0	0	50	0	722816	4.74E-02	1
<i>KRTAP5-2</i>	NaN	NaN	NaN	19984	5744	0	1	0	0	50	0	1787568	4.82E-02	1
<i>OR5H2</i>	414958	885	-14	35344	10016	0	1	0	0	50	0	833280	4.84E-02	1
<i>RDM1</i>	703538	424	31	36320	9376	0	1	0	0	50	1	994336	4.93E-02	1

## MutSigCV analysis of metaplastic breast cancers with squamous metaplasia (n=9).

gene	expr	reptime	hic	N_nonsilent	N_silent	N_noncoding	n_nonsilent	n_silent	n_noncoding	nnei	x	X	p	q
<i>TP53</i>	2069567	213	34	27801	7677	0	7	0	0	50	0	466425	3.76E-09	7.09E-05
<i>PTEN</i>	259678	300	34	27252	6336	0	4	0	0	50	0	461070	2.17E-03	1
<i>RHOC</i>	559669	325	27	12636	3510	0	1	0	0	50	0	585513	2.49E-02	1
<i>SSBP1</i>	200522	844	14	10188	2556	0	1	0	0	50	0	447156	2.58E-02	1
<i>C6orf62</i>	422850	362	40	15255	3807	0	1	0	0	50	1	610056	3.12E-02	1
<i>CRH</i>	277437	480	30	11889	4176	0	1	0	0	50	1	501138	3.32E-02	1
<i>RAB26</i>	1938163	224	40	16650	5031	0	1	0	0	50	0	537408	3.96E-02	1
<i>USP5</i>	2822601	232	32	56376	15363	0	3	0	0	31	0	311337	4.72E-02	1

## MutSigCV analysis of metaplastic breast cancers with spindle metaplasia (n=10).

Gene	expr	reptime	hic	N_nonsilent	N_silent	N_noncoding	n_nonsilent	n_silent	n_noncoding	nnei	x	X	p	q
<i>TP53</i>	2069567	213	34	30890	8530	0	6	0	0	50	0	518250	5.28E-05	9.96E-01
<i>TUBA1B</i>	2141275	214	56	31830	9210	0	2	0	0	50	0	657680	8.54E-03	1
<i>PIK3CA</i>	401889	613	11	78940	19670	0	6	0	0	50	1	613340	1.21E-02	1
<i>TSHB</i>	605838	601	1	10110	2670	0	2	0	0	50	0	698090	1.53E-02	1
<i>GPX2</i>	521616	387	35	13530	3840	0	1	0	0	50	0	593990	2.61E-02	1
<i>KRTAP15-1</i>	14979	1035	-68	9740	2740	0	2	0	0	50	0	397990	2.67E-02	1
<i>ZNF740</i>	1729009	191	55	14500	3560	0	1	0	0	50	0	513560	3.31E-02	1
<i>TSR2</i>	296262	NaN	5	14060	3760	0	1	0	0	50	0	483040	3.39E-02	1
<i>MRPL17</i>	424776	548	8	12290	3790	0	1	0	0	50	2	555890	3.47E-02	1
<i>APOOL</i>	83775	NaN	-12	19820	5410	0	1	0	0	50	1	659740	3.88E-02	1
<i>OR52K2</i>	264090	862	-7	21550	6920	0	2	0	0	50	1	650610	4.38E-02	1
<i>C1QTNF1</i>	592461	285	15	20230	5510	0	1	0	0	50	0	567310	4.48E-02	1
<i>OR13C5</i>	147494	920	-31	22170	6480	0	2	0	0	50	0	562280	4.48E-02	1
<i>OR10S1</i>	107524	830	-5	22620	7260	0	1	0	0	50	0	552130	4.96E-02	1

## Significantly mutated genes analysis of metaplastic breast cancers (n=35) using MutSigCV and the algorithm proposed by Youn and Simon.

	Metaplastic breast cancers (n=35)		Chondroid MBCs (n=16)		Spindle MBCs (n=10)		Squamous MBCs (n=9)	
	p-value	adjusted p-value*	p-value	adjusted p-value*	p-value	adjusted p-value*	p-value	adjusted p-value*
<i>TP53</i>	0	0	0	0	0	0	0	0
<i>PIK3CA</i>	0	0	NS	NS	0	0	0	0
<i>PTEN</i>	0	0	NS	NS	NS	NS	0	0
<i>PIK3R1</i>	0	0	NS	NS	NS	NS	NS	NS
<i>CHERP</i>	NS	NS	0.0000	0.0000	NS	NS	NS	NS
<i>CD84</i>	NS	NS	0.0001	0.0161	NS	NS	NS	NS
<i>USP5</i>	NS	NS	NS	NS	NS	NS	0.0001	0.0060

MBC, metaplastic breast cancer; NS, not significant. \*, correction for multiple testing by the Benjamini and Hochberg method.