

## **SUPPLEMENTARY MATERIALS**

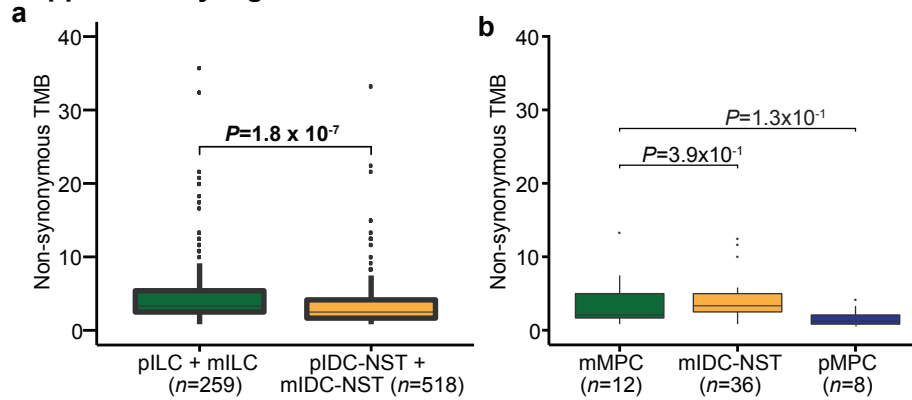
**The genomic landscape of metastatic histologic special types of invasive breast cancer**

**Pareja et al.**

**Supplementary Figures 1-7**

**Supplementary Tables 1-6**

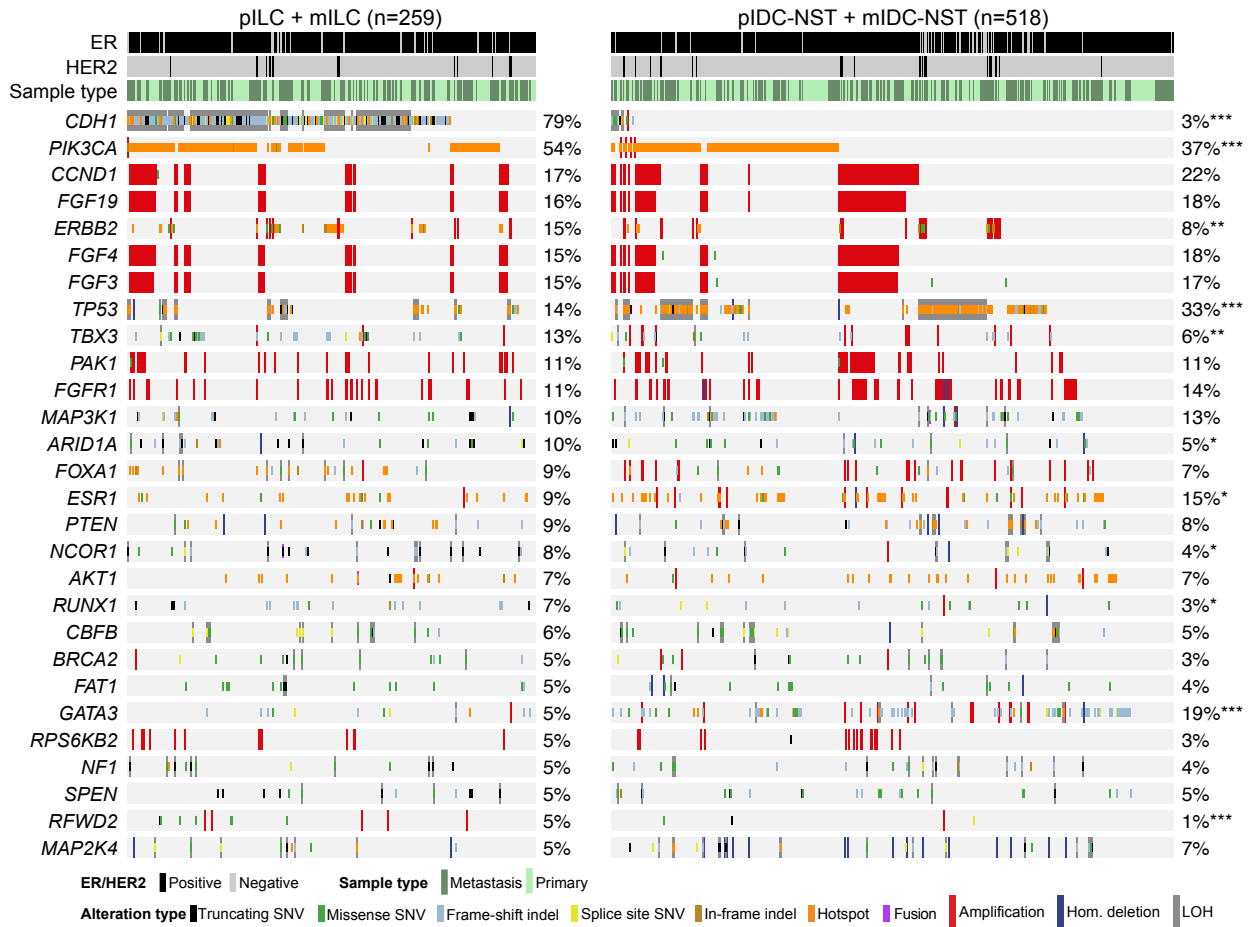
**Supplementary Figure 1**



**Supplementary Figure 1. Non-synonymous tumor mutation burden in primary and metastatic breast cancers of special histologic subtypes**

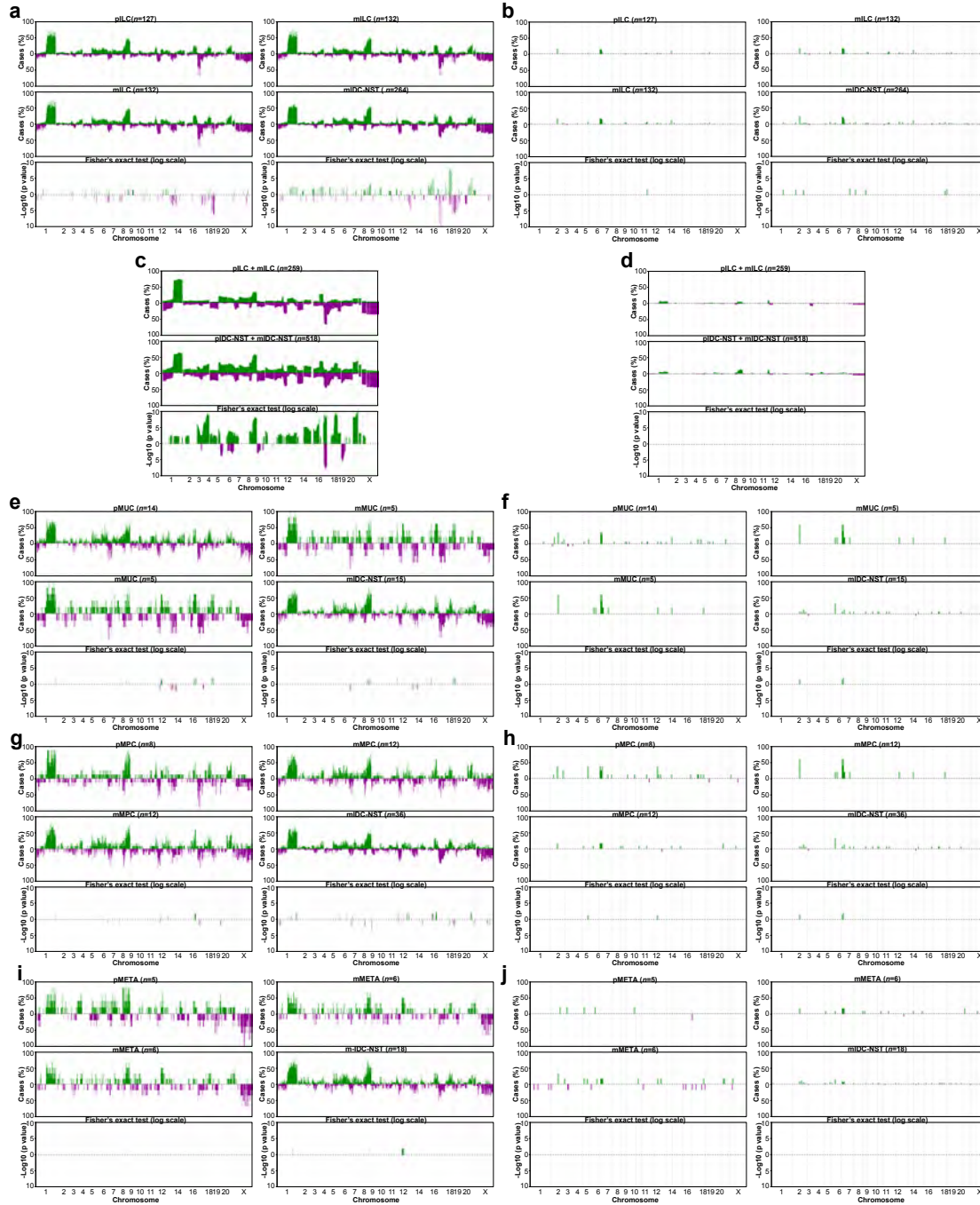
(a-b) Boxplots depicting (a) the non-synonymous tumor mutation burden (TMB) in combined primary and metastatic invasive lobular carcinomas (pILC + mILC, n=259), compared to combined primary and metastatic invasive ductal carcinomas of no special type matched by age, menopausal status, estrogen receptor (ER)/HER2 status and sample type (pIDC-NST + mIDC-NST; n=518) and (e) the non-synonymous TMB metastatic micropapillary carcinomas (mMPC, n=12), metastatic IDC-NSTs matched by clinicopathologic features (mIDC-NST; n=36) and primary micropapillary carcinomas (pMPC; n=8). Mann-Whitney *U* test, two-sided

## Supplementary Figure 2



**Supplementary Figure 2. Repertoire of somatic genetic alterations affecting key cancer genes in combined primary and metastatic invasive lobular carcinomas and in matched combined primary and metastatic invasive ductal carcinomas of no special type.** Comparison of the key cancer genes most frequently affected by non-synonymous somatic mutations, amplifications or homozygous deletions in combined primary and metastatic invasive lobular carcinomas (pILC + mILC; n=259), and in metastatic invasive ductal carcinomas of no special type matched by clinicopathologic characteristics ad sample type (pIDC-NST + mIDC-NST; n=518). Cases are shown in columns and genes in rows. Mutation types are color-coded according to the legend. ER/HER2 status are shown in the respective phenobars (top). \*,  $P < 0.05$ , \*\*,  $P < 0.01$ , \*\*\*,  $P < 0.001$ ; Fisher's exact test, two-tailed.

### Supplementary Figure 3

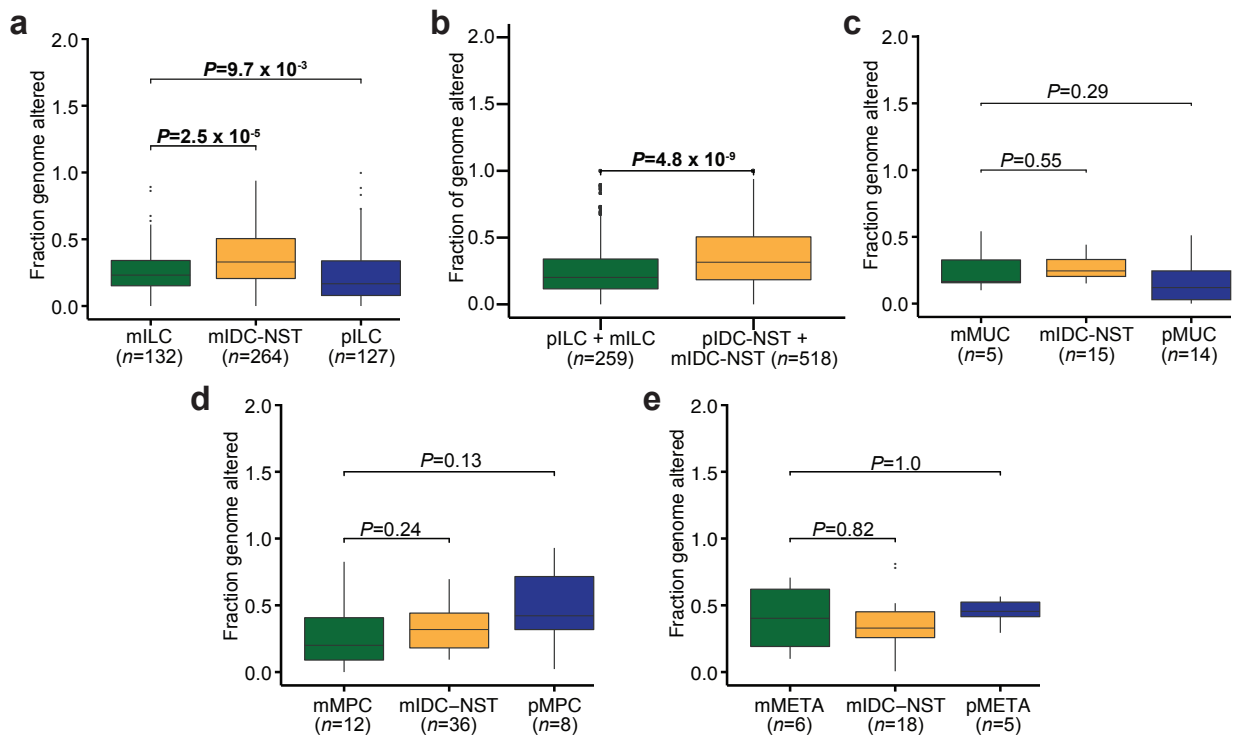


### Supplementary Figure 3. Frequency of copy number alterations in primary and metastatic special histologic subtypes of breast cancer.

Frequency plots and Fisher's exact test comparisons corrected for multiple testing of copy number (a) gains and losses and (b) amplifications and homozygous deletions between metastatic lobular

carcinomas (mILC; n=132) compared to primary invasive lobular carcinomas (pILC; n=127; left), and to metastatic invasive ductal carcinomas of no special type (mIDC-NST) matched by age, menopausal status and estrogen receptor (ER)/HER2 status (n=264; right). **(c)** Gains and losses and **(d)** amplifications and homozygous deletions in combined primary and metastatic lobular carcinomas (pILC + mILC; n=259) and primary and metastatic IDC-NSTs matched by clinicopathologic characteristics and sample type (pIDC-NST + mIDC-NST; n=518). **(e)** Gains and losses and **(f)** amplifications and homozygous deletions between metastatic mixed mucinous breast cancers (mMUC; n=5) compared to primary mixed mucinous breast cancers (pMUC; n=14, left), and to metastatic IDC-NSTs matched by clinicopathologic characteristics (mIDC-NST; n=15, right). **(g)** Gains and losses and **(h)** amplifications and homozygous deletions of metastatic micropapillary breast cancers (mMPC; n=12) compared to primary micropapillary breast cancers (pMPC; n=8, left), and to metastatic IDC-NST matched by clinicopathologic features (mIDC-NST; n=36, right). **(i)** Gains and losses and **(j)** amplifications and homozygous deletions of metastatic metaplastic BCs (mMETA; n=6) compared to primary metaplastic BCs (pMETA; n=5, left), and to metastatic IDC-NST matched by clinicopathologic characteristics (mIDC-NST; n=18, right). Frequency of gains/amplifications (green) or losses/homozygous deletions (purple) is shown for each gene (y-axis), according to genomic position (x-axis). Inverse Log<sub>10</sub> values of the two-sided Fisher's exact test *P*-values are plotted according to genomic location (lower panels).

## Supplementary Figure 4



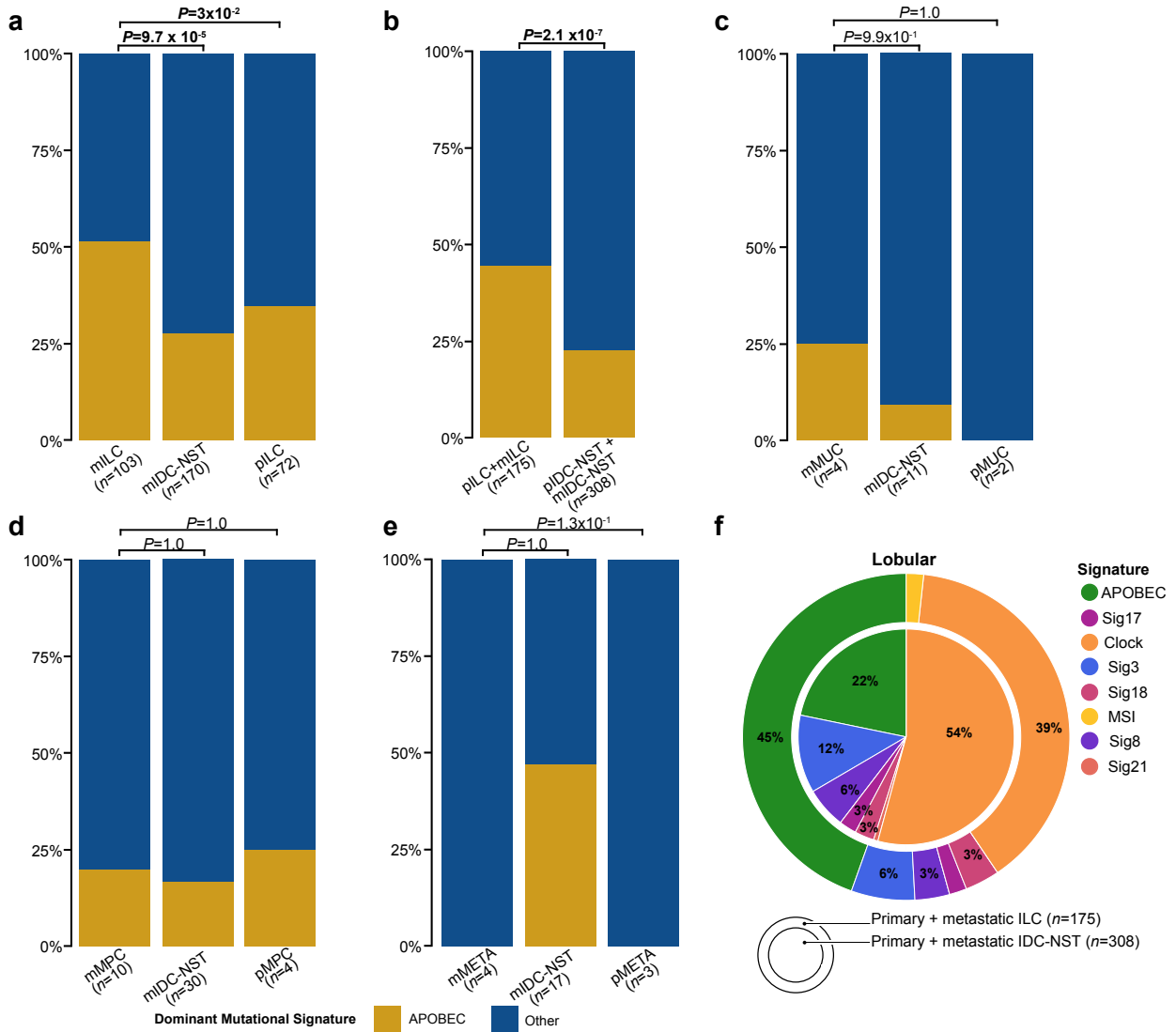
### Supplementary Figure 4. Fraction of genome altered in primary and metastatic special histologic subtypes of breast cancer.

Boxplots depicting the fraction of genome altered (FGA) of (a) metastatic lobular carcinomas (mILC; n=132), metastatic invasive ductal carcinomas of no special type matched by clinicopathologic characteristics (mIDC-NST; n=264) and primary invasive lobular carcinomas (pILC; n=127), (b) combined primary and metastatic lobular carcinomas (pILC + mILC; n=259), with age-, menopausal status-, ER/HER2 status- and sample type-matched combined primary and metastatic IDC-NSTs (pIDC-NST + mIDC-NST; n=518), (c) metastatic mixed mucinous breast cancers (mMUC; n=5), mIDC-NSTs matched by clinicopathologic features (n=15) and primary mixed mucinous carcinomas (pMUC; n=14), (d) metastatic micropapillary breast cancers (mMPC; n=12), mIDC-NST matched by clinicopathologic characteristics (n=36) and primary micropapillary breast cancers (pMPC; n=8), and (e) metastatic metaplastic breast cancers (mMETAs; n=6), mIDC-NSTs matched by clinicopathologic features (n=18) and primary

metaplastic breast cancers (pMETA; n=5). Statistically significant  $P$  values ( $P<0.05$ ) are bolded.

Mann-Whitney  $U$  test, two-sided.

### Supplementary Figure 5

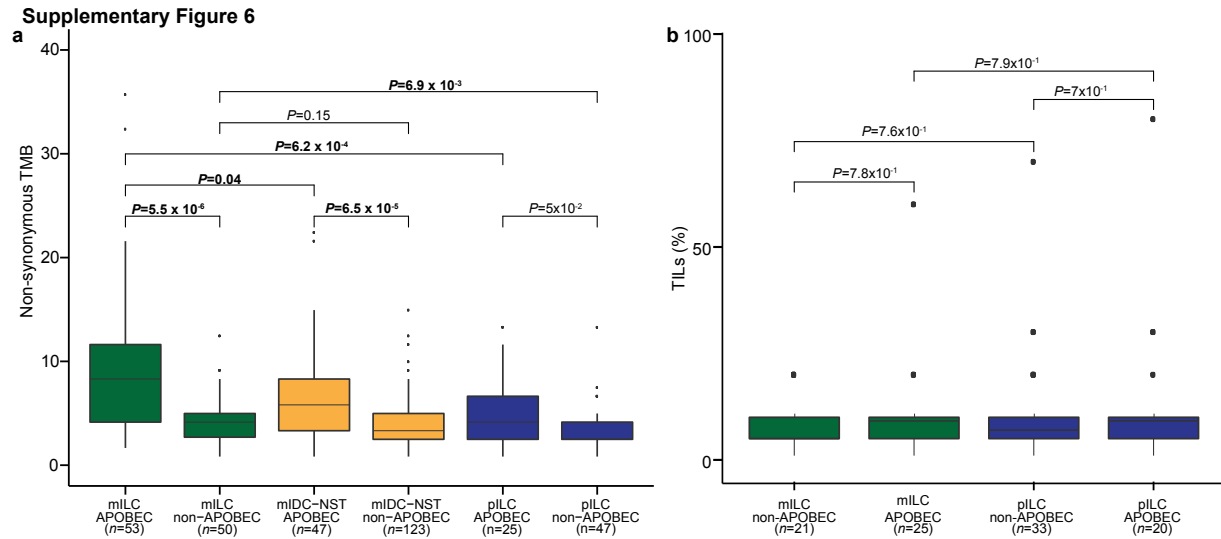


**Supplementary Figure 5. Proportion of primary and metastatic breast cancers of special histologic types with a dominant APOBEC mutational signature, and mutational signatures in primary and metastatic lobular carcinomas.**

Stacked bar plots displaying the proportion of cases with a dominant APOBEC mutational signature in (a) metastatic invasive lobular carcinomas (mILC; n=103), metastatic invasive ductal carcinomas of no special type matched by age, menopausal status and estrogen receptor (ER)/HER2 status (mIDC-NST; n=170), and primary invasive lobular carcinomas (pILC; n=72), (b) in combined primary and metastatic lobular carcinomas (pILC + mILC; n=175) and primary and metastatic invasive ductal carcinomas of no special type matched by clinicopathologic



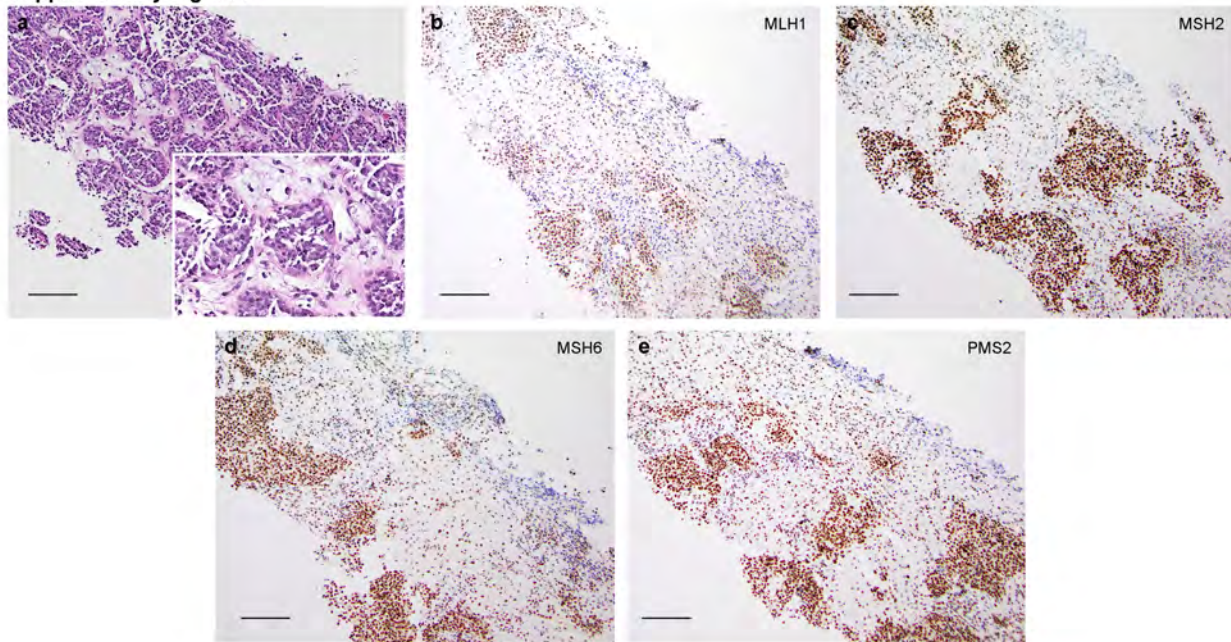
characteristics and sample type (pIDC-NST + mIDC-NST; n=308), (c) in metastatic mixed mucinous breast cancers (mMUC; n=4), mIDC-NSTs matched by clinicopathologic features (n=11) and primary mixed mucinous breast cancers (pMUC; n=2), (d) in metastatic micropapillary breast cancers (mMPC; n=10), mIDC-NSTs matched by clinicopathologic characteristics (n=30) and primary micropapillary breast cancers (pMPC; n=4), and in (e) metastatic metaplastic breast cancers (mMETA; n=4), mIDC-NSTs matched by clinicopathologic features (n=17) and primary metaplastic breast cancers (pMETA; n=3). Two-tailed fisher's exact test was performed. (f) Proportion of dominant mutational signatures in pILC + mILC (n=175) and pIDC-NST + mIDC-NST (n=308).



**Supplementary Figure 6. Non-synonymous tumor mutation burden and extent of tumor infiltrating lymphocytes in primary and metastatic lobular carcinomas in relation to a dominant APOBEC mutagenesis signature.**

(a) Boxplots depicting the non-synonymous tumor mutation burden (TMB) in metastatic lobular carcinomas (mILC) displaying a dominant APOBEC (n=53) or a non-APOBEC dominant mutational signature (n=50), age-, menopausal status- and estrogen receptor (ER)/HER2 status-matched metastatic invasive ductal carcinomas of no special type (mIDC-NSTs) with a dominant APOBEC (n=47) or a non-APOBEC mutational signature (n=123) and primary invasive lobular carcinomas (pILC) with a dominant APOBEC (n=25) and a non-APOBEC dominant signature (n=47). (b) Boxplots depicting the extent of infiltration by tumor infiltrating lymphocytes (TILs) in mILCs with a dominant mutational signature other than APOBEC (n=21), mILCs with a dominant APOBEC mutational signature (n=25), pILCs with a dominant mutational signature other than APOBEC (n=33) and pILCs with a dominant APOBEC mutational signature (n=20). Statistically significant  $P$  values ( $P < 0.05$ ) are bolded. Mann-Whitney  $U$  test, two-sided.

**Supplementary Figure 7**



**Supplementary Fig 7: Expression of mismatch repair proteins in a metastatic mixed mucinous carcinoma.** Representative (A) hematoxylin and eosin micrographs, and (B) MLH1, (C) MSH2, (D) MSH6 and (E) PMS2 expression assessed by immunohistochemistry in case MSK-MUC-4. Scale bars, 100  $\mu$ m

**Supplementary Table 1. Estrogen receptor and HER2 status of the breast cancers of special histologic subtype included in this study**

Estrogen receptor (ER)/ HER2 status	Invasive lobular carcinoma			Mixed mucinous breast cancer			Micropapillary breast cancer			Metaplastic breast cancer		
	Primary (n=127)	Metastasis (n=132)	Fisher's exact test <i>P</i> value	Primary (n=14)	Metastasis (n=5)	Fisher's exact test <i>P</i> value	Primary (n=8)	Metastasis (n=12)	Fisher's exact test <i>P</i> value	Primary (n=5)	Metastasis (n=6)	Fisher's exact test <i>P</i> value
ER+/HER2-	121 (95.3%)	107 (81.1%)	0.0016	11 (57.9%)	5 (100%)	0.53	5 (62.5%)	9 (75%)	0.339	1 (20%)	1 (16.7%)	1
ER+/HER2+	3 (2.4%)	6 (4.5%)		3 (15.8%)	0 (0%)		2 (25%)	1 (8.3%)		0 (0%)	0 (0%)	
ER-/HER2-	3 (2.4%)	16 (12.1%)		0 (0%)	0 (0%)		0 (0%)	2 (16.7%)		4 (80%)	5 (83.3%)	
ER-/HER2+	0 (0%)	3 (2.3%)		0 (0%)	0 (0%)		1 (12.5%)	0 (0%)		0 (0%)	0 (0%)	

**Supplementary Table 2. Clinicopathologic characteristics of the 309 breast cancers of histologic special type in this study and sequencing platform used**

Sample ID	Age at diagnosis	Histology	Sample type	Estrogen receptor (ER)/HER2 status	MSK-IMPACT Version
MSK-ILC-1	52	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-2	79	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-3	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-4	38	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-5	58	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-6	46	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-7	62	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-8	45	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-9	51	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-341
MSK-ILC-10	38	Invasive Lobular Carcinoma	Metastasis	ER+/HER2+	MSK-IMPACT-410
MSK-ILC-11	38	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-12	65	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-13	66	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-14	47	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-15	63	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-16	59	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-17	42	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-18	47	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-19	31	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-20	60	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-21	66	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-22	43	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-468
MSK-ILC-23	64	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-24	46	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-25	58	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-26	55	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-27	34	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-28	47	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-29	76	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-30	66	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-31	78	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-32	52	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-33	69	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-34	50	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-35	66	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-36	76	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-37	36	Invasive Lobular Carcinoma	Metastasis	ER-/HER2+	MSK-IMPACT-341
MSK-ILC-38	72	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-39	42	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-341
MSK-ILC-40	55	Invasive Lobular Carcinoma	Metastasis	ER+/HER2+	MSK-IMPACT-410
MSK-ILC-41	46	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-42	60	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-43	60	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-44	53	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-45	57	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-46	52	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-47	55	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-48	47	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-49	60	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-50	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-51	41	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-52	60	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-53	41	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-54	76	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-55	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410

MSK-ILC-56	62	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-57	53	Invasive Lobular Carcinoma	Metastasis	ER-/HER2+	MSK-IMPACT-410
MSK-ILC-58	54	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-59	44	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-60	76	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-61	67	Invasive Lobular Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-468
MSK-ILC-62	47	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-63	53	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-64	58	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-65	46	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-66	56	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-67	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-68	71	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-69	71	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-70	60	Invasive Lobular Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-410
MSK-ILC-71	42	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-72	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-73	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-74	51	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-75	62	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-76	43	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-77	66	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-78	57	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-79	42	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-80	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-81	43	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-82	66	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-83	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-84	55	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-85	58	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-86	48	Invasive Lobular Carcinoma	Metastasis	ER-/HER2+	MSK-IMPACT-341
MSK-ILC-87	51	Invasive Lobular Carcinoma	Metastasis	ER+/HER2+	MSK-IMPACT-341
MSK-ILC-88	45	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-89	62	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-90	48	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-91	40	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-92	61	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-93	55	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-94	55	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-95	48	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-96	48	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-97	46	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-98	52	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-99	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-100	54	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-101	58	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-102	56	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-103	44	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-104	63	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-105	73	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-106	35	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-107	47	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-108	39	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-109	29	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-110	69	Invasive Lobular Carcinoma	Metastasis	ER+/HER2+	MSK-IMPACT-410
MSK-ILC-111	45	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-112	56	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-113	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-114	44	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-115	49	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341

MSK-ILC-116	53	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-117	73	Invasive Lobular Carcinoma	Metastasis	ER+/HER2+	MSK-IMPACT-410
MSK-ILC-118	73	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-119	43	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-120	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-121	55	Invasive Lobular Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-341
MSK-ILC-122	63	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-123	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-124	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-125	47	Invasive Lobular Carcinoma	Metastasis	ER+/HER2+	MSK-IMPACT-341
MSK-ILC-126	38	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-127	65	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-128	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-129	49	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-130	58	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-131	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-132	50	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-133	48	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-134	41	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-135	58	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-136	58	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-137	46	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-138	56	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-139	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-140	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-141	45	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-ILC-142	67	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-143	50	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-144	65	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-145	62	Invasive Lobular Carcinoma	Primary	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-146	41	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-147	40	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-148	71	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-149	60	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-150	39	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-151	58	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-152	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-153	71	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-154	49	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-155	50	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-156	56	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-157	57	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-158	50	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-159	43	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-160	63	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-161	45	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-162	49	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-163	67	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-164	48	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-165	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-166	55	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-167	79	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-168	79	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-169	56	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-170	58	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-171	54	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-172	47	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-173	50	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-174	44	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-175	39	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468

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MSK-ILC-176	64	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-177	54	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-178	47	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-179	45	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-180	65	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-181	39	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-182	66	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-183	68	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-184	57	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-185	51	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-186	71	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-187	55	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-188	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-189	77	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-190	73	Invasive Lobular Carcinoma	Primary	ER-/HER2-	MSK-IMPACT-410
MSK-ILC-191	51	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-192	41	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-193	38	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-194	74	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-195	57	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-196	52	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-197	78	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-198	57	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-199	64	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-200	60	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-201	72	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-202	51	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-203	78	Invasive Lobular Carcinoma	Primary	ER-/HER2-	MSK-IMPACT-468
MSK-ILC-204	45	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-205	49	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-206	59	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-207	55	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-208	57	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-209	52	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-210	45	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-211	54	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-212	46	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-213	72	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-214	41	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-215	48	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-216	35	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-217	58	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-218	47	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-219	49	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-220	76	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-ILC-221	70	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-222	41	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-223	62	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-224	48	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-225	55	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-226	36	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-227	62	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-228	63	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-229	71	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-230	49	Invasive Lobular Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-468
MSK-ILC-231	65	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-232	59	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-233	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-234	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-235	47	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468



MSK-ILC-236	49	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-237	71	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-238	72	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-239	54	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-240	38	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-241	48	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-242	69	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-243	64	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-244	49	Invasive Lobular Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-245	74	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-246	67	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-247	58	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-248	63	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-249	49	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-250	49	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-251	57	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-252	51	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-253	53	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-254	72	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-255	66	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-256	64	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-257	75	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-258	73	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-ILC-259	56	Invasive Lobular Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-META-1	54	Metaplastic Carcinoma	Primary	ER-/HER2-	MSK-IMPACT-410
MSK-META-2	34	Metaplastic Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-341
MSK-META-3	53	Metaplastic Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-META-4	41	Metaplastic Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-META-5	43	Metaplastic Carcinoma	Primary	ER-/HER2-	MSK-IMPACT-341
MSK-META-6	64	Metaplastic Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-META-7	59	Metaplastic Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-341
MSK-META-8	45	Metaplastic Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-META-9	39	Metaplastic Carcinoma	Primary	ER-/HER2-	MSK-IMPACT-341
MSK-META-10	47	Metaplastic Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-341
MSK-META-11	53	Metaplastic Carcinoma	Primary	ER-/HER2-	MSK-IMPACT-468
MSK-MPC-1	81	Micropapillary Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-MPC-2	38	Micropapillary Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-410
MSK-MPC-3	59	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-4	51	Micropapillary Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-MPC-5	58	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-6	46	Micropapillary Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-7	44	Micropapillary Carcinoma	Primary	ER-/HER2+	MSK-IMPACT-468
MSK-MPC-8	38	Micropapillary Carcinoma	Metastasis	ER-/HER2-	MSK-IMPACT-410
MSK-MPC-9	41	Micropapillary Carcinoma	Metastasis	ER+/HER2+	MSK-IMPACT-341
MSK-MPC-10	67	Micropapillary Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-11	41	Micropapillary Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-12	63	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-13	63	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-14	32	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-15	42	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-16	64	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-17	59	Micropapillary Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-410
MSK-MPC-18	62	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-19	53	Micropapillary Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MPC-20	66	Micropapillary Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-468
MSK-MUC-1	57	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-2	71	Mixed Mucinous Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-3	56	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-MUC-4	36	Mixed Mucinous Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-5	62	Mixed Mucinous Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-341

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MSK-MUC-6	54	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-MUC-7	32	Mixed Mucinous Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-8	47	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-341
MSK-MUC-9	29	Mixed Mucinous Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-341
MSK-MUC-10	50	Mixed Mucinous Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-410
MSK-MUC-11	63	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-12	36	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-13	40	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-MUC-14	46	Mixed Mucinous Carcinoma	Primary	ER+/HER2+	MSK-IMPACT-410
MSK-MUC-15	58	Mixed Mucinous Carcinoma	Metastasis	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-16	32	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-410
MSK-MUC-17	46	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-MUC-18	62	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468
MSK-MUC-19	46	Mixed Mucinous Carcinoma	Primary	ER+/HER2-	MSK-IMPACT-468

Supplementary Table 3. Comparison of the frequency of altered genes in breast cancers of histologic special type and invasive ductal carcinomas of no special type matched by clinicopathologic characteristics subjected to targeted massively parallel sequencing (MSK-IMPACT)

Gene Name	Invasive lobular carcinoma				Mixed mucinous breast carcinoma				Micropapillary breast cancer				Metaplastic breast cancer			
	Metastasis LC (n=132)	Metastasis DC-NST (n=244)	Primary LC (n=127)	P value* q value*	Metastasis DC-NST (n=15)	Metastasis Primary mixed mucinous (n=14)	Primary mixed mucinous (n=14)	P value* q value*	Metastasis Micro (n=12)	Metastasis Primary Micro (n=4)	Primary Micro (n=4)	P value* q value*	Metastasis Metaplastic (n=6)	Metastasis Primary Metaplastic (n=18)	Primary Metaplastic (n=5)	P value* q value*
ABL1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.005	0.64512	0.2474	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.25	1	1	0 (0.0%)	0 (0.0%)
ACT1	10 (7.6%)	20 (8.2%)	1 (0.8%)	0.047	0.141	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.1686	1
ACT2	1 (0.7%)	3 (1.1%)	0 (0.0%)	1	1	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ACT3	1 (0.7%)	2 (0.7%)	0 (0.0%)	0.224	0.224	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ALX1	5 (3.7%)	3 (1.1%)	0 (0.0%)	0.124	0.895125	0.0603	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	1	1	0 (0.0%)	0 (0.0%)	0.4457
ALX2	1 (0.7%)	2 (0.7%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
AREB1	1 (0.7%)	2 (0.7%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
APC	7 (5.3%)	6 (2.2%)	0 (0.0%)	0.181	0.847148	0.0145	0.66936	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1	1	0 (0.0%)	0 (0.0%)	0.4457
AR	5 (3.7%)	7 (2.6%)	1 (0.7%)	0.544	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ARAF	0 (0.0%)	5 (1.8%)	0 (0.0%)	0.1742	0.9625	0.0603	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ARID1A	11 (8.3%)	19 (7.2%)	10 (7.8%)	0.181	0.979923	0.6029	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ARID1B	3 (2.2%)	6 (2.2%)	1 (0.7%)	0.124	0.124	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ARID2	4 (3.0%)	8 (3.0%)	0 (0.0%)	1	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ARID3B	4 (3.0%)	6 (2.2%)	0 (0.0%)	0.482	0.482	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ASB1	2 (1.5%)	2 (0.7%)	1 (0.7%)	0.6034	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ATM	3 (2.2%)	3 (1.1%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ATM1	7 (5.3%)	8 (3.0%)	0 (0.0%)	0.243	0.243	0 (0.0%)	0 (0.0%)	0.25	1	0.2632	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ATR	4 (3.0%)	7 (2.6%)	2 (1.5%)	1	1	0.842	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
ATRX	4 (3.0%)	6 (2.2%)	2 (1.5%)	0.789	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
AURKA	1 (0.7%)	18 (6.5%)	1 (0.7%)	0.055	0.234375	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
AURKB	1 (0.7%)	0 (0.0%)	0 (0.0%)	0.333	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
AXIN1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.544	1	0.403	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
AXIN2	2 (1.5%)	9 (3.4%)	0 (0.0%)	0.349	1	0.482	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
AZ1	1 (0.7%)	3 (1.1%)	0 (0.0%)	1	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BAD1	0 (0.0%)	1 (0.3%)	0 (0.0%)	1	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BAP1	2 (1.5%)	2 (0.7%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BARD1	2 (1.5%)	2 (0.7%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BCL2	1 (0.7%)	1 (0.3%)	0 (0.0%)	1	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BCL2L1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.333	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BCL2L11	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.333	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BCL6	3 (2.2%)	3 (1.1%)	2 (1.5%)	0.649	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BCL7A	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BLM	5 (3.7%)	1 (0.3%)	0 (0.0%)	0.071	0.448462	0.0603	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRCA1	0 (0.0%)	4 (1.5%)	0 (0.0%)	0.306	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRCA2	2 (1.5%)	9 (3.4%)	0 (0.0%)	0.349	1	0.482	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRD4	2 (1.5%)	11 (4.1%)	0 (0.0%)	0.091	0.31031	0.2474	1	1	0.004	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRD9	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRG1	1 (0.7%)	6 (2.2%)	0 (0.0%)	0.424	1	1	1	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN1	2 (1.5%)	2 (0.7%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN2	5 (3.7%)	17 (6.4%)	10 (7.8%)	0.354	1	0.186	1	0.2632	1	0.2632	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN3	1 (0.7%)	0 (0.0%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN4	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN5	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN6	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN7	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN8	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN9	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN10	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN11	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN12	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN13	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN14	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN15	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN16	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN17	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN18	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN19	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN20	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN21	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN22	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN23	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN24	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN25	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN26	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN27	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN28	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN29	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN30	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN31	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN32	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN33	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN34	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN35	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN36	1 (0.7%)	1 (0.3%)	0 (0.0%)	0.6034	0.6034	0 (0.0%)	0 (0.0%)	1	1	1	1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4457	1
BRN37																













**Supplementary Table 5. Therapy received prior to sampling of metastatic lobular carcinomas according to *ERBB2* mutational status**

<b>Pre-biopsy therapy</b>	<b><i>ERBB2</i> L755S (n=7)</b>	<b>Other <i>ERBB2</i> mutations (n =9)</b>	<b>No <i>ERBB2</i> mutations (n=98)</b>	<b><i>P</i> value*</b>
Chemotherapy-containing	0 (0%)	0 (0%)	4 (4.1%)	n.s.
Chemotherapy-containing/Anti-HER2	0 (0%)	0 (0%)	1 (1%)	
Chemotherapy-containing/Hormone-therapy	6 (85.7%)	7 (77.8%)	72 (73.5%)	
Chemotherapy-containing/Hormone-therapy/Anti-HER2	1 (14.3%)	0 (0%)	4 (4.1%)	
Anti-HER2	0 (0%)	0 (0%)	3 (3.1%)	
Hormone-therapy	0 (0%)	1 (11.1%)	13 (13.3%)	
Hormone-therapy/Anti-HER2	0 (0%)	1 (11.1%)	1 (1%)	
<b>Last line of hormone therapy prior to biopsy</b>	<b><i>ERBB2</i> L755S (n=7)</b>	<b>Other <i>ERBB2</i> mutations (n =9)</b>	<b>No <i>ERBB2</i> mutations (n =90)</b>	<b><i>P</i> value*</b>
Aromatase inhibitors	5 (71.4%)	6 (66.7%)	51 (56.7%)	n.s.
Selective estrogen receptor degraders (SERD)	1 (14.3%)	0 (0%)	11 (12.2%)	
Selective estrogen receptor modulators (SERM)	1 (14.3%)	3 (33.3%)	28 (31.1%)	

\*Chi square test

n.s., not significant

**Supplementary Table 6. Therapy received prior to sampling of metastatic lobular carcinomas according to *ERBB2* mutational status**

Pre-biopsy therapy	mILC (n=114)	mIDC (n=235)	<i>P</i> value*	mMUC (n=5)	mIDC (n=13)	<i>P</i> value*	mMPC (n=9)	mIDC (n=33)	<i>P</i> value*	mMETA (n=6)	mIDC (n=18)	<i>P</i> value*
Chemotherapy-containing	4 (3.5%)	27 (11.5%)	n.s.	0 (0%)	1 (7.7%)	n.s.	1 (11.1%)	4 (12.1%)	n.s.	3 (50%)	8 (44.4%)	n.s.
Chemotherapy-containing/Anti-HER2	1 (0.9%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Chemotherapy-containing/Hormone-therapy	85 (74.6%)	158 (67.2%)		3 (60%)	9 (69.2%)		6 (66.7%)	26 (78.8%)		2 (33.3%)	6 (33.3%)	
Chemotherapy-containing/Hormone-therapy/Anti-HER2	5 (4.4%)	4 (1.7%)		2 (40%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Anti-HER2	3 (2.6%)	5 (2.1%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)		1 (16.7%)	0 (0%)	
Hormone-therapy	14 (12.3%)	30 (12.8%)		0 (0%)	3 (23.1%)		2 (22.2%)	3 (9.1%)		0 (0%)	3 (16.7%)	
Hormone-therapy/Anti-HER2	2 (1.8%)	11 (4.7%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)	1 (5.6%)	

\*Chi square test  
n.s., not significant