

Figure S1 Consistency of the mutational spectrum between this study and MSK tissue-based data. MSK, Memorial Sloan Kettering Cancer Center.

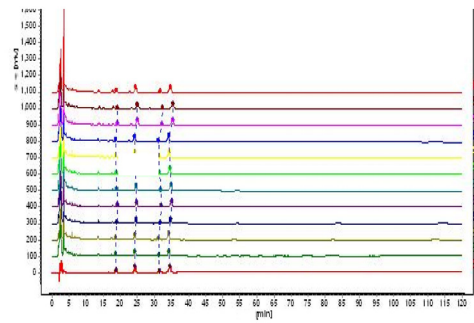


Figure S2 Functional enrichment analysis of mutated genes in MBC. MBC, metastatic breast cancer.

Table S1 Information of MSK group

	Overall(n=374)	HR+(n=317)	HER2+(n=26)	TNBC(n=31)	P-Value*
Age (range)	51(25-82)	51(25-82)	50(30-69)	51(27-74)	0.6915

*Differences between groups were assessed using Kruskal–Wallis test for continuous variables.

MSK: Memorial Sloan Kettering Cancer Center. HR: Hormone receptor. HER2: human epidermal growth factor receptor 2. TNBC: triple negative breast cancer.

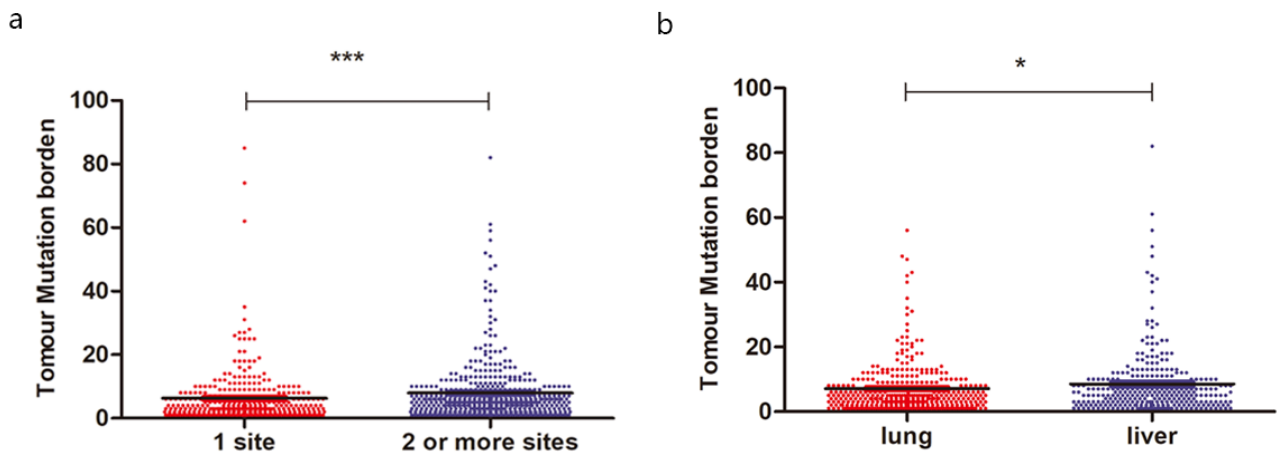


Figure S3 The number and site of metastasis in MBC associated with tumor mutations. (A) The number of metastatic sites was associated with gene alterations ($P=0.0003$). (B) There was also significant difference between mutational burden in lung metastasis and liver metastasis ($P=0.0467$). MBC, metastatic breast cancer.

Table S2 Information of NMBC group

	Overall(n=128)	HR+(n=84)	HER2+(n=22)	TNBC(n=22)	P-Value*
Age (range)	45(23-78)	43(23-78)	46(24-72)	44(26-75)	0.7847

*Differences between groups were assessed using Kruskal–Wallis test for continuous variables.

NMBC: non-metastatic breast cancer. HR: Hormone receptor. HER2: human epidermal growth factor receptor 2. TNBC: triple negative breast cancer.

Table S3 Mainly involved pathways according to metastatic sites in MBC

Sites	Mainly involved pathways	Log10(P)
	Pathways in cancer	-37.7
Bone	HDR through Homologous Recombination (HRR)	-36.2
	Homologous DNA Pairing and Strand Exchange	-36.2
	Pathways in cancer	-34.5
Brain	Prostate cancer	-31.3
	Diseases of signal transduction by growth factor receptors and second messengers	-26.8
	Pathways in cancer	-34.5
Liver	HDR through Homologous Recombination (HRR)	-33.3
	Resolution of D-loop Structures through Holliday Junction Intermediates	-33.1
	Homologous DNA Pairing and Strand Exchange	-36.1
Lung	HDR through Homologous Recombination (HRR)	-35.5
	Resolution of D-loop Structures through Holliday Junction Intermediates	-34.9

MBC: metastatic breast cancer.