

Table S2. Comparison of gene mutations (top20) between the ZFHX3-MT and ZFHX3-WT tumors in the ICI-treated cohort (Samstein et.al)

Gene	ZFHX3-MT	ZFHX3-WT	Gene-MT (ZFHX3-MT)	Gene-MT (ZFHX3-WT)	Pvalue (Fisher's exact test)
TP53	27	323	22	195	0.0377402
KRAS	27	323	11	113	0.537556
KEAP1	27	323	5	65	1
STK11	27	323	5	65	1
EGFR	27	323	2	41	0.554051
PTPRD	27	323	8	35	0.00999795
RBM10	27	323	5	33	0.194279
EPHA3	27	323	7	30	0.0152164
PTPRT	27	323	5	30	0.169837
SMARCA4	27	323	6	29	0.0402388
NF1	27	323	4	30	0.316448
FAT1	27	323	7	26	0.00785888
ARID1A	27	323	4	26	0.270864
EPHA5	27	323	2	27	1
PIK3CG	27	323	3	24	0.451217
RB1	27	323	2	23	1
BRAF	27	323	2	22	0.706476
PIK3CA	27	323	4	20	0.102006
ATM	27	323	1	22	1

Table S2. Comparison of gene mutations (top20) between the ZFHX3-MT and ZFHX3-WT tumors in the TCGA-NSCLC cohort

Gene	ZFHX3-MT	ZFHX3-WT	Gene-MT (ZFHX3-MT)	Gene-MT (ZFHX3-WT)	Pvalue (Chi-Square test)
TP53	60	941	46	582	0.030471446
TTN	60	941	45	536	0.009043
CSMD3	60	941	33	364	0.017833463
MUC16	60	941	33	361	0.015469991
RYR2	60	941	29	334	0.061874046
LRP1B	60	941	26	299	0.086954139
USH2A	60	941	27	286	0.026234347
ZFHX4	60	941	25	269	0.044362852
SPTA1	60	941	14	210	0.981284577

XIRP2	60	941	19	199	0.079647264
FLG	60	941	17	192	0.193120495
SYNE1	60	941	17	191	0.185710325
NAV3	60	941	14	184	0.585426419
PCDH15	60	941	18	169	0.031616612
FAM135B	60	941	16	169	0.130229559
RYR3	60	941	19	165	0.010220667
COL11A1	60	941	21	159	0.000760243
CDH10	60	941	19	157	0.005419866
PAPPA2	60	941	10	165	1
ADAMTS12	60	941	8	166	0.497787291