

Table 3A: Comparison of RNA expression of tumor specific mutated transcripts between ctDNA detected mutated genes and all mutated genes in primary tumor.

	Number of estimated peptides		
	No-Expression	Expression	Fisher
CRCR1P			
RNA exp. of ctDNA detected mutated genes in primary (%)	3794 (57.75)	2776 (42.25)	<0.0001*
RNA exp. of all mutated genes in primary (%)	12082 (70.31)	5103 (29.69)	
CRCR4P	No-Expression	Expressed	Fisher
RNA exp. of ctDNA detected mutated genes in primary (%)	754 (66.49)	380 (33.51)	<0.0001*
RNA exp. of all mutated genes in primary (%)	1884 (31.66)	3552 (65.34)	
CRCR7P	No-Expression	Expressed	Fisher
RNA exp. of ctDNA detected mutated genes in primary (%)	7260(45.75)	8610 (54.25)	<0.0001*
RNA exp. of all mutated genes in primary (%)	13585(53.34)	11885(46.66)	
CRCR8P	No-Expression	Expressed	Fisher
RNA exp. of ctDNA detected mutated genes in primary (%)	2680(50.64)	2612(49.36)	<0.0001*
RNA exp. of all mutated genes in primary (%)	10559(59.43)	7207(40.57)	
CRCR9P	No-Expression	Expressed	Fisher
RNA exp. of ctDNA detected mutated genes in primary (%)	396 (14.77)	2286 (85.23)	<0.0001*
RNA exp. of all mutated genes in primary (%)	7506 (58.57)	5310 (41.43)	

Table 3B: Comparison of the estimated binding affinity to HLA (IC50) between ctDNA detected mutated genes and all mutated genes in primary tumor.

	Number of estimated peptides		
	low Affinity : IC50>50	High Affinity: IC50<50	Fisher
CRCR1P			
Neoantigens of ctDNA detected mutated genes in primary (%)	6519 (99.22)	51 (0.78)	p=0.0109
Neoantigens of all mutated genes in primary (%)	16987 (98.85)	198 (1.15)	
CRCR4P	low affinity	High affinity	
Neoantigens of ctDNA detected mutated genes in primary (%)	1131(99.74)	3 (0.26)	ns
Neoantigens of all mutated genes in primary (%)	5411 (99.54)	25(0.46)	
CRCR7P	low affinity	High affinity	
Neoantigens of ctDNA detected mutated genes in primary (%)	15810(99.62)	60 (0.38)	ns
Neoantigens of all mutated genes in primary (%)	25352(99.54)	118(0.46)	
CRCR8P	low affinity	High affinity	
Neoantigens of ctDNA detected mutated genes in primary (%)	5262(99.43)	30 (0.57)	ns
Neoantigens of all mutated genes in primary (%)	17646(99.32)	120(0.68)	
CRCR9P	low affinity	High affinity	
Neoantigens of ctDNA detected genes in primary (%)	2674(99.70)	8 (0.30)	ns
Neoantigens of all mutated genes in primary (%)	12764(99.67)	52(0.33)	