

**Supplement Table S1. Ongoing Clinical Trials of Combining ICIs and Targeted Drugs**

Disease	Phase	ICIs	Combined drugs	Name /No.	Status
<b>Angiogenesis inhibitors</b>					
Early HCC	III	Atezolizumab	Bevacizumab vs. Active surveillance	IMbrave050	Recruiting
Advanced NSCLC	II	Avelumab	Axitinib	NCT03472560	Active, not recruiting
Stage III/IV unresectable melanoma	II	Ipilimumab	Bevacizumab	NCT01950390	Active, not recruiting
<b>EGFR/HER2 inhibitors</b>					
Recurrent or metastatic HNSCC	II	Pembrolizumab	Afatinib	ALPHA	Active, not recruiting
Recurrent or metastatic HNSCC	II	Pembrolizumab	Cetuximab	NCT03082534	Active, not recruiting
<b>PARP inhibitors</b>					
Stage III/IV non-mucinous EOC	III	Dostarlimab	Niraparib+SOC vs. SOC(Carboplatin+Paclitaxel+Bevacizumab)	NCT03602859	Active, not recruiting
Advanced OC	III	Avelumab	Talazoparib+Paclitaxel+Carboplatin vs. Bevacizumab+Paclitaxel+Carboplatin and Talazoparib+Paclitaxel+Carboplatin	JAVELIN OVARIAN PARP 100	Active, not recruiting
BRCA1/2-deficient OC	I/II	Tremelimumab	Olaparib	NCT02571725	Active, not recruiting
<b>MAPK/ERK signaling inhibitors</b>					
Metastatic, recurrent or refractory NSCLC	II	Atezolizumab	Cobimetinib	NCT03600701	Recruiting
MSS metastatic colon	II	Durvalumab	Trametinib	NCT03428126	Recruiting

cancer

Metastatic refractory mutant TC	radioiodine $BRAF^{V600}$	II	Nivolumab	Encorafenib+Binimetinib vs. Encorafenib+Binimetinib	NCT04061980	Recruiting
Advanced TNBC	or metastatic	I/II	Pembrolizumab	Binimetinib	NCT03106415	Recruiting
Advanced NSCLC		I	Pembrolizumab	Binimetinib	NCT03991819	Recruiting
<b>CDK inhibitors</b>						
ER+ mBC		II	Avelumab	Palbocicli+Endocrine therapy vs. Avelumab+Endocrine therapy	ImmunoADAPT	Recruiting
NSCLC		I	Pembrolizumab	Abemaciclib	NCT02779751	Active, not recruiting
<b>PI3K/AKT/mTOR signaling pathway inhibitors</b>						
Advanced UC		II	Nivolumab	Eganelisib vs. Nivolumab	MARIO-275	Active, not recruiting
Metastatic melanoma		I/II	Pembrolizumab	GSK2636771	NCT03131908	Active, not recruiting
HNSCC		I/II	Nivolumab	Copanlisib	NCT03735628	Active, not recruiting
Colon cancer		I/II	Nivolumab	Copanlisib	NCT03711058	Active, not recruiting
<b>Hormone receptor inhibitors</b>						
mCRPC		II	Nivolumab	Enzalutamide	NCT03338790	Active, not recruiting
Small cell neuroendocrine PC		II	Cetrelimab	Apalutamide	NCT04926181	Not yet recruiting

HR+, HER2- advanced or II Pembrolizumab Fulvestrant  
metastatic BC

NCT03393845

Recruiting

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HCC: hepatocellular carcinoma; NSCLC: non-small cell lung cancer; HNSCC: head and neck squamous cell carcinoma; OC: ovarian cancer; EOC: epithelial ovarian cancer; TC: thyroid cancer; TNBC: triple-negative breast cancer; BC: breast cancer; mBC: metastatic breast cancer; UC: urothelial carcinoma; mCRPC: metastatic castration-resistant prostate cancer; PC: prostate cancer; MSS: microsatellite stable; ER+: estrogen receptor positive; HR+: hormone receptor positive; HER2-: HER2 negative.