

Supplementary Table 1: list of clinical trials that are presently active and recruiting relapsed/refractory OS patients

ClinicalTrials.gov NCT Identifier	Tumor Histotype	Phase	Randomization	Line of therapy	Requested Target- Alteration for enrollment	Investigational Drug	Target drug	Association with Chemotherapy	Eligibility Age (years)
NCT01669369	OS	IV	Yes	First line	None	Lithium Carbonate	No	Yes	8 -70
NCT02013336	Solid Tumor	I	No	Second and other	None	Irinotecan Sucrosafate Liposome	No	Yes	1 - 21
NCT02173093	Solid Tumor	I/II	No	Second and other	None	Anti-CD3 x hu3F8 bispecific antibody (GD2Bi)-armed activated T cells	Yes	No	1 - 29
NCT02389244	Bone Sarcoma	II	Yes	Second and other	None	Regorafenib	Yes	No	>10
NCT02406781	Solid Tumor	II	No	Second and other	None	Pembrolizumab	Yes	Yes	>18
NCT02502786	OS	II	No	Second and other	None	Hu3F8	Yes	No	1 - 40
NCT02517918	Solid Tumor	I	No	Second and other	None	Sirolimus	Yes	Yes	>13
NCT02536183	Solid Tumor	I	No	Second and other	None	Lyso-thermosensitive liposomal doxorubicin	No		<30
NCT02574728	Solid Tumor	II	No	Second and other	None	Sirolimus	Yes	Yes	1 – 30
NCT02644460	Solid Tumor	I	No	Second and other	None	Abemaciclib	Yes	No	2 – 25
NCT02945800	ALL Sarcoma	II	No	Second and other	None	Nab-Paclitaxel + Gemcitabine	No	/	12 - 30
NCT03063983	OS	II	Yes	Maintenance Therapy	None	Metronomic MTX plus cyclophosphamide	No	Yes	<30

NCT03093909	Solid Tumor	I	No	Second and other	None	Inhalatory Gemcitabine	No	No	12 - 50
NCT03155620/NCT04284774(tipifarnib)	Solid Tumor	II	No	Second and other	HRAS gene alterations	Tipifarnib	Yes	No	1 - 21
NCT03190174	Solid Tumor	I/II	No	Second and other	mTOR Activating Mutations	ABI-009 + nivolumab	Yes	No	>12
NCT03210714	Solid Tumor	II	No	Second and other	FGFR1, FGFR2, FGFR3, or FGFR4 gene mutation	Erdafitinib	Yes	No	>12
NCT03213652	Solid Tumor	II	No	Second and other	ALK or ROS1 gene alteration	Ensartinib	Yes	No	1 - 21
NCT03213678	Solid Tumor	II	No	Second and other	TSC1, TSC2, or PI3K/mTOR gene mutation	LY3023414	Yes	No	1 - 21
NCT03213704	Solid Tumor	II	No	Second and other	NTRK1, NTRK2, or NTRK3 gene fusion	Larotrectinib	Yes	No	1 - 21
NCT03220035	Solid Tumor	II	No	Second and other	BRAF V600 gene mutation	Vemurafenib	Yes	No	1 - 21
NCT03233204	Solid Tumor	II	No	Second and other	ATM, BRCA1, BRCA2, RAD51C, RAD51D mutations	Olaparib	Yes	No	1 - 21
NCT03277924	ALL Sarcoma	I/II	No	ALL*	None	Sunitinib+Nivolumab	Yes	No	12 - 80
NCT03425279	Solid Tumor	I/II	No	Second and other	None	Conditionally active biologic anti-AXL antibody drug conjugate	Yes	Yes	Phase I: ≥ 18 Phase II: ≥ 12
NCT03449108	Solid Tumor	II	No	Second and other	None	Autologous tumor infiltrating lymphocytes LN-145	No	Conditioning regimen	16 - 70
NCT03449901	Solid Tumor	II	No	First line + Second Line	None	ADI-PEG 20	No	Yes	>10
NCT03458728	Solid Tumor	I/II	No	Second and other	None	Copanlisib	Yes	No	6 months – 21 years

NCT03462316	ALL Sarcoma	I	No	Second and other	IHC positive staining for NY-ESO-1	NY-ESO-1 CAR-T	Yes	Conditioning regimen	14 - 70
NCT03478462	Solid Tumor	I	No	Second and other	None	CLR 131	No	No	2 – 21
NCT03507491	Solid Tumor	I	No	Second and other	None	Nab-Paclitaxel	No	Yes	6 months – 30 years
NCT03525392	Solid Tumor	I/II	No	Second and other	None	177Lu-3BP-227	No	No	>18
NCT03526250	Solid Tumor	II	No	Second and other	Alterations in cell cycle genes and positive Rb expression by IHC	Palbociclib	Yes	No	1 - 21
NCT03598595	OS	I/II	No	Second and other	None	Hydroxychloroquine	No	Yes	≥12
NCT03618381	Solid Tumor	I	No	Second and other	EGFR expression	EGFR 806 CAR-T	Yes		< 26
NCT03628209	OS	I/II	No	Second and other	None	Nivolumab	Yes	Yes	< 39
NCT03635632	Solid Tumor	I	No	Second and other	positive GD2 expression by IHC	C7R-GD2 CAR-T	Yes	Conditioning regimen	1 - 74
NCT03643133	OS	II	Yes	First line	None	Mifamurtide	No	Yes	< 50
NCT03676985	OS	I/II	No	Maintenance Therapy	None	ZKAB001	Yes	Yes	18 - 55
NCT03678883	Solid Tumor	I/II	No	Second and other	None	9-ING-41	Yes	Yes	>18
NCT03698994	Solid Tumor	II	No	Second and other	MAPK pathway mutations	Ulixertinib	Yes	No	1 - 21
NCT03709680	Solid Tumor	I	No	Second and other	None	Palbociclib	Yes	Yes	≥2 - <21

NCT03718091	Solid Tumor	II	No	Second and other	None	M6620 (VX-970)	Yes	No	≥ 12
NCT03742193	OS	II	No	Second and other	None	Apatinib	Yes	Yes	10 - 50
NCT03860207	Solid Tumor	I/II	No	Second and other	None	Humanized anti-GD2 x anti-CD3 bispecific antibody (hu3F8-BsAb)	Yes	No	≥ 2
NCT03900793	OS	I	No	Second and other	None	Sunitinib	Yes	No	10 - 40
NCT03932071	OS	IV	Yes	First line	None	Zoledronic Acid	No	Yes	all age
NCT04040205	ALL Sarcoma	II	No	Second and other	Abnormalities in the Cyclin D1 - CDK4/6 - Rb pathway	Abemaciclib	Yes	No	≥ 18
NCT04055220	Bone Sarcoma	II	Yes	Maintenance Therapy	None	Regorafenib	Yes	Yes	≥ 16
NCT04154189	OS	II	Yes	Second and other	None	Lenvatinib	Yes	Yes	2 - 25
NCT04183062	Bone Sarcoma	II	No	First line + Second Line	None	BIO-11006	No	Yes	5 - 21
NCT04195555	Solid Tumor	II	No	Second and other	IDH1 genetic alterations	Ivosidenib	Yes	No	1 - 21
NCT04238819	Solid Tumor	I	No	Second and other	None	Abemaciclib	Yes	Yes	< 18
NCT04294511	OS	II	No	First line	None	Camrelizumab	Yes	Yes	14 – 65
NCT04308330	Solid Tumor	I	No	Second and other	None	Vorinostat	Yes	Yes	1 – 30
NCT04320888	Solid Tumor	II	No	Second and other	activating RET mutations	Selpercatinib	Yes	No	1 - 21

NCT04351308	OS	II	Yes	First line	None	Camrelizumab versus apatinib	Yes	Yes	≥ 12
NCT04417062	OS	II	No	Second and other	None	Olaparib + Ceralasertib	Yes	No	12 - 30
NCT04433221	ALL Sarcoma	I/II	No	Second and other	IHC positive staining for GD2 or PSMA or Her2 or CD276	CAR-T	Yes	Yes	≥ 6 months - ≤80 years
NCT04483778	Solid Tumor	I	No	Second and other	None	B7H3-specific CAR-T versus bispecific B7H3xCD19 CAR-T	Yes		< 26
NCT04544995	Solid Tumor	I	No	Second and other	BRCAness mutational signature (mutational signature 3)	Niraparib + Dostarlimab	Yes	No	6 months – 17 years
NCT04595994	ALL Sarcoma	I/II	Yes	Second and other	None	Selinexor	No	Yes	18 - 80