

Supplementary Materials

Precision medicine of rare tumors: uncovering the potential actionable targets through genomic profiling

Guomin Lin^{1,#}, Yue Hao^{2,#}, Qian Wang^{3,#}, Yuanzhi Lu⁴, Tangfeng Lv⁵, Youcai Zhu⁶, Weiwei Pan⁷, Shirong Zhang⁸, Zhenying Guo⁹, Xingxiang Pu¹⁰, Bin Lian¹¹, Zhengbo Song², Chunwei Xu²

¹Department of R&D, Shanghai Mol-Compass Biotech Co., Ltd, Shanghai, Shanghai 201313, China.

²Department of Medical Oncology, Zhejiang Cancer Hospital, Hangzhou Institute of Medicine (HIM), Chinese Academy of Sciences, Hangzhou 310022, Zhejiang, China.

³Department of Respiratory Medicine, Affiliated Hospital of Nanjing University of Chinese Medicine, Jiangsu Province Hospital of Chinese Medicine, Nanjing 210029, Jiangsu, China.

⁴Department of Pathology, The First Affiliated Hospital of Jinan University, Guangzhou 510630, Guangdong, China.

⁵Department of Respiratory Medicine, Affiliated Jinling Hospital, Medical School of Nanjing University, Nanjing 210002, Jiangsu, China.

⁶Department of Thoracic Disease Diagnosis and Treatment Center, Zhejiang Rongjun Hospital, The Third Affiliated Hospital of Jiaying University, Jiaying 314000, Zhejiang, China.

⁷Department of Cell Biology, College of Medicine, Jiaying University, Jiaying 314001, Zhejiang, China.

⁸Translational Medicine Research Center, Key Laboratory of Clinical Cancer Pharmacology and Toxicology Research of Zhejiang Province, Affiliated Hangzhou First People's Hospital, Cancer Center, West Lake University School of Medicine, Hangzhou 310006, Zhejiang, China.

⁹Department of Pathology, Zhejiang Provincial People's Hospital, Affiliated People's Hospital, Hangzhou Medical College, Hangzhou 310014, Zhejiang, China.

¹⁰The Second Department of Thoracic Oncology, Hunan Cancer Hospital/The Affiliated Cancer Hospital of Xiangya School of Medicine, Central South University, Changsha 410013,

Hunan, China.

¹¹Key Laboratory of Carcinogenesis and Translational Research (Ministry of Education/Beijing), Department of Melanoma and Sarcoma, Peking University Cancer Hospital & Institute, Beijing 100142, China.

[#]These authors contributed equally to this work.

Correspondence to: Dr. Chun-wei Xu, Department of Medical Oncology, Zhejiang Cancer Hospital, Hangzhou Institute of Medicine (HIM), Chinese Academy of Sciences, Hangzhou 310022, Zhejiang, China. E-mail: xuchunweibbb@163.com; Dr. Zhengbo Song, Department of Medical Oncology, Zhejiang Cancer Hospital, Hangzhou Institute of Medicine (HIM), Chinese Academy of Sciences, Hangzhou, Zhejiang 310022, China. E-mail: songzb@zjcc.org.cn; Dr. Bin Lian, Key Laboratory of Carcinogenesis and Translational Research (Ministry of Education/Beijing), Department of Melanoma and Sarcoma, Peking University Cancer Hospital & Institute, Beijing 100142, China. E-mail: lianbin0214@126.com

Supplementary Table 1. List of cancer types included in this study

Classification system	Cancer type	N	Matched cancer type in CCBM knowledgebase
Breast	Adenoid Cystic Breast Cancer	50	Solid tumor > Breast cancer
Breast	Breast Invasive Mixed Mucinous Carcinoma	63	Solid tumor > Breast cancer
CUP	Cancer of Unknown Primary	292	Solid tumor > Cancer of unknown primary
Digestive system	Cholangiocarcinoma	302	Solid tumor > Biliary tract cancer > Cholangiocarcinoma
Digestive system	Duodenal Adenocarcinoma	141	Solid tumor > Small bowel cancer
Digestive system	Extrahepatic Cholangiocarcinoma	417	Solid tumor > Biliary tract cancer > Cholangiocarcinoma

Digestiv e system	Gallbladder Cancer	157 3	Solid tumor > Biliray tract cancer
Digestiv e system	Hepatoblastoma	37	Solid tumor
Digestiv e system	Intrahepatic Cholangiocarcinoma	141 4	Solid tumor > Biliray tract cancer > Cholangiocarcinoma
Digestiv e system	Medullary Carcinoma of the Colon	23	Solid tumor
Digestiv e system	Pancreatobiliary Ampullary Carcinoma	128	Solid tumor > Ampullary cancer
Digestiv e system	Pancreatoblastoma	6	Solid tumor
Digestiv e system	Perihilar Cholangiocarcinoma	143	Solid tumor > Biliray tract cancer > Cholangiocarcinoma
Digestiv e system	Small Intestinal Carcinoma	19	Solid tumor
Endocrin e system	Adrenocortical Carcinoma	285	Solid tumor
Endocrin e system	Medullary Thyroid Cancer	26	Solid tumor > Thyroid cancer
Endocrin e system	Pituitary Carcinoma	6	Solid tumor
Head and neck/Eye	Acinic Cell Carcinoma	7	Solid tumor > Head and neck cancer > Salivary gland cancer
Head and neck/Eye	Adenoid Cystic Carcinoma	142 7	Solid tumor > Head and neck cancer > Salivary gland cancer
Head and neck/Eye	Clear Cell Odontogenic Carcinoma	1	Solid tumor > Head and neck cancer

Head and neck/Eye	Epithelial-Myoepithelial Carcinoma	2	Solid tumor > Head and neck cancer
Head and neck/Eye	Mammary Analogue Secretory Carcinoma of Salivary Gland Origin	6	Solid tumor > Head and neck cancer > Salivary gland cancer
Head and neck/Eye	Mucoepidermoid Carcinoma	4	Solid tumor > Head and neck cancer > Salivary gland cancer
Head and neck/Eye	Myoepithelial Carcinoma	9	Solid tumor > Head and neck cancer > Salivary gland cancer
Head and neck/Eye	Retinoblastoma	491	Solid tumor
Head and neck/Eye	Salivary Adenocarcinoma	5	Solid tumor > Head and neck cancer > Salivary gland cancer
Head and neck/Eye	Salivary Duct Carcinoma	24	Solid tumor > Head and neck cancer > Salivary gland cancer
Head and neck/Eye	Sinonasal Adenocarcinoma	6	Solid tumor > Head and neck cancer
Head and neck/Eye	Sinonasal Undifferentiated Carcinoma	2	Solid tumor > Head and neck cancer
Lung	Adenoid Cystic Carcinoma of the Lung	84	Solid tumor > Non-small cell lung cancer
Lung	Basaloid Large Cell Carcinoma of the Lung	1	Solid tumor > Non-small cell lung cancer

Lung	Clear Cell Carcinoma of the Lung	2	Solid tumor > Non-small cell lung cancer
Lung	Lymphoepithelioma-like Carcinoma of the Lung	5	Solid tumor > Non-small cell lung cancer
Lung	Mucoepidermoid Carcinoma of the Lung	3	Solid tumor > Non-small cell lung cancer
Lung	Pleuropulmonary Blastoma	6	Solid tumor
Lung	Sarcomatoid Carcinoma of the Lung	24	Solid tumor
Lung	Spindle Cell Carcinoma of the Lung	6	Solid tumor > Non-small cell lung cancer
Mesothelioma	Peritoneal Mesothelioma	593	Solid tumor > Mesothelioma
Mesothelioma	Pleural Mesothelioma	375	Solid tumor > Mesothelioma
Mesothelioma	Testicular Mesothelioma	2	Solid tumor > Mesothelioma
Neural system	Anaplastic Astrocytoma	126 6	Solid tumor > Glioma > Astrocytoma
Neural system	Anaplastic ependymoma	10	Solid tumor
Neural system	Anaplastic Meningioma	2	Solid tumor
Neural system	Anaplastic Oligoastrocytoma	6	Solid tumor > Glioma > Astrocytoma
Neural system	Anaplastic Oligodendroglioma	84	Solid tumor > Glioma > Oligodendroglioma
Neural system	Astroblastoma	2	Solid tumor
Neural system	Astrocytoma	242	Solid tumor > Glioma > Astrocytoma

Neural system	Atypical Meningioma	6	Solid tumor
Neural system	Atypical teratoid/rhabdoid tumor	20	Solid tumor
Neural system	Choriocarcinoma	412	Solid tumor
Neural system	Desmoplastic/Nodular Medulloblastoma	29	Solid tumor > Medulloblastoma
Neural system	Diffuse Astrocytoma	122	Solid tumor > Glioma > Astrocytoma
Neural system	Diffuse Intrinsic Pontine Glioma	14	Solid tumor
Neural system	Embryonal Carcinoma	655	Solid tumor
Neural system	Embryonal Tumor	3	Solid tumor
Neural system	Embryonal Tumor with Abundant Neuropil and True Rosettes	4	Solid tumor
Neural system	Ependymoma	127	Solid tumor
Neural system	Ganglioneuroblastoma	4	Solid tumor > Neuroblastoma
Neural system	Glioblastoma	343 9	Solid tumor > Glioma > Glioblastoma
Neural system	Glioma	48	Solid tumor > Glioma
Neural system	Hemangioblastoma	3	Solid tumor
Neural system	High-Grade Glioma, NOS	135	Solid tumor

Neural system	Large Cell/Anaplastic Medulloblastoma	202	Solid tumor > Medulloblastoma
Neural system	Malignant Peripheral Nerve Sheath Tumor	416	Solid tumor
Neural system	Malignant Teratoma	1	Solid tumor
Neural system	Medulloblastoma	867	Solid tumor > Medulloblastoma
Neural system	Medulloepithelioma	2	Solid tumor
Neural system	Meningioma	150	Solid tumor
Neural system	Neuroblastoma	275 3	Solid tumor > Neuroblastoma
Neural system	Olfactory Neuroblastoma	3	Solid tumor > Neuroblastoma
Neural system	Oligoastrocytoma	144	Solid tumor > Glioma > Astrocytoma
Neural system	Oligodendroglioma	336	Solid tumor > Glioma > Oligodendroglioma
Neural system	Pilocytic astrocytoma	105	Solid tumor > Glioma > Astrocytoma
Neural system	Pleomorphic Xanthoastrocytoma	10	Solid tumor > Glioma > Astrocytoma
Neural system	Primitive Neuroectodermal Tumor	12	Solid tumor
Neural system	Rhabdoid Meningioma	129	Solid tumor
Neuroendocrine system	Gastroenteropancreatic neuroendocrine neoplasm	832	Solid tumor > Neuroendocrine tumor

Neuroendocrine system	Paraganglioma	115	Solid tumor > Neuroendocrine tumor > Paraganglioma/Pheochromocytoma
Neuroendocrine system	Pheochromocytoma	178	Solid tumor > Neuroendocrine tumor > Paraganglioma/Pheochromocytoma
NUT	NUT Carcinoma	1	Solid tumor
Reproductive system	Clear Cell Ovarian Cancer	125	Solid tumor > Ovarian cancer
Reproductive system	Dysgerminoma	1	Solid tumor > Malignant germ cell tumor
Reproductive system	Endometrioid Ovarian Cancer	47	Solid tumor > Ovarian cancer
Reproductive system	Penile Squamous Cell Carcinoma	34	Solid tumor > Penile cancer
Reproductive system	Poorly Differentiated Vaginal Carcinoma	2	Solid tumor > Vaginal cancer
Reproductive system	Prostate Small Cell Carcinoma	21	Solid tumor > Prostate cancer
Reproductive system	Squamous Cell Carcinoma of the Vulva/Vagina	31	Solid tumor > Vaginal cancer & Vulval cancer
Reproductive system	Vaginal Adenocarcinoma	67	Solid tumor > Vaginal cancer

Skin	Aggressive Digital Papillary Adenocarcinoma	201	Solid tumor
Skin	Basal Cell Carcinoma	55	Solid tumor
Skin	Cutaneous Squamous Cell Carcinoma	412	Solid tumor
Skin	Merkel Cell Carcinoma	193	Solid tumor
Skin	Sebaceous Carcinoma	15	Solid tumor
Skin	Skin Adnexal Carcinoma	20	Solid tumor
Skin	Sweat Gland Adenocarcinoma	7	Solid tumor
Skin	Sweat Gland Carcinoma/Apocrine Eccrine Carcinoma	6	Solid tumor
Soft tissue/Bone	Alveolar Soft Part Sarcoma	90	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Angiosarcoma	1798	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Breast Invasive Carcinosarcoma	7	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Chondrosarcoma	473	Solid tumor > Bone tumor > Chondrosarcoma
Soft tissue/Bone	Chordoma	85	Solid tumor > Bone tumor > Chordoma
Soft tissue/Bone	Clear Cell Sarcoma	92	Solid tumor > Soft tissue sarcoma

Soft tissue/Bone	Dermatofibrosarcoma Protuberans	46	Solid tumor > Soft tissue sarcoma > Dermatofibrosarcoma protuberans
Soft tissue/Bone	Desmoid/Aggressive Fibromatosis	25	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Desmoplastic Small-Round-Cell Tumor	138	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Endometrial Stromal Sarcoma	361	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Epithelioid Hemangioendothelioma	89	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Epithelioid Sarcoma	109	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Ewing Sarcoma	137 2	Solid tumor > Bone tumor
Soft tissue/Bone	Fibrosarcoma	113	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Dendritic Cell Sarcoma	7	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Gastrointestinal Stromal Tumor	160 5	Solid tumor > Soft tissue sarcoma > Gastrointestinal stromal tumor

Soft tissue/Bone	Glomangiosarcoma	2	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Hemangioma	6	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Inflammatory Myofibroblastic Tumor	79	Solid tumor > Soft tissue sarcoma > Inflammatory myofibroblastic tumor
Soft tissue/Bone	Intimal Sarcoma	18	Solid tumor > Soft tissue sarcoma > Intimal sarcoma
Soft tissue/Bone	Leiomyosarcoma	2520	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Liposarcoma	1330	Solid tumor > Soft tissue sarcoma > Liposarcoma
Soft tissue/Bone	Low-Grade Fibromyxoid Sarcoma	75	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Myofibroma	2	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Myxofibrosarcoma	268	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Osteosarcoma	1304	Solid tumor > Bone tumor

Soft tissue/Bone	Ovarian Carcinosarcoma/Malignant Mixed Mesodermal Tumor	23	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Rhabdomyosarcoma	730	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Sarcoma, NOS	1560	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Sclerosing Epithelioid Fibrosarcoma	1777	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Soft Tissue Myoepithelial Carcinoma	11	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Synovial Sarcoma	448	Solid tumor > Soft tissue sarcoma > Synovial sarcoma
Soft tissue/Bone	Undifferentiated Pleomorphic Sarcoma/Malignant Fibrous Histiocytoma/High-Grade Spindle Cell Sarcoma	319	Solid tumor > Soft tissue sarcoma
Soft tissue/Bone	Uterine Adenosarcoma	14	Solid tumor > Soft tissue sarcoma > Uterine sarcoma
Thymus	Thymic Carcinoma	159	Solid tumor > Thymic tumor > Thymic carcinoma
Thymus	Thymic Epithelial Tumor	32	Solid tumor > Thymic tumor
Thymus	Thymoma	152	Solid tumor > Thymic tumor
Urinary system	Plasmacytoid/Signet Ring Cell Bladder Carcinoma	38	Solid tumor

Urinary system	Renal Non-Clear Cell Carcinoma	501	Solid tumor > Renal cell carcinoma
Urinary system	Sarcomatoid Carcinoma of the Urinary Bladder	3	Solid tumor
Urinary system	Small Cell Bladder Cancer	17	Solid tumor

Supplementary Table 2. List of study cohorts included in this study

Included study cohorts		
acbc_mskcc_2015	glioma_mskcc_2019	nst_nfosi_ntap
acc_2019	hcc_msk_2024	odg_msk_2017
acc_tcga_gdc	heme_msk_impact_2022	os_target_gdc
acc_tcga_pan_can_atlas_2018	hgsoc_msk_2021	paired_bladder_2022
acyc_mda_2015	hnc_mskcc_2016	pan_origimed_2020
acyc_mgh_2016	hnsc_a5consortium_2025	pancan_hcmi_2025
angs_painter_2020	ihch_ismms_2015	pancan_mappyacts_2022
angs_painter_2025	ihch_smmu_2014	pancan_mimsi_msk_2024
angs_project_painter_2018	kich_tcga_pan_can_atlas_2018	pancan_pcawg_2020
biliary_tract_msk_2026	kirp_tcga_pan_can_atlas_2018	pancan_pdmr_2025
blca_plasmacytoid_mskcc_2016	lgg_ctf_synodos_2025	pancan_ped_mai_msk_2025
bm_nscic_mskcc_2023	lgg_tcga	pancreas_msk_2024
bowel_colitis_msk_2022	lgg_tcga_pan_can_atlas_2018	panet_arcnet_2017
brain_cptac_2020	lgg_ucsf_2014	panet_jhu_2011
brca_metabric	lipo_msk_2024	panet_msk_2018
brca_tcga	lms_msk_2024	panet_msk_erc_2023
brca_tcga_pan_can_atlas_2018	lung_msk_mind_2020	panet_shanghai_2013
breast_ink4_msk_2021	mbi_broad_2012	pcpg_tcga
breast_msk_2025	mbi_dkfz_2017	pcpg_tcga_pan_can_atlas_2018

chol_jhu_2013	mbi_icgc	pcpg_tcga_pub
chol_msk_2018	mbi_pcgp	pediatric_dkfz_2017
chol_tcga	mbi_sickkids_2016	plmeso_msk_2024
chol_tcga_pan_can_atlas_2018	meso_tcga	plmeso_nyu_2015
crc_eo_2020	meso_tcga_pan_can_atlas_2018	pog570_bcgsc_2020
cscd_dfarber_2015	metastatic_solid_tumors_mich_2017	pptc_2019
cscd_hgsc_bcm_2014	mixed_allen_2018	prad_msk_stopsack_2021
cscd_ranson_2022	mixed_cfdna_msk_2020	prostate_msk_2024
cscd_ucsf_2021	mixed_impact_subset_2022	ptad_msk_2024
csf_msk_2024	mixed_kunga_msk_2022	rbl_cfdna_msk_2020
difg_glass	mixed_pipseq_2017	rms_nih_2014
difg_glass_2019	mng_utoronto_2021	sarc_mskcc
difg_msk_2023	mpnst_mskcc	sarc_tcga
egc_msk_2023	msk_access_2021	sarc_tcga_pan_can_atlas_2018
es_dfarber_broad_2014	msk_ch_2020	sarcoma_msk_2022
es_dsrtc_msk_2023	msk_ch_2023	sarcoma_msk_2023
es_iocurie_2014	msk_ch_ped_2021	sarcoma_msk_2026
gbc_msk_2018	msk_chord_2024	
gbc_shanghai_2014	msk_ctdna_vte_2024	
gbm_columbia_2019	msk_impact_2017	
gbm_cptac_2021	msk_met_2021	
gbm_tcga_gdc	nbl_amc_2012	
gbm_tcga_pan_can_atlas_2018	nbl_broad_2013	
gbm_tcga_pub	nbl_msk_2023	
gbm_tcga_pub2013	nbl_target_2018_pub	
gist_msk_2022	nbl_target_gdc	
gist_msk_2023	nbl_ucologne_2015	

glist_msk_2025	nccrcc_genentech_2014
glioma_msk_2018	nsclc_ctdx_msk_2022

Supplementary Table 3. Patient characteristics

		N	%
Age, mean (SD)	Mean (SD)	42.37 (24.14)	
	Non-missing	21070	49.5
	NA	21499	50.5
Gender	female	14460	34.0
	male	16082	37.8
	NA	12027	28.3
Classification system	Breast	113	0.3
	CUP	2927	6.9
	Digestive system	4203	9.9
	Endocrine system	317	0.7
	Head and neck/Eye	1984	4.7
	Lung	131	0.3
	Mesothelioma	970	2.3
	Neural system	11763	27.6
	Neuroendocrine system	1125	2.6
	NUT	1	<0.1
	Reproductive system	328	0.8
	Skin	909	2.1
	Soft tissue/Bone	16896	39.7
	Thymus	343	0.8
	Urinary system	559	1.3
Specimen source	CSF	38	0.1
	ctDNA	214	0.5
	Peritoneal effusion	400	0.9
	Pleural effusion	5	<0.1
	Tumor tissue	21516	50.5
	NA	20396	47.9

Supplementary Table 4. The top mutated gene(s), predominant alteration, and matched intervention(s) of each classification system

Classification system	Top mutated gene(s)	Predominant alteration	Matched intervention(s) *the listed intervention(s) may not match the predominant alteration shown; please check the CCBM knowledgebase for the exact matching interventions.
Breast	<i>FGFR1</i> (4%)	Amplification (75%)	Erdafitinib, Pemigatinib (for fusions)
Breast	<i>BRAF</i> (3%)	/	Dabrafenib, Trametinib (for Non-V600X), Selumetinib, Vemurafenib
Breast	<i>NBN</i> (3%)	Amplification (67%)	Camonsertib, Talazoparib
CUP	<i>BRAF</i> (1%)	V600E (81%)	Dabrafenib, Trametinib (for Non-V600X), Selumetinib, Vemurafenib
CUP	<i>KRAS</i> (3%)	G12X (81%)	Adagrasib (for G12C), Avutometinib, BBO-11818, BBO-8520 (for G12C), Daraxonrasib, and etc.
CUP	<i>PIK3CA</i> (1%)	H1047R (36%)	Alpelisib, Capivasertib, ETX-636, Inavolisib, TER-2013, WXFL10030390
Digestive system	<i>ERBB2</i> (2%)	Amplification (70%)	Lapatinib, Neratinib, Pertuzumab, Trastuzumab, Poziotinib, and etc.
Digestive system	<i>IDH1</i> (6%)	R132X (100%)	Ivosidenib, Olutasidenib, Venetoclax, Vorasidenib
Digestive system	<i>KRAS</i> (10%)	G12X (81%)	Adagrasib (for G12C), Avutometinib, BBO-11818, BBO-8520 (for G12C), Daraxonrasib, and etc.
Endocrine system	<i>RET</i> (6%)	M918T (67%)	Cabozantinib (for fusions), Pralsetinib, Selpercatinib, Sunitinib (for amplification), Vandetanib (for fusions)

Endocrine system	<i>CTNNB1</i> (6%)	S45X (53%)	Vismodegib
Head and neck/Eye	<i>ATM</i> (2%)	R337C (22%)	Camonsertib, Olaparib, Rucaparib, Talazoparib
Head and neck/Eye	<i>BRCA2</i> (1%)	K3326* (25%)	Camonsertib, ETX-19477, Fluzoparib, Niraparib, Olaparib
Head and neck/Eye	<i>PIK3CA</i> (2%)	H1047R (32%)	Alpelisib, Capivasertib, ETX-636, Inavolisib, TER-2013, WXFL10030390
Lung	<i>FGFR1</i> (3%)	Amplification (50%)	Erdaftinib, Pemigatinib (for fusions)
Lung	<i>KRAS</i> (9%)	G12X (100%)	Adagrasib (for G12C), Avutometinib, BBO-11818, BBO-8520 (for G12C), Daraxonrasib, and etc.
Mesothelioma	<i>ATM</i> (1%)	/	Camonsertib, Olaparib, Rucaparib, Talazoparib
Mesothelioma	<i>SETD2</i> (3%)	/	Camonsertib
Neural system	<i>EGFR</i> (4%)	Amplification (54%)	Afatinib/Aumolertinib/Befotertinib... (for activating mutations), Amivantamab/Andamertinib... (for exon 20 insertions), and etc.
Neural system	<i>IDH1</i> (8%)	R132X (99%)	Ivosidenib, Olutasidenib, Venetoclax, Vorasidenib
Neural system	<i>NFI</i> (2%)	/	Selumetinib
Neuroendocrine system	<i>KRAS</i> (3%)	G12X (82%)	Adagrasib (for G12C), Avutometinib, BBO-11818, BBO-8520 (for G12C), Daraxonrasib, and etc.
Neuroendocrine system	<i>SETD2</i> (2%)	/	Camonsertib
Neuroendocrine system	<i>TSC2</i> (2%)	/	Nab-sirolimus

Reproductive system	<i>KRAS</i> (9%)	G12X (97%)	Adagrasib (for G12C), Avutometinib, BBO-11818, BBO-8520 (for G12C), Daraxonrasib, and etc.
Reproductive system	<i>PIK3CA</i> (14%)	H1047R (27%)	Alpelisib, Capivasertib, ETX-636, Inavolisib, TER-2013, WXFL10030390
Skin	<i>ATM</i> (< 1%)	R3008H (50%)	Camonsertib, Olaparib, Rucaparib, Talazoparib
Skin	<i>HRAS</i> (< 1%)	/	Tipifarnib
Skin	<i>ROS1</i> (<1%)	T1177M (40%)	Cabozantinib, Crizotinib/Entrectinib/Repotrectinib... (for fusions), Lorlatinib, and etc.
Soft tissue/Bone	<i>CDK4</i> (2%)	Amplification (100%)	Palbociclib (for amplification)
Soft tissue/Bone	<i>KIT</i> (3%)	W557X (22%)	Avapritinib (for exon 17 mutations), Dasatinib, Imatinib, Nilotinib, Ponatinib (for exon 11 mutations), and etc.
Soft tissue/Bone	<i>PIK3CA</i> (2%)	H1047R (22%)	Alpelisib, Capivasertib, ETX-636, Inavolisib, TER-2013, WXFL10030390
Thymus	<i>HRAS</i> (2%)	/	Tipifarnib
Thymus	<i>KIT</i> (1%)	V559X (50%)	Avapritinib (for exon 17 mutations), Dasatinib, Imatinib, Nilotinib, Ponatinib (for exon 11 mutations), and etc.
Urinary system	<i>SETD2</i> (3%)	/	Camonsertib
Urinary system	<i>SMARCA4</i> (3%)	/	PRT3789