

Supplementary Tables 1 – 4

Supplementary Table S1. Clinical samples treated with ICI

sample ID	Treating Center	Tumor Type	Data type	ICI
R_16_00151	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00152	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00153	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00154	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00382	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00383	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00384	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00385	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00386	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00442	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00387	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00389	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00390	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_16_00391	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00819	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00011	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00012	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00013	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00015	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00016	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00017	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00018	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00019	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00020	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00290	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00022	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00023	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00029	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00031	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00032	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00033	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00036	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00035	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00037	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00038	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00394	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00393	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00396	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00397	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00395	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00398	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab

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R_17_00400	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00401	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
R_17_00402	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pembrolizumab
tdx702	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
tdx015	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
tdx1630	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
tdx3300	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
tdx4783	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
tdx6387	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
tdx1936	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
tdx2111	Roche	Gastric Cancer	RNA-Seq	Atezolizumab
NUH004	National University Hospital	Gastric Cancer	RNA-Seq	Nivolumab + IMP*
S02	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S03	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S04	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S05	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S06	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S08	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S10	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S11	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S12	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S17	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S18	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S20	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S21	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S22	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S23	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S24	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S25	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S26	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S28	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S29	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S30	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S31	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S32	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S33	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S34	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S35	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S36	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S37	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S38	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S39	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S40	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S41	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S47	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S48	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab

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S49	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S50	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S51	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S52	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S53	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
S54	Samsung Medical Centre	Hepatocellular Carcinoma	RNA-Seq	Pembrolizumab
RHT5353	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5355	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5358	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5359	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5364	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5370	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5489	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5491	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5493	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5495	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5497	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5499	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5501	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5503	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5505	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5507	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5509	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5923	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5925	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5927	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5929	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5931	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5933	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5936	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5937	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5938	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5939	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
RHT5940	National Cancer Centre	Hepatocellular Carcinoma	RNA-Seq	Nivolumab + IMP
J02	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Nivolumab
J04	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Nivolumab + IMP
J05	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Nivolumab
J08	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Nivolumab
J09	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Nivolumab
J10	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Durvalumab + IMP
J12	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Nivolumab
J13	National Cancer Centre	Hepatocellular Carcinoma	NanoString	Nivolumab
M01	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M03	University of Milan	Gastric Cancer	NanoString	Nivolumab + IMP
M04	University of Milan	Gastric Cancer	NanoString	Ipilimumab
M06	University of Milan	Gastric Cancer	NanoString	Nivolumab + IMP

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M07	University of Milan	Gastric Cancer	NanoString	Nivolumab + IMP
M10	University of Milan	Gastric Cancer	NanoString	Nivolumab + IMP
M11	University of Milan	Gastric Cancer	NanoString	Pembrolizumab
M12	University of Milan	Gastric Cancer	NanoString	Pembrolizumab
M13	University of Milan	Cholangiocarcinoma	NanoString	Pembrolizumab
M14	University of Milan	Colorectal Cancer	NanoString	Novel PD-1
M15	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M16	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M17	University of Milan	Anal Squamous Cancer	NanoString	Avelumab + IMP
M18	University of Milan	Anal Squamous Cancer	NanoString	Avelumab + IMP
M19	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M22	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M23	University of Milan	Esophageal Squamous Cancer	NanoString	Nivolumab + IMP
M24	University of Milan	Esophageal Squamous Cancer	NanoString	Nivolumab + IMP
M25	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M26	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M27	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M28	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M29	University of Milan	Esophageal Squamous Cancer	NanoString	Nivolumab
M30	University of Milan	Anal Squamous Cancer	NanoString	Avelumab
M31	University of Milan	Esophageal Squamous Cancer	NanoString	Nivolumab + IMP
M33	University of Milan	Anal Squamous Cancer	NanoString	Avelumab + IMP
M34	University of Milan	Anal Squamous Cancer	NanoString	Avelumab + IMP
ACC_10	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_11	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_12	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_13	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_14	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_15	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_16	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_17	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_18	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_2	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_20	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_21	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_22	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_24	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_25	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_26	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_27	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_28	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_29	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_30	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_31	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_32	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_33	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab

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ACC_34	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_35	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_36	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_37	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_38	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_39	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_4	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_40	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_41	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_42	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_43	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_44	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_46	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_47	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_48	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_49	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_5	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_6	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_7	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_8	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
ACC_9	Aichi Cancer Center	Gastric Cancer	NanoString	Nivolumab
mGC_INT31	University of Milan	Gastric Cancer	NanoString	Pembrolizumab
mGC_INT32	University of Milan	Gastric Cancer	NanoString	Pembrolizumab
mGC_INT33	University of Milan	Gastric Cancer	NanoString	Pembrolizumab
mGC_INT34_1	University of Milan	Gastric Cancer	NanoString	Pembrolizumab
mGC_INT35	University of Milan	Gastric Cancer	NanoString	Pembrolizumab
mGC_INT36	University of Milan	Gastric Cancer	NanoString	Nivolumab
YCC.S07	Yonsei Cancer Centre	Gastric Cancer	NanoString	Nivolumab + IMP
YCC.S11	Yonsei Cancer Centre	Gastric Cancer	NanoString	Novel PD-1
YCC.S16	Yonsei Cancer Centre	Gastric Cancer	NanoString	Pembrolizumab + IMP
RAM-E01	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram*
RAM-E02	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E04	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E05	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E06	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E07	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E08	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E10	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E11	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E12	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E13	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E15	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E16	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E17	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E19	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E20	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram

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RAM-E21	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E22	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E23	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E24	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E25	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E26	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E28	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E29	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E30	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E31	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E32	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E33	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E35	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E37	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E39	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E41	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E42	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E43	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E44	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E45	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E46	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E47	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E49	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E50	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E51	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E53	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E55	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E56	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E57	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E58	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
RAM-E59	Samsung Medical Centre	Gastric Cancer	RNA-Seq	Pac + Ram
NCC026	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX(Chemotherapy)*
S-011	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-021	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH009	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NCC018	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-038	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)*
S-008	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH014	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NCC022	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-072	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-036	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-035	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NUH006	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-044	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-071	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)

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S-074	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH008	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-012	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-063	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-047	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NUH020	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-003	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-005	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NUH012	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NCC025	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-037	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-041	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-007	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-015	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NUH017	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH010	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH019	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-065	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-046	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NCC003	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-048	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-004	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-031	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NCC020	National Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-030	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH016	National University Hospital	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-024	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NUH003	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH027	National University Hospital	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-027	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NCC021	National Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NCC014	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-050	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NCC010	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH004	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
NUH021	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-042	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NUH005	National University Hospital	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-034	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NCC001	National Cancer Centre	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-006	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-078	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
NUH002	National University Hospital	Gastric Cancer	RNA-Seq	SOX (Chemotherapy)
S-045	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)
S-075	Yonsei Cancer Centre	Gastric Cancer	RNA-Seq	SP (Chemotherapy)

IMP = investigational medicinal product; Pac + Ram = paclitaxel + ramucirumab; SOX = S-1 + oxaliplatin, SP = S-1 + cisplatin

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Supplementary Table S2. Clinical and histopathological characteristics of samples included for single-cell RNA-Seq

Sample ID	Stage	TNM	APB Group	No. of Cells	Lauren	WHO Classification	Histological Grade	Tumor location	Linitis Plastica	TCGA subtype	Known Driver Mutation	Known Driver Amplification
GCSCRNASEQ508	IIIC	T4N3	int	7380	Intestinal	Tubular carcinoma	Moderately differentiated	gastric cardia	No	GS	TP53, FBXW7	CCNE1
GCSCRNASEQ502	IIIC	T4N3	high	7276	Intestinal	Tubular carcinoma	Moderately differentiated	gastric cardia	No	GS	TP53, PIK3CA	
GCSCRNASEQ511	IIB	T3N1	low	13626	Intestinal	Tubular carcinoma	Moderate to poorly differentiated	gastric antrum	No	MSI	PIK3CA, CDKN2A	CCND1
GCSCRNASEQ498	IIA	T3N0	high	6859	Intestinal	Tubular carcinoma	Moderately to poorly differentiated	gastric antrum	No	GS		
GCSCRNASEQ512	IIIA	T3N2	high	2681	Intestinal	Tubular carcinoma	Well differentiated	Gastric antrum	No	CIN		
GCSCRNASEQ514	IIIB	T4N3	int	2597	Diffuse	Poorly cohesive	NA	Gastric body/antrum	No			
GCSCRNASEQ518	IIA	T3N0	low	2769	mixed	tubular and poorly cohesive	Poorly differentiated	Gastric antrum	No	MSI	KRAS,TP53	JAK2/CD274
GCSCRNASEQ519	IIIC	T4N3	low	3525	Diffuse	Poorly cohesive	Poorly differentiated		yes	CIN	TP53, ERBB2,	
GCSCRNASEQ521	IIA	T3N0	int	2097	Intestinal	Tubular	Moderately differentiated	Gastric antrum	No	GS	TP53	
GCSCRNASEQ522	IIB	T1N3	int	3593	Intestinal	Tubular	Poorly differentiated	Gastric body/antrum	No	GS	TP53	
GCSCRNASEQ525	IIB	T2N2	int	2668	mixed	Mixed	Poorly differentiated	Gastric antrum	No	CIN	TP53	KRAS,GATA4

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Supplementary Table S3. Tumor microenvironment cellular composition based on APB group.

Cell Type	APB _{low}		APB _{int}		APB _{high}		p-val*
	(%)	n	(%)	n	(%)	n	
T-cells	42	8307	24	4390	36	6132	<0.0001
Epithelial cells	13	2689	21	3919	20	3329	<0.0001
B-cells	14	2771	12	2222	16	2694	0.82
Macrophage	10	2082	18	3210	5	740	0.0045
Endothelial	4	761	2	411	3	537	<0.0001
Fibroblast	5	1014	15	2816	8	1396	<0.0001
Others	12	2296	8	1367	12	1988	<0.0001
Total	100	19920	100	18335	100	16816	

Fisher-exact test p-value of APB_{low} vs APB_{int}/APB_{high}

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Supplementary Table S4. Details of gastric cancer cell lines used in humanized-mouse experiment

Cell Line	Source	Culture medium	Anchorage Properties
SNU1750	Korean Cell Line Bank	RPMI 1640 + 10% FBS + 1% Pen Strep + 1% NEAA	Adherent
GSU	Riken Gene Bank	RPMI 1640 + 10% FBS + 1% Pen Strep + 1% NEAA	Adherent
SNU16	American Type Culture Collection (ATCC)	RPMI 1640 + 10% FBS + 1% Pen Strep + 1% NEAA	Suspension
YCC21	Yonsei University College of Medicine, Seoul	MEM + 10% FBS + 1% Pen Strep + 1% NEAA	Adherent
NCC59	Korean Cell Line Bank	RPMI 1640 + 10% FBS + 1% Pen Strep + 1% NEAA	Semi-adherent

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Supplementary Table S5. Gastric cancer immunotherapy treated cohort patient characteristics

	Total n = 53	n (%)
Age (median, years)		57, range (26 to 78)
Gender	Male	40 (75%)
	Female	13 (25%)
Histological Grade*	Well/moderately differentiated	13 (24%)
	Poorly differentiated	22 (42%)
	Signet ring/others	18 (34%)
TCGA subtype*	MSI	5 (9%)
	EBV	4 (8%)
	CIN	15 (28%)
	GS	20 (38%)
PD-L1 Immunohistochemistry* (CPS score)	0	18 (34%)
	1 – 9	13 (25%)
	10 and higher	9 (17%)

* data not available for all samples

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Supplementary Table S6. Comparison of *CD8A*, *GZMA* and *PRF1* gene expression between APB_{high} and APB_{low} by tumor type (Wilcoxon rank-sum test p values listed).

Tumor Type	n	CD8A	GZMA	PRF1
ACC	79	0.4415	0.4521	0.1105
BLCA	411	8.75E-07	0.0001015	1.29E-05
BRCA	1114	2.20E-16	1.61E-12	3.60E-13
CESC	306	0.02412	0.3701	0.002608
CHOL	36	0.1383	0.2707	0.1852
Colorectal	640	1.07E-13	2.87E-09	2.87E-09
ESCA	185	3.35E-05	0.0002458	0.0001687
Glioma	701	8.49E-05	2.20E-16	2.20E-16
HNSC	504	2.61E-09	0.01079	2.39E-07
Kidney	895	2.20E-16	2.20E-16	2.20E-16
LIHC	374	0.025	0.9693	0.4908
LUAD	530	0.003628	0.09362	3.81E-05
LUSC	501	2.85E-09	2.72E-06	4.40E-12
MESO	87	0.0003025	0.04914	0.003159
OV	430	5.16E-08	3.69E-11	2.44E-14
PAAD	179	0.001276	0.07577	0.04434
PCPG	184	0.05846	0.02063	5.16E-06
PRAD	502	8.09E-06	0.04175	3.63E-05
SARC	263	5.13E-05	0.0102	6.57E-06
SKCM	472	2.20E-16	2.20E-16	2.20E-16
STAD	416	0.00028	3.88E-06	3.08E-06
TGCT	156	0.0003038	0.222	4.87E-05
THCA	513	8.95E-07	3.00E-04	1.26E-05
UCEC	550	0.001857	0.09517	6.32E-07
UCS	57	0.03452	0.04693	0.02781
UVM	80	0.06667	0.2302	0.4255

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