

Supplemental Table 1
CyTOF antibody panel

Catalog Number	Metal Tag	Marker	Clone	Dilution	Source
3141019B	141Pr	CD3	UCHT1	1:200	Fluidigm
3142001B	142Nd	CD19	HIB19	1:300	Fluidigm
3144019B	144Nd	CD15 (SSEA-1)	W6D3	1:400	Fluidigm
3145010B	145Nd	CD163	GHI/61	1:100	Fluidigm
3146006B	146Nd	CD64	10.1	1:100	Fluidigm
3148004B	148Nd	CD16	3G8	1:400	Fluidigm
3151002B	151Eu	CD107a (LAMP1)	H4A3	1:100	Fluidigm
3152011B	152Sm	CD66b	80H3	1:200	Fluidigm
3153023B	153Eu	CD192 (CCR2)	K036C2	1:200	Fluidigm
3154016B	154Sm	TIGIT	MBSA43	1:100	Fluidigm
3155009B	155Gd	CD279 (PD-1)	EH12.2H7	1:100	Fluidigm
3156026B	156Gd	CD274 (PD-L1)	29E.2A3	1:100	Fluidigm
3162015B	162Dy	CD8a	RPA-T8	1:200	Fluidigm
3163023B	163Dy	CD33	WM53	1:200	Fluidigm
3165011B	165Ho	CD45RO	UCHL1	1:200	Fluidigm
3166012B	166Er	CD34	581	1:100	Fluidigm
201167A	167Er	CD45RA	HI100	1:100	Fluidigm
3168008B	168Er	CD206 (MMR)	15-2	1:100	Fluidigm
3169003B	169Tm	CD25 (IL-2R)	2A3	1:100	Fluidigm
3170005B	170Er	CD152 (CTLA-4)	14D3	1:100	Fluidigm
3171011B	171Yb	CD68	Y1/82A	1:100	Fluidigm
3172014B	172Yb	CD273 (PD-L2)	24F.10C12	1:100	Fluidigm
3173005B	173Yb	HLA-DR	L243	1:400	Fluidigm
3175015B	175Lu	CD14	M5E2	1:100	Fluidigm
3176010B	176Yb	CD4	RPA-T4	1:100	Fluidigm
3209003B	209Bi	CD11b (Mac-1)	ICRF44	1:200	Fluidigm
3089003B	89Y	CD45	HI30	1:200	Fluidigm
3150030B	150Nd	LAG3	11C3C65	1:100	Fluidigm
3160020B	160Gd	CD23	EBVCS-5	1:100	Fluidigm
3149021B	149Sm	CD56 (NCAM)	NCAM16.2	1:100	Fluidigm

Supplemental Table 3A

PRIMARY ANTIBODY	COMPANY-CATALOGUE NUMBER	CONCENTRATION	SECONDARY ANTIBODY	COMPANY-CATALOGUE NUMBER	OPAL TSA™ FLUOROPHORE
CD8	SpringBio-M5390	1:400	Opal Polymer®	ARH1A01EA	570
CD3	Dako-A0452	1:400	Opal Polymer®	ARH1A01EA	520
CD163	Leica-NCL-L-CD163	1:400	Opal Polymer®	ARH1A01EA	650
PD-L1	CST-13684	1:200	Opal Polymer®	ARH1A01EA	540
Pancytokeratin	Dako-M3515	1:500	Opal Polymer®	ARH1A01EA	690
FOXP3	CST-12653	1:400	Opal Polymer®	ARH1A01EA	620

Supplemental Table 3B

COMPLEX PHENOTYPES FOR CHRONIC PANCREATITIS	BASIC PHENOTYPE (inForm[®])	MEAN FLUORESCENT INTENSITY (MFI)	CELL SEGMENT OF MFI	POSITIVE OR NEGATIVE MFI
Tumor epithelial cell (TC)	Epithelial cell	N/A	N/A	N/A
PD-L1+ TC	Epithelial cell	PD-L1 (5 mfi)	Membrane	Positive
PD-L1- TC	Epithelial cell	PD-L1 (5 mfi)	Membrane	Negative
Antigen presenting cell (APC)	APC	N/A	N/A	N/A
PD-L1+ APC	APC	PD-L1 (5 mfi)	Membrane	Positive
PD-L1- APC	APC	PD-L1 (5 mfi)	Membrane	Negative
T _{regulatory} cell (T _{reg})	Tcell	FOXP3 (4.75 mfi) CD8 (3 mfi)	Nucleus Cytoplasm	Positive Negative
Cytotoxic Tcell (CTL)	Tcell	CD8 (3 mfi)	Cytoplasm	Positive
T _{helper} cell (Th)	Tcell	CD8 (3 mfi) FOXP3 (4.75 mfi)	Cytoplasm Nucleus	Negative Negative

Supplemental Table 3C

COMPLEX PHENOTYPES FOR PDASAMPLES	BASIC PHENOTYPE (inForm[®])	MEAN FLUORESCENT INTENSITY (MFI)	CELL SEGMENT OF MFI	POSITIVE OR NEGATIVE MFI
Tumor epithelial cell (TC)	Epithelial cell	N/A	N/A	N/A
PD-L1+ TC	Epithelial cell	PD-L1 (2 mfi)	Membrane	Positive
PD-L1- TC	Epithelial cell	PD-L1 (2 mfi)	Membrane	Negative
Antigen presenting cell (APC)	APC	N/A	N/A	N/A
PD-L1+ APC	APC	PD-L1 (2 mfi)	Membrane	Positive
PD-L1- APC	APC	PD-L1 (2 mfi)	Membrane	Negative
T _{regulatory} cell (T _{reg})	Tcell	FOXP3 (2 mfi) CD8 (3 mfi)	Nucleus Cytoplasm	Positive Negative
Cytotoxic Tcell (CTL)	Tcell	CD8 (3 mfi)	Cytoplasm	Positive
T _{helper} cell (Th)	Tcell	CD8 (3 mfi) FOXP3 (2 mfi)	Cytoplasm Nucleus	Negative Negative

Supplemental Table 4

Marker	Clone	Dilution	Source	Catalog Number
PVR/CD155	D8A5G	1:100	Cell Signaling Technology	Cat# 81254S
Recombinant Anti-TIGIT antibody	BLR047F	1:100	Abcam	Cat# ab243903
CD8 α	C8/144B	1:100	Cell Signaling Technology	Cat# 70306S
Anti-human CD163	10D6	1:100	Novus Biologicals	Cat# NB110-59935SS
Pan Cytokeratin Monoclonal Antibody, Alexa Fluor 488	AE1/AE3	1:250	Thermo Fisher Scientific	Cat# 53-9003-82
FoxP3	D6O8R	1:100	Cell Signaling Technology	Cat# 12653S
Vimentin XP $\text{\textcircled{R}}$	D21H3	1:100	Cell Signaling Technology	Cat# 5741S
VE- Cadherin/CD144	123413	1:250	R&D	#MAB9381

Supplemental Table 5

Literature Supported Receptor Ligand Pairs

Ligand.ApprovedSymbol	Receptor.ApprovedSymbol
APOB	LDLR
APOE	LDLR
APOE	LRP5
APOE	LRP8
APOE	SORL1
APOE	VLDLR
CCL11	ACKR2
CCL11	CCR2
CCL11	CCR3
CCL11	CCR5
CCL11	CXCR3
CCL13	ACKR2
CCL13	CCR1
CCL13	CCR2
CCL13	CCR3
CCL13	CCR5
CCL13	CXCR3
CCL14	ACKR2
CCL14	CCR1
CCL14	CCR5
CCL15	CCR1
CCL15	CCR3
CCL16	CCR1
CCL16	CCR2
CCL16	CCR5
CCL16	HRH4
CCL17	CCR4
CCL17	CCR8
CCL19	ACKR4

CCL19	CCR7
CCL19	CCRL2
CCL19	CXCR3
CCL1	CCR8
CCL20	CCR6
CCL20	CXCR3
CCL21	ACKR4
CCL21	CCR7
CCL21	CXCR3
CCL22	CCR4
CCL23	CCR1
CCL24	CCR2
CCL24	CCR3
CCL25	ACKR4
CCL25	CCR9
CCL26	CCR2
CCL26	CCR3
CCL27	CCR10
CCL28	CCR10
CCL28	CCR3
CCL2	ACKR2
CCL2	CCR1
CCL2	CCR2
CCL2	CCR3
CCL2	CCR4
CCL2	CCR5
CCL2	DARC
CCL3	CCR1
CCL3	CCR5
CCL4	ACKR2
CCL4	CCR1
CCL4	CCR5

CCL4	CCR8
CCL5	ACKR2
CCL5	CCR1
CCL5	CCR3
CCL5	CCR4
CCL5	CCR5
CCL5	CXCR3
CCL5	DARC
CCL5	GPR75
CCL7	ACKR2
CCL7	CCR1
CCL7	CCR2
CCL7	CCR3
CCL7	CCR5
CCL7	CXCR3
CCL8	ACKR2
CCL8	CCR1
CCL8	CCR2
CCL8	CCR3
CCL8	CCR5
CD24	SELP
CD34	SELL
CD40LG	CD40
CD55	CD97
CD70	CD27
CX3CL1	CX3CR1
CXCL10	CCR3
CXCL10	CXCR3
CXCL11	ACKR3
CXCL11	CCR3
CXCL11	CXCR3
CXCL12	ACKR3

CXCL12	CXCR3
CXCL12	CXCR4
CXCL13	CXCR5
CXCL16	CXCR6
CXCL1	CXCR1
CXCL1	CXCR2
CXCL1	DARC
CXCL2	CXCR1
CXCL2	CXCR2
CXCL2	XCR1
CXCL3	CXCR1
CXCL3	CXCR2
CXCL5	CXCR1
CXCL5	CXCR2
CXCL6	CXCR1
CXCL6	CXCR2
CXCL9	CCR3
CXCL9	CXCR3
GZMB	IGF2R
HLA-A	KIR3DL2
HLA-B	KIR3DL1
HLA-C	KIR2DL1
HLA-C	KIR2DL3
HLA-C	KIR2DS4
HLA-E	KLRC1
HLA-E	KLRC2
HLA-E	KLRD1
HLA-G	KIR2DL4
HLA-G	KLRC1
HLA-G	KLRD1
HLA-G	LILRB1
IFNG	IFNGR1

IFNG	IFNGR2
IL10	IL10RA
IL10	IL10RB
IL11	IL11RA
IL11	IL6ST
IL12A	IL12RB1
IL12A	IL12RB2
IL12B	IL12RB1
IL12B	IL12RB2
IL13	IL13RA1
IL13	IL13RA2
IL13	IL2RG
IL13	IL4R
IL15	IL15RA
IL15	IL2RB
IL15	IL2RG
IL16	CD4
IL17A	IL17RA
IL17B	IL17RB
IL18	IL18R1
IL18	IL18RAP
IL18	IL1RAPL1
IL19	IL20RA
IL19	IL20RB
IL1A	IL1R1
IL1A	IL1R2
IL1B	IL1R1
IL1B	IL1R2
IL1B	IL1RAP
IL1RN	IL1R1
IL1RN	IL1R2
IL20	IL20RA

IL20	IL20RB
IL20	IL22RA1
IL21	IL21R
IL21	IL2RG
IL22	IL10RA
IL22	IL22RA1
IL22	IL22RA2
IL23A	IL12RB1
IL23A	IL23R
IL24	IL20RA
IL24	IL20RB
IL24	IL22RA1
IL25	IL17RB
IL2	IL2RA
IL2	IL2RB
IL2	IL2RG
IL31	IL31RA
IL31	OSMR
IL3	CSF2RB
IL3	IL3RA
IL4	IL13RA1
IL4	IL2RG
IL4	IL4R
IL5	CSF2RB
IL5	IL5RA
IL6	IL6R
IL6	IL6ST
IL7	IL2RG
IL7	IL7R
IL8	CXCR1
IL8	CXCR2
IL8	DARC

IL9	IL2RG
IL9	IL9R
CCL11	ACKR4
CCL13	ACKR4
CCL14	CCR3
CCL16	CCR8
CCL17	DARC
CCL18	C14orf1
CCL19	ACKR2
CCL19	CCR10
CCL21	ACKR2
CCL25	ACKR2
CCL25	CCR10
CCL26	CCR1
CCL27	ACKR2
CCL28	ACKR2
CCL2	ACKR4
CCL2	CCR10
CCL3L1	CCR1
CCL3L1	CCR3
CCL3L1	CCR5
CCL3L3	ACKR2
CCL3L3	CCR5
CCL3	ACKR2
CCL3	CCR3
CCL3	CCR4
CCL4	CCR3
CCL5	ACKR4
CCL5	SDC1
CCL5	SDC4
CCL7	ACKR4
CCL7	CCR10

CCL7	DARC
CCL8	ACKR4
CCL8	DARC
CD14	ITGA4
CD14	ITGB1
CD55	CR1
CD5L	CD5
CXCL10	SDC4
CXCL12	CD4
CXCL12	ITGB1
CXCL13	ACKR4
CXCL13	CCR10
CXCL13	CXCR3
CXCL5	DARC
HLA-A	APLP2
HLA-A	ERBB2
HLA-A	KIR3DL1
HLA-A	LILRB1
HLA-A	LILRB2
HLA-B	CANX
HLA-B	KLRD1
HLA-B	LILRB1
HLA-B	LILRB2
HLA-C	LILRA3
HLA-C	LILRB1
HLA-C	LILRB2
HLA-G	LILRB2
IL12A	CD28
IL12B	IL23R
IL15	IL2RA
IL16	GRIN2C
IL16	GRIN2D

IL16	KCNA3
IL16	KCND1
IL16	KCND2
IL16	KCNJ10
IL16	KCNJ15
IL16	KCNJ4
IL17A	IL17RC
IL17F	IL17RA
IL18	IL1RL2
IL1A	IL1RAP
IL1B	ADRB2
IL1F10	IL1R1
IL22	IL10RB
IL27	IL27RA
IL2	CD53
IL2	NGFR
IL34	CSF1R
IL4	CD53
IL4	IL13RA2
IL8	SDC1
IL8	SDC2
CD274	PDCD1
CD80	CTLA4
LGALS9	HAVCR2
PVR	TIGIT
HLA-DQA1	LAG3
TNFRSF14	BTLA
ADORA1	ADORA2A
CD80	CD28
ICOSLG	ICOS
TNFSF9	TNFRSF9
TNFSF4	TNFRSF4

TNFSF18	TNFRSF18
CD47	SIRPA
CSF1	CSF1R

Flow Repository Key- PBMC

Supplemental Table 6

FCS File	ID	Disease State
20191209_PBMC_CP.fcs	20191209	Chronic Pancreatitis
20191219_PBMC_CP.fcs	20191219	Chronic Pancreatitis
20191226_PBMC_CP.fcs	20191226	Chronic Pancreatitis
20191228_PBMC_CP.fcs	20191228	Chronic Pancreatitis
20191230_PBMC_CP.fcs	20191230	Chronic Pancreatitis
20191237_PBMC_CP.fcs	20191237	Chronic Pancreatitis
20191244_PBMC_CP.fcs	20191244	Chronic Pancreatitis
20191249_PBMC_CP.fcs	20191249	Chronic Pancreatitis
20191196_PBMC_H.fcs	20191196	Duodenal Adenoma (Healthy)
20191235_PBMC_DA.fcs	20191235	Duodenal Adenoma (Healthy)
8839995_H_PBMC.fcs	8839995	Healthy
8839996_PBMC_H.fcs	8839996	Healthy
8839999_H_PBMC_0.fcs	8839999	Healthy
20191194_PBMC_H.fcs	20191194	Healthy
20191195_PBMC_H.fcs	20191195	Healthy
20191203_PBMC_H.fcs	20191203	Healthy
20191205_PBMC_H.fcs	20191205	Healthy
20191206_PBMC_H.fcs	20191206	Healthy
20191211_PBMC_H.fcs	20191211	Healthy
20191212_PBMC_H.fcs	20191212	Healthy
20191232_PBMC_H.fcs	20191232	Healthy
20191233_PBMC_H.fcs	20191233	Healthy
20191234_PBMC_H.fcs	20191234	Healthy
20191236_PBMC_CP.fcs	20191236	Healthy
20191247_PBMC_CP.fcs	20191247	Healthy
20191257_PBMC_H.fcs	20191257	Healthy
20160882_PBMC_PDAC.fcs	20160882	PDAC
20160882_PBMct2_PDAC.fcs	20160882	PDAC
20160897_PBMC_PDAC.fcs	20160897	PDAC
20171027_PBMC_PDAC.fcs	20171027	PDAC
20171040_PBMC_PDAC.fcs	20171040	PDAC
20171064_PBMC_PDAC.fcs	20171064	PDAC
20171085_PBMC_PDAC.fcs	20171085	PDAC
20181107_PBMC_PDAC.fcs	20181107	PDAC
20181121_PBMC_PDAC.fcs	20181121	PDAC
20181129_PBMC_PDAC.fcs	20181129	PDAC
20181157_PBMC_PDAC.fcs	20181157	PDAC
20191172_PBMC_PDAC.fcs	20191172	PDAC
20191176_PBMct1_PDAC.fcs	20191176	PDAC
20191176_PBMct2_PDAC.fcs	20191176	PDAC
20191180_PBMC_PDAC.fcs	20191180	PDAC
20191198_PBMC_PDAC.fcs	20191198	PDAC
20191201_PBMC_PDAC.fcs	20191201	PDAC
20191202_PBMC_PDAC.fcs	20191202	PDAC
20191204_PBMC_PDAC.fcs	20191204	PDAC
20191207_PBMC_PDAC.fcs	20191207	PDAC
20191210_PBMC_PDAC.fcs	20191210	PDAC

Flow Repository Key- PBMC

Supplemental Table 6

20191214_PBMC_PDAC.fcs	20191214	PDAC
20191215_PBMC_PDAC.fcs	20191215	PDAC
20191216_PBMC_PDAC.fcs	20191216	PDAC
20191221_PBMC_PDAC.fcs	20191221	PDAC
20191222_PBMC_PDAC.fcs	20191222	PDAC
20191222_PBMct2_PDAC.fcs	20191222	PDAC
20191229_PBMC_T2_PDAC.fcs	20191229t2	PDAC
20191243_PBMC_PDAC.fcs	20191243	PDAC
20191245_PBMC_PDAC.fcs	20191245	PDAC
20191246_PBMct1_PDAC.fcs	20191246	PDAC
61353210_PBMC_PDAC.fcs	61353210	PDAC
61354860_PBMC_PDAC.fcs	61354860	PDAC
20191229_PBMC_PDAC.fcs	20191229 (6750)	PDAC
20191238_PBMct1_PDAC.fcs	20191238t1	PDAC
20191238_PBMct2_PDAC.fcs	20191238t2	PDAC

Flow Repository Key- Tissue

Supplemental Table 6

FCS filename	ID	Tissue Type
19_561_ADJ_N_PANC.fcs	19-561	Adjacent Normal
19_700_ADJ_N_PANC.fcs	19-700	Adjacent Normal
19_732_ADJ_N_PANC.fcs	19-732	Adjacent Normal
DS20191172_Tissue_PancNAdj_PDA.fcs	DS20191172	Adjacent Normal
DS20191196_Tissue_PancNAdj_DA.fcs	DS20191196	Adjacent Normal
DS20191252_ADJ_N_PANC.fcs	DS20191252	Adjacent Normal
DS20191258_ADJ_N_PANC.fcs	DS20191258	Adjacent Normal
19-262_ADJ_N_PANC.fcs	19-262	Adjacent Normal
19_262_Tissue_Tumor_PDA.fcs	19-262	Tumor
19_364_Tissue_Tumor_PDA.fcs	19-364	Tumor
DS20191253_Tissue_Tumor_PDA.fcs	DS20191253	Tumor
6135_3210_Tissue_Tumor_PDA.fcs	61353210	Tumor
DS20181107_Tissue_Tumor_PDA_MCN.fcs	DS20181107	Tumor
DS20191225_Tissue_Tumor_PDA.fcs	DS20191225	Tumor
DS20191229_Tissue_Tumor_PDA.fcs	DS20191229	Tumor
DS20191240_Tissue_Tumor.fcs	DS20191240	Tumor
DS20191252_Tissue_Tumor_PDA.fcs	DS20191252	Tumor
DS20191262_Tissue_Tumor_PDA.fcs	DS20191262	Tumor
DS20191296_Tissue_Tumor_PDA.fcs	DS20191296	Tumor