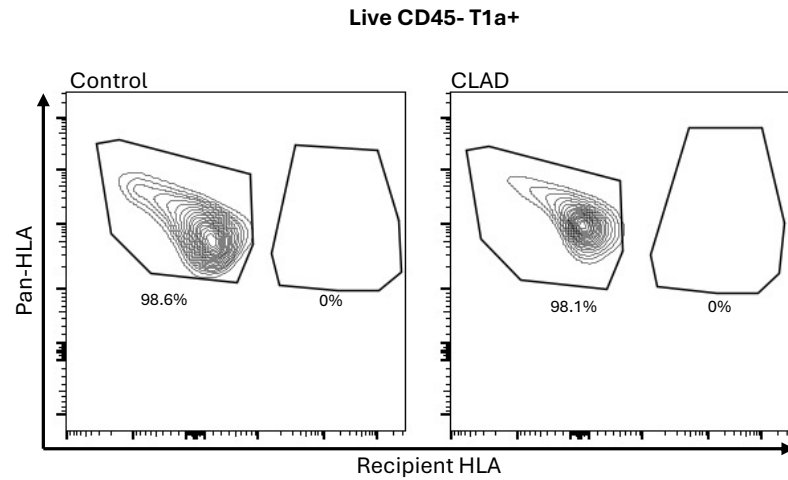
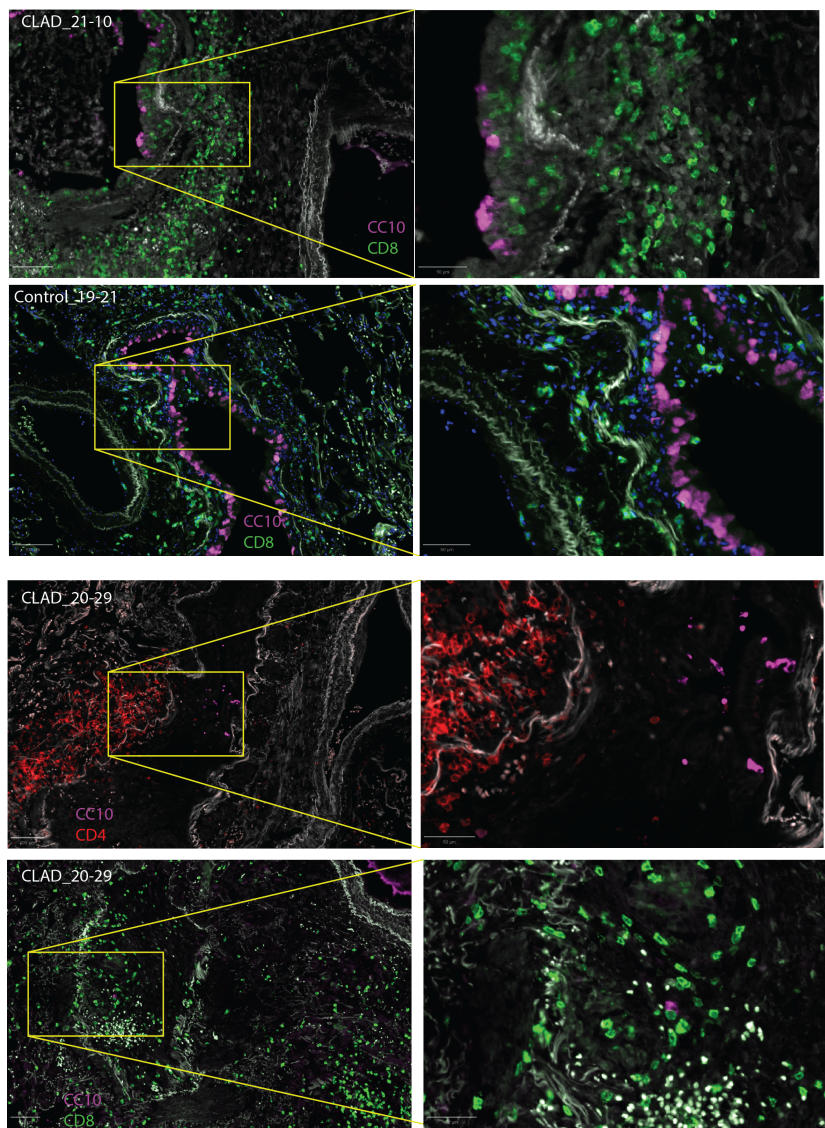


Figure S1. T cell flow identification via flow cytometry



S2. Representative flow cytometry plot showing cellular origin (donor versus recipient based on human leukocyte antigen (HLA) discrepancies) of CD45-T1a+ cells in the lung draining lymph node. Cells were universally of donor origin (pan-HLA positive, recipient HLA negative).

A



B

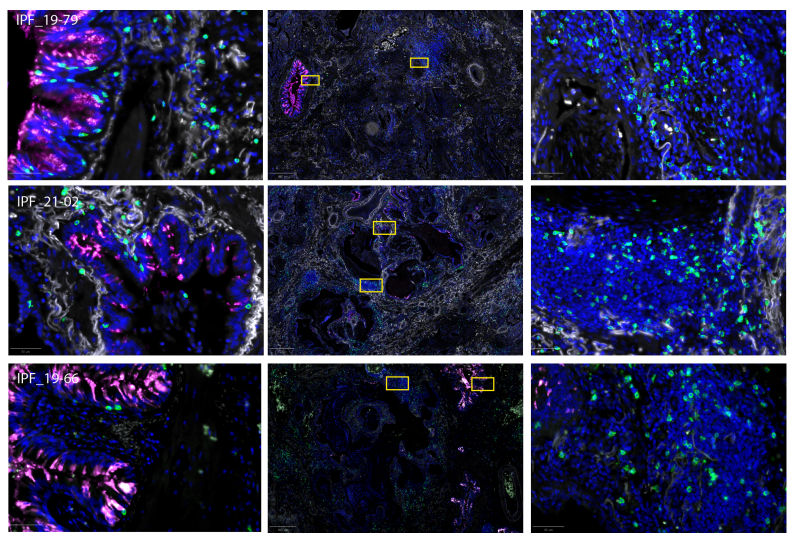
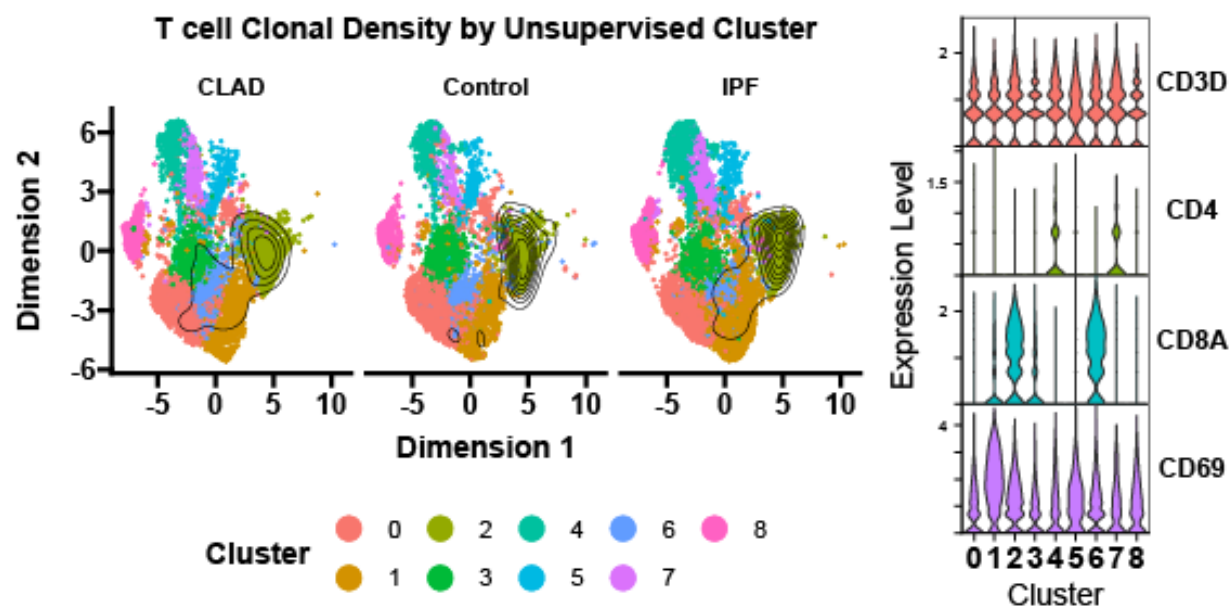


Figure S3: Lung CC10, CD8, and CD4 co-localization. A) CLAD and Control lung CC10 and CD8 co-localization (top 2 panels) and CC10 and CD4 co-localization (bottom 2 panels). B) IPF lung CC10, CD8, and CD4 co-localization. (Purple = CC10, Green = CD8, Red = CD4).



S4. Unsupervised clustering of T cells identifies a specific cluster (2) that contains a population of CD8A high cells that are clonally expanded.

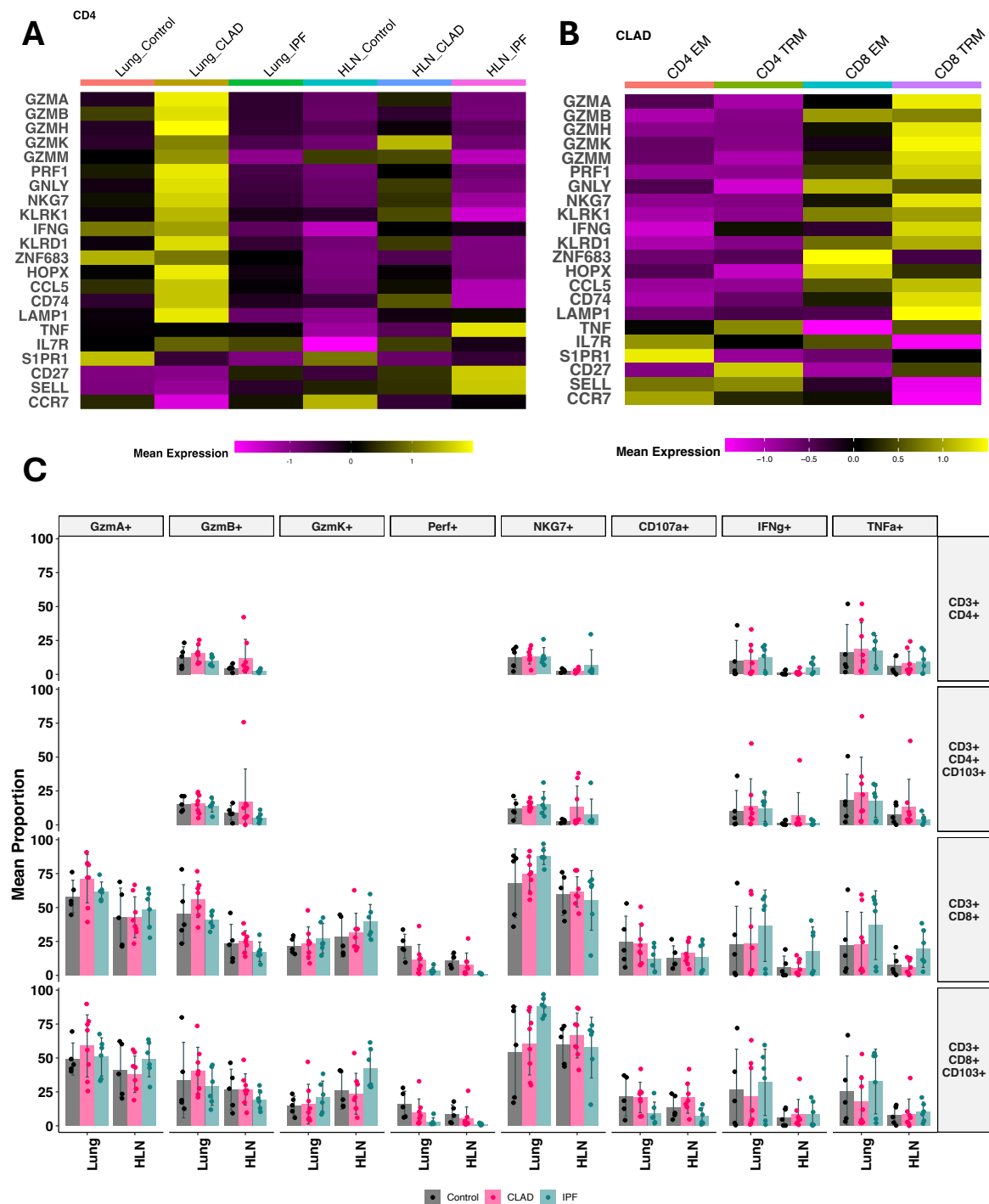
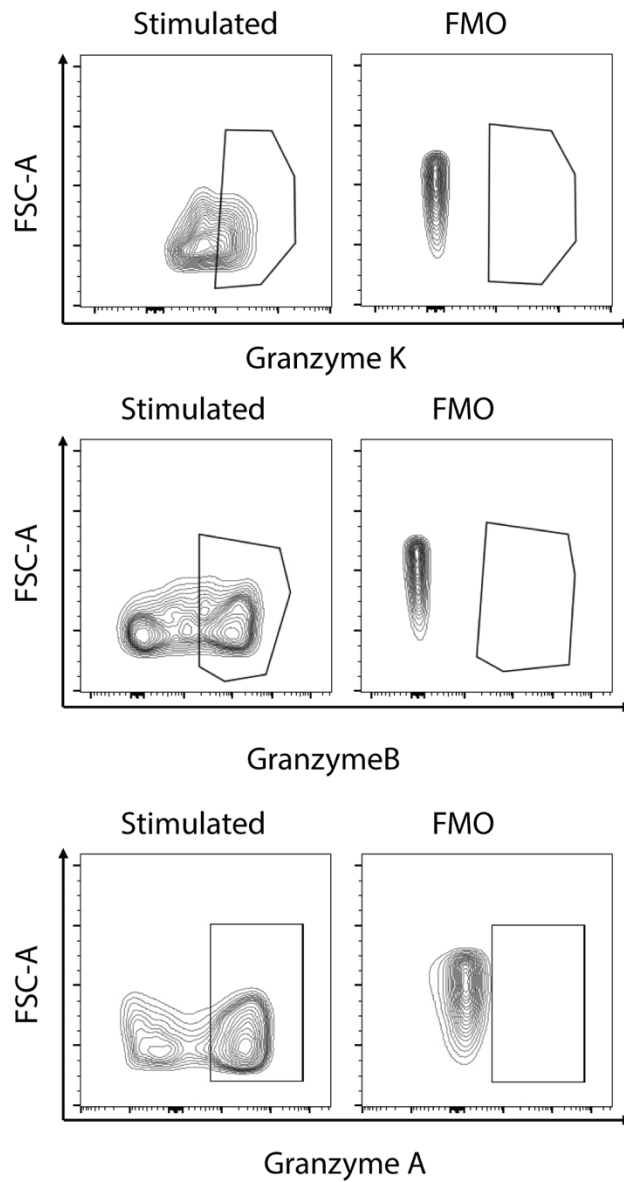
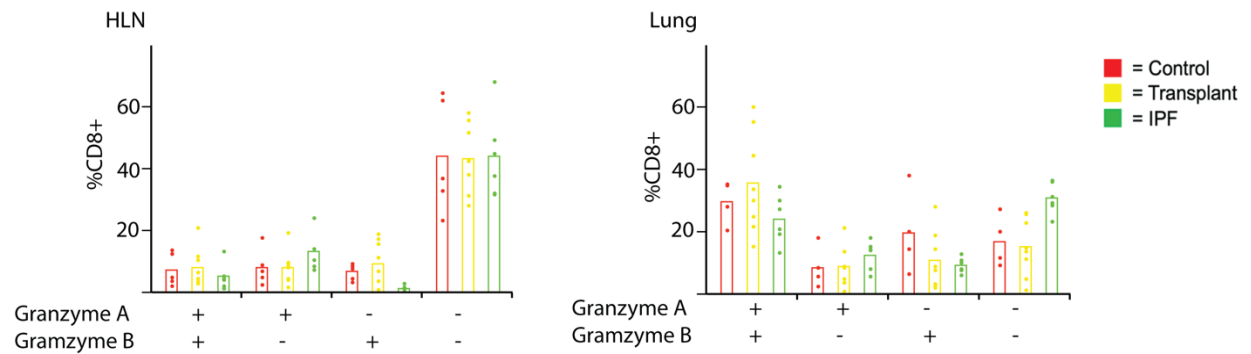


Figure S5: T cell cytokine transcript and protein expression levels. A) Mean normalized CD4+ T cell gene expression of genes associated with cytotoxic effector function by disease and anatomic location. B) Mean normalized CLAD T cell gene

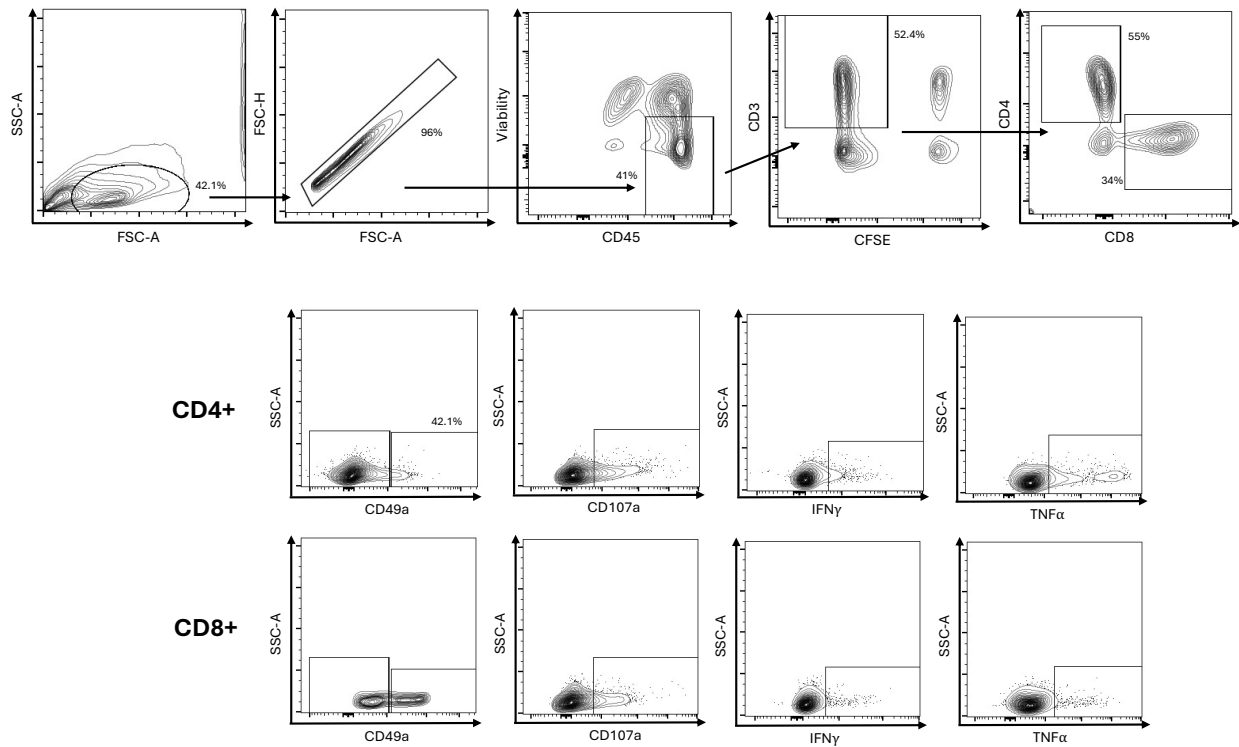
expression by phenotype. C) Mean proportion of protein expression as measured via flow cytometry for all CD4+ and CD8+ T cells and their resident memory subsets.



S6. Representative flow cytometry plots defining serine protease positivity based on fluorescence minus one (FMO).



S7. Mean proportion of CD8⁺ T cells co-expressing Granzymes A and B in the HLN and Lung of lungs obtained from organ donors without underlying lung disease (control), idiopathic pulmonary fibrosis (IPF), and CLAD (Transplant). No statistically significant difference between conditions.



S8. Representative flow cytometry gating strategy for T cells obtained from murine grafts.

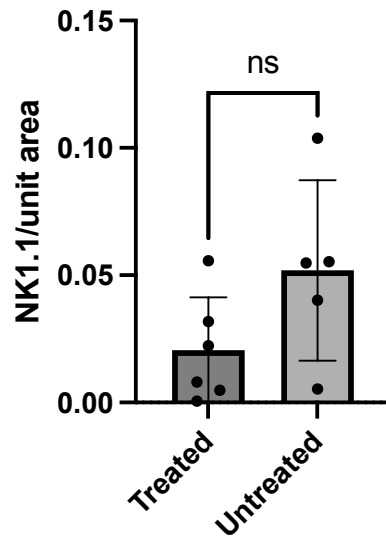


Figure S9: NK cell quantification following in-vivo NKG2D blockade. NK cells were quantified in the lung of orthotopically transplanted mice who were treated with NKG2D blockade compared to controls.

Supplementary Table 1: Tissue donor characteristics

TX ID	Study ID	Age	Gender	Diagnosis	Induction	CMV (D/R)	Experiment
2020-47-LT	CLAD1	24	Male	CLAD	Basiliximab	(-/+)	SC, IF
2021-10-LT	CLAD2	29	Female	CLAD	Alemtuzumab	(+/-)	SC, IF
2022-127-WA	CLAD3	78	Female	CLAD	Alemtuzumab	(+/-)	FC, IF
2020-45-LT	CLAD4	33	Female	CLAD	Basiliximab	(+/-)	FC, SC
2022-94-LT	CLAD5	37	Male	CLAD	Alemtuzumab	(-/+)	FC
2020-29-LT	CLAD6	27	Female	CLAD	Basiliximab	(+/-)	FC, IF
2019-16-LT	CLAD7	22	Female	CLAD	Alemtuzumab	(+/-)	IF
2022-96-WA	CLAD8	63	Female	CLAD	Basiliximab	(+/-)	FC
2022-125-LT	CLAD9	27	Female	CLAD	Alemtuzumab	(-/-)	FC
2023-92-LT	CLAD10	30	Female	CLAD			IF
2020-56-C	Control1	29	Female	Non-Diseased	NA	NA	FC, SC
2020-5-C	Control2	29	Male	Non-Diseased	NA	(+)	SC, IF
2020-60-C	Control3	27	Male	Non-Diseased	NA	(+)	FC
2019-24-C	Control4	68	Female	Non-Diseased	NA	(+)	FC
2020-61-C	Control5	28	Male	Non-Diseased	NA	(-)	FC
2019-28-C	Control6	29	Male	Non-Diseased	NA	NA	FC
2019-21-C	Control7	51	Female	Non-Diseased	NA	(-)	IF
2020-12-C	Control8	58	Male	Non-Diseased	NA	(-)	IF
2021-39-C	Control9	50	Male	Non-Diseased	NA	(-)	IF
2021-38-C	Control10	25	Male	Non-Diseased	NA	NA	SC
2021-41-C	Control11	81	Female	Non-Diseased	NA	NA	IF
2022-54-C	Control12	21	Male	Non-Diseased	NA	NA	IF
2023-15-C	Control13	23	Female	Non-Diseased	NA	NA	IF
2023-82-C	Control14	46	Male	Non-Diseased	NA	NA	IF
2023-66-C	Control15	57	Male	Non-Diseased	NA	NA	IF
2022-09-LT	IPF1	57	Female	IPF	NA	(+)	FC, SC
2022-13-LT	IPF2	68	Female	IPF	NA	(+)	FC, SC
2022-07-LT	IPF3	63	Male	IPF	NA	(+)	FC, SC
2022-15-LT	IPF4	68	Male	IPF	NA	(-)	FC, SC
2021-59-LT	IPF5	57	Male	IPF	NA	(-)	FC, SC
2021-48-LT	IPF6	69	Male	IPF	NA	(+)	FC, SC

IF: Immunofluorescence, SC: Single cell RNA/TCR, FC: flow cytometry, NA: Not available
CLAD: Chronic Lung Allograft Dysfunction, IPF: Idiopathic Pulmonary Fibrosis

Supplementary Table 2: Flow cytometry antibodies

Target	Clone	Species reactivity	Manufacturer	Fluorophore
CD3	SK7	Human	BD Biosciences	BUV 395
Viability	---	Human	Biolegend	Zombie UV
CD56	NCAM16.2	Human	BD Biosciences	BUV661
CD8	SK1	Human	Biolegend	BUV737
Granzyme B	QA18A28	Human	Biolegend	BV421
CD4	SK3	Human	BD Biosciences	BV480
Perforin	dG9	Human	Biolegend	BV510
CD107a	H4A3	Human	Biolegend	BV605
IL-10	JES3-9D7	Human	BD Biosciences	BV650
PD1	EH12.2H7	Human	Biolegend	BV711
CCR7	G043H7	Human	Biolegend	BV785
Pan HLA	W6/32	Human	Biolegend	FITC
HLA B7	BB7.1	Human	Biolegend	PE
HLA A2	BB7.2	Human	Biolegend	PE
HLA A3	GAP.A3	Human	Biolegend	PE
CD45	HI30	Human	Biolegend	PE-Cy5
Granzyme K	GM26E7	Human	Biolegend	PE-Cy7
TNFa	Mab11	Human	Biolegend	APC
Granzyme A	CB9	Human	Biolegend	AF647
Granzyme B	QA18A28	Human	Biolegend	AF700
IFNg	B27	Human	BD Biosciences	APC-R700
CD103	B27	Human	BD Biosciences	APC-Cy7
HLA-DR	G46-6	Human	BD Biosciences	BUV615
CD25	BC96	Human	Biolegend	BV421
CD20	2H7	Human	Biolegend	BV510
CD45RA	HI100	Human	Biolegend	BV605
CD69	FN50	Human	Biolegend	BV650
CD31	WM59	Human	Biolegend	BV711
CRTAM	Cr24.1	Human	Biolegend	PerCP-Cy5.5
NKG2D	1D11	Human	BD Biosciences	PE-CF594
Granulysin	DH2	Human	Biolegend	PE-Cy7
FOXP3	236A/E7	Human	BD Biosciences	AF647
CD56	5.1H11	Human	Biolegend	AF700
CD49a	SR84	Human	BD Biosciences	BV711
CFSE	---	Human	Fisher Scientific	---
CD107a	H4A3	Human	Biolegend	PE
CD3	UCHT1	Human	Biolegend	APC
CD45	30-F11	Mouse	Biolegend	BV510

CD4	GK1.5	Mouse	Biolegend	BV605
NK1.1	PK136	Mouse	Biolegend	BV785
CD62L	MEL-14	Mouse	Biolegend	PE
CD8a	53-6.7	Mouse	Biolegend	PerCP-Cy5.5
CD44	IM7	Mouse	Biolegend	PE-Cy7
Nkg2D	CX5	Mouse	Biolegend	APC
CD3	17A2	Mouse	Biolegend	APC-Cy7
CD69	H1.2F3	Mouse	BD Biosciences	BV480
CD49a	Ha31/8	Mouse	BD Biosciences	BV711
HLA A2	---	Mouse	Biolegend	FITC
Perforin	S16009A	Mouse	Biolegend	PE-Dazzle 594
CD19	6D5	Mouse	Biolegend	PE-Cy5
CD45 (tail vein)	30-F11	Mouse	Biolegend	AF700
Fc Block	---	Mouse	Biolegend	--
RNAscope™				
Target	Gene ID	Species	Supplier	Accession Number
Klrk1	27007	Mouse	ACD	NM_033078.4
Cd8a	12525	Mouse	ACD	NM_009857.1
Scgb1a1	22287	Mouse	ACD	NM_011681.2