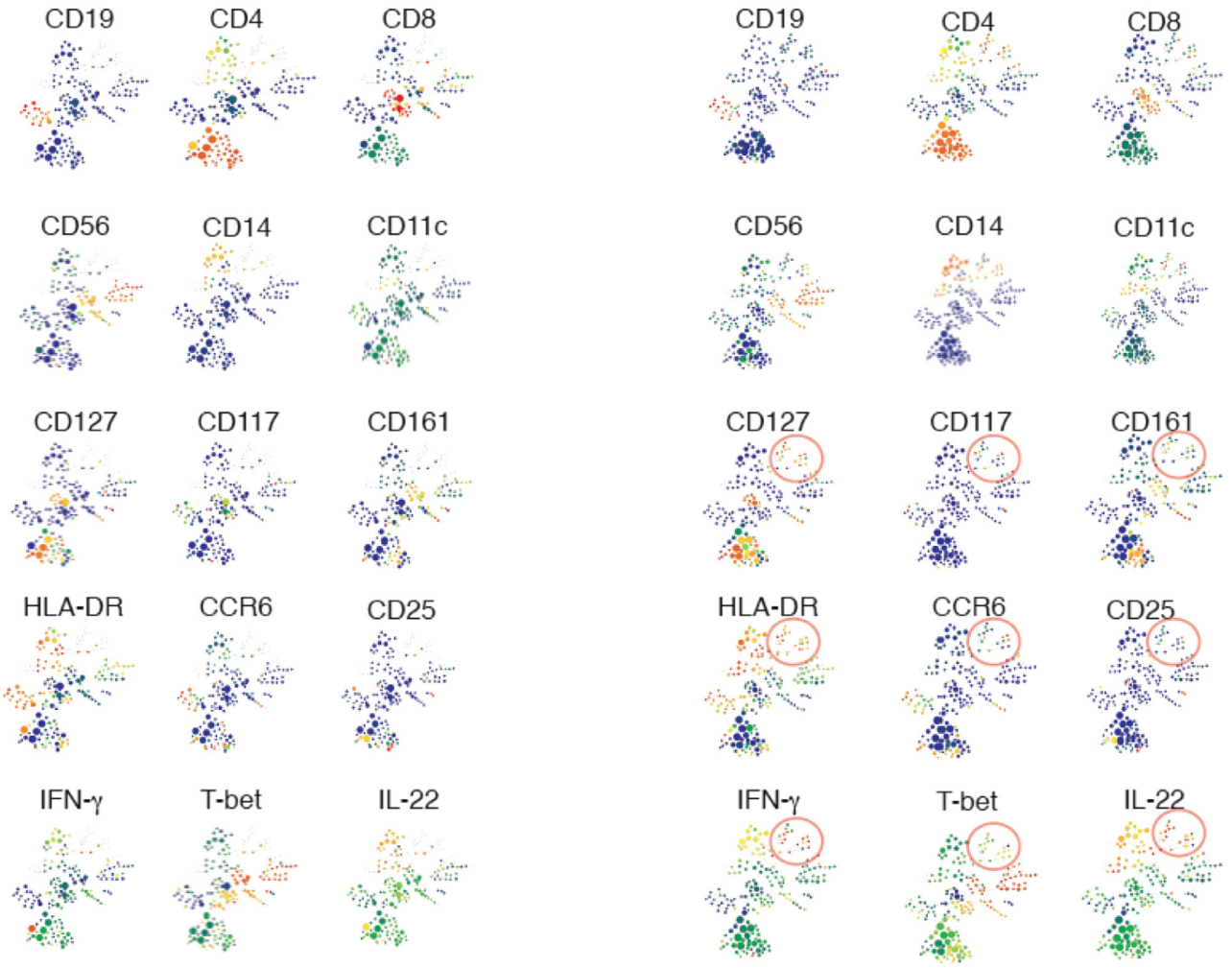

FIG E1. Overlaid expression patterns of CD19, CD4, CD8, CD56, CD14, CD11c, CD127, CD117, CD161, HLA-DR, CCR6, CD25, T-bet, IFN-γ, and IL-22. Node color was scaled to the median intensity of maker expression of the cells within each node expressed as a percentage of the maximum value in the data set displayed. One representative experiment of 4 is displayed.

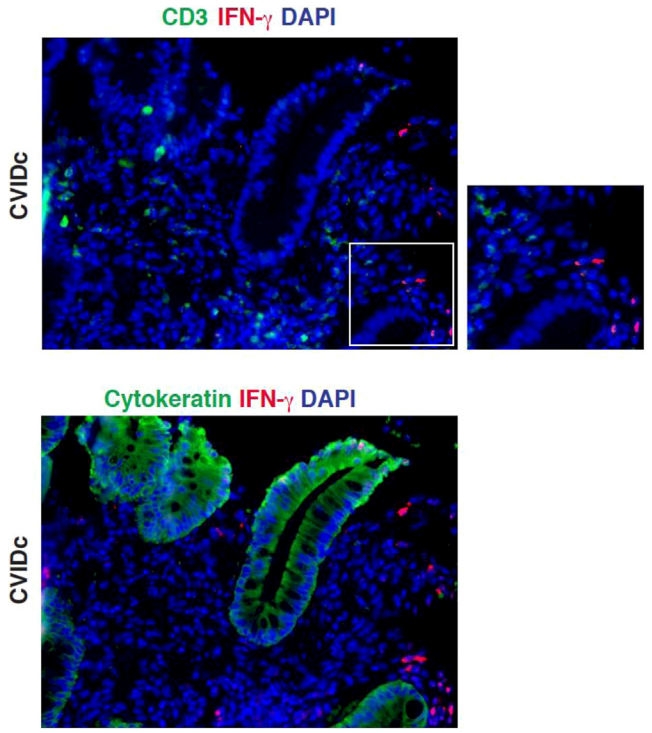

FIG E2. Gastrointestinal biopsy specimens of jejunum of a patient with CVID with enteropathy stained for CD3 *(left panel)* or cytokeratin *(right panel*; *green)* and IFN-γ *(red)* and counterstained with 4′,6-diamidino-2-phenylindole dihydrochloride *(DAPI)* for nuclei *(blue)*. Original magnification ×40.

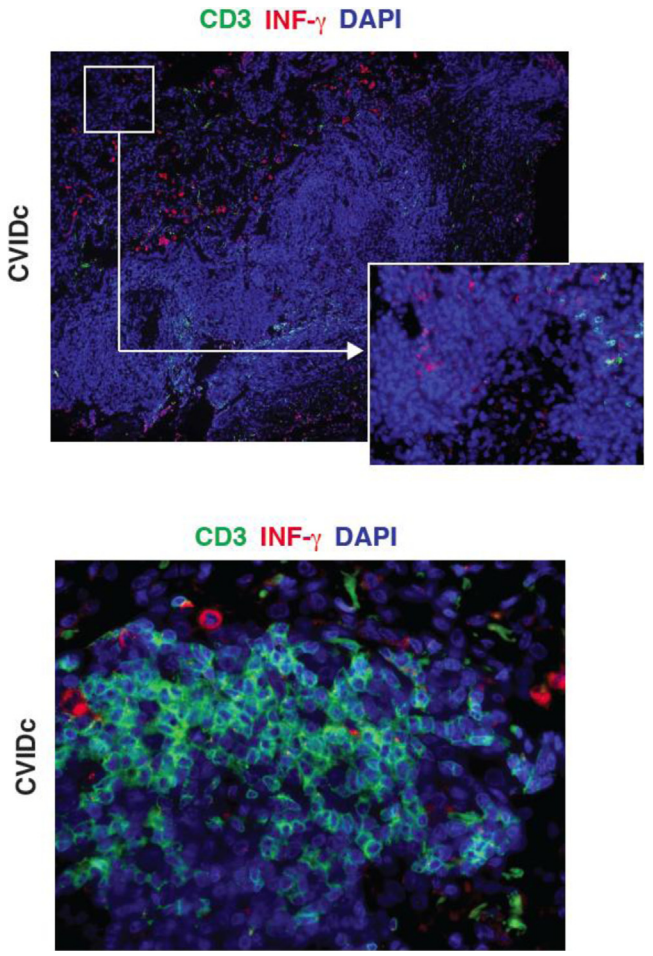

FIG E3. Lung biopsy specimens of a patient with CVID given a diagnosis of lymphocytic interstitial pneumonitis *(upper panels, CVIDc)* and a patient with CVID given a diagnosis of reactive lymphoid hyperplasia. Tissue was stained for $CD3^+$ T cells *(green)* and IFN-γ *(red)* and counterstained with 4′,6-diamidino-2-phenylindole dihydrochloride *(DAPI)* for nuclei *(blue)*. *White squares* indicate area of inset magnification. Original magnification ×10 (inset).

TABLE E1. Antibodies used in flow cytometry and immunofluorescence

Antigen	Label	Isotype	Clone	Source	Use
CD1d	PE			‡	FC
CD2	PE	Mouse, IgG_1 κ	RPA-2.10	BD	FC
CD3		Rat, IgG_1	CD3-12	AbD	IF
CD3	PerCP-Cy5.5	Mouse, IgG_1 κ	eBio4B10	eBioscience	FC
CD3	APC-eF780	Mouse, IgG_1 κ	SK7	eBioscience	FC
CD3	BV 450	Mouse, IgG_1 κ	MI15	BD	FC
CD4	FITC	Mouse, IgG_1 κ	L200	BD	FC
CD8	PE	Mouse, IgG_1 κ	Leu-2a	BD	FC
CD11c	APC-Cy7	Mouse, IgG_1 κ	3.9	eBioscience	FC
CD11c	eFluor 450	Mouse, IgG_1 κ	3.9	eBioscience	FC
CD14	PE	Mouse, IgG_{2a} κ	M5E2	BD	FC
CD14	APC-Cy7	Mouse, IgG_1 κ	HCD14	BioLegend	FC
CD16	BV 450	Mouse, IgG_1 κ	3G8	BD	FC
CD19	FITC	Mouse, IgG_1 κ	4G7	BD	FC
CD19	PerCP-Cy5.5	Mouse, IgG_1 κ	HIB19	eBioscience	FC
CD19	APC-Cy7	Mouse, IgG_1 κ	HIB19	BioLegend	FC
CD25	APC	Mouse, IgG_1 κ	M-A251	BD	FC
CD27	PerCP-Cy5.5	Mouse, IgG_1 κ	M-T271	BD	FC
CD45	PE-Cy7	Mouse, IgG_1 κ	HI30	BD	FC
CD49d (a4)	APC	Mouse, IgG_1 κ	9F10	BioLegend	FC
CD56	APC	Mouse, IgG_1 κ	CMSSB	eBioscience	FC
CD56	BV605	Mouse, IgG_{2b} κ	NCAM16.2	BD	FC
CD90 (Thy-1)	PE-Cy7	Mouse, IgG_1 κ	5E10	BioLegend	FC
CD103	PE-Cy7	Mouse, IgG_1 κ	B-Ly7	eBioscience	FC
CD117 (c-Kit)	PE-Cy7	Mouse, IgG_1 κ	104D2	eBioscience	FC
CD123	FITC	Mouse, IgG_{2a} κ	7G3	BD	FC
CD127	FITC	Mouse, IgG_1 κ	eBioRDR5	eBioscience	FC
CD127	eFluor 450	Mouse, IgG_1 κ	eBioRDR5	eBioscience	FC
CD196 (CCR6)	PerCP-eF710	Mouse, IgG_1 κ	R6H1	eBioscience	FC
CD212 IL-12Rβ	PE	Mouse, IgG_1 κ	2.4E6	BD PharMingen	FC
CD335 (NKp46)	APC	Mouse, IgG_1 κ	9E2	BioLegend	FC
CD336 (NKp44)	APC	Mouse, IgG_1 κ	2.29	Miltenyi Biotec	FC
CXCR3 (CD183)	PE-Cy7	Mouse, IgG_1 κ	1C6	BD	FC
IFN-γ		Rabbit	H-145†	Santa Cruz	IF
IFN-γ	FITC	Mouse, IgG_1 κ	4S.B3	BD	FC
IFN-γ	PE	Mouse, IgG_1 κ	4S.B3	BD	FC
IL-17A	PerCP-Cy5.5	Mouse, IgG_1 κ	eBio64DEC17	eBioscience	FC
IL-22	eFluor 450	Mouse, IgG_1 κ	22URTI	eBioscience	FC
Integrin β7	APC	Rat, Ig_{G2} ακ	FIB504	BioLegend	FC
MHC-II	PE-Cy7	Mouse, IgG_1 κ	L243	eBioscience	FC
NKG2A (CD159α)	PE	Mouse, IgG_{2b}	Z199	Beckman	FC
NKG2D (CD314)	PE	Mouse, IgG_1	ON72	Beckman	FC
Pan-cytokeratin		Mouse, IgG_1	PCK-26	Abcam	IF
RORc		Rabbit	LS-A5191*	LSBio	IF
RORγ(t)	PE	Rat, IgG_{2a}	AFKJ-9	eBioscience	FC
T-cell receptor γδ	FITC	Mouse, IgG_1 κ	11F2	BD	FC
T-bet	PE	Mouse, IgG_1	eBio4B10	eBioscience	FC
T-bet	PerCP-Cy5.5	Mouse, IgG_1	eBio4B10	eBioscience	FC

APC, Allophycocyanin; *Cy*, cyanin; *FC*, flow cytometry; *FITC*, fluorescein isothiocyanate; *IF*, immunofluorescence; *PE*, phycoerythrin; *PerCP*, peridinin-chlorophyll-protein complex.

*Catalog number.

†Epitope.

‡Gift from A. Bonito, National Institutes of Health Tetramer Core Facility.

TABLE E2. Antibodies used in CyTOF analysis

Antigen	Isotope	Clone	Source
CCR6	141 Pr	Go34E3	Fluidigm
CD19	142 Nd	HIB19	Fluidigm
CD117	143 Nd	104D2	Fluidigm
CD4	145 Nd	RPA-T4	Fluidigm
CD8	146 Nd	RPA-T8	Fluidigm
CD20	147 Sm	2H7	Fluidigm
CD16	148 Nd	3G8	Fluidigm
CD66	149 Sm	CD66a-B1.1	Fluidigm
CD123	151 Eu	6H6	Fluidigm
CD45	154 Sm	HI30	Fluidigm
CD90	159 Tb	5E10	Fluidigm
CD14	160 Gd	M5E2	Fluidigm
CD11c	162 Dy	Bu15	Fluidigm
CD161	164 Dy	HP-3G10	Fluidigm
CD127	165 Ho	A019D5	Fluidigm
CD25	169 Tm	2A3	Fluidigm
CD3	170 Er	UCHT1	Fluidigm
HLA-DR	174 Yb	L243	Fluidigm
CD56	176 Yb	NCAM16.2	Fluidigm
IL-22	150 Nd	22URTI	Fluidigm
T-bet	161 Dy	4B10	eBioscience
IFN-γ	168 Er	B27	Fluidigm

TABLE E3. Primers for RT-PCR

ACTB	Sense	GGATGCAGAAGGAGATCACT
	Antisense	CGATCCACACGGAGTACTTG
AHR	Sense	AATACAAAGCCATTCAGAGCC
	Antisense	CAGAAAACAGTAAAGCCAATC C
ID2	Sense	TCAGCCTGCATCACCAGAGA
	Antisense	CTGCAAGGACAGGATGCTGATA
IFNG	Sense	CTAATTATTCGGTAACTGACTTGA
	Antisense	ACAGTTCAGCCATCACTTGGA
IL17A	Sense	CGATCCACCTCACCTTGGA
	Antisense	CTCCCAGATCACAGAGGGATATCT
IL22	Sense	CCCATCAGCTCCCACTGC
	Antisense	GCTCACTCATACTGACTCCGT
IL26	Sense	TCAACAGCTTGGGACAATGTTC
	Antisense	TTTGAGGTGTGGGTTGCTGTTA
IL23R	Sense	AACAACAGCTCGGCTTTGGT
	Antisense	GGAATATCTGGCGGATAT
PLZF	Sense	TCTGACAAAGATGGGGATGATCC
	Antisense	CAGTATTCCGTGCAGATGGTACAC
PRF1	Sense	AGGAGCTGGGCAGAAGGACAAGA
	Antisense	CACCATAGAGGGCACAAGGGAAGG
RORC	Sense	TGAGAAGGACAGGGAGCCAA
	Antisense	CCACAGATTTTGCAAGGGATCA
TBX21	Sense	GATGTTTGTGGACGTGGTCTTG
	Antisense	CTTTCCACACTGCACCCACTT