Supplementary Figures and Tables for:

Systemic Neutrophil Gelatinase-Associated Lipocalin Alterations in Chronic Pancreatitis: A Multicenter, Cross-Sectional Study

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| Disease State	Inclusion Criteria	Exclusion Criteria
Control		• History of pancreatic disease • Upper abdominal symptoms • Family history of pancreatic disease, celiac disease, or cystic fibrosis
		For All Pancreatitis Subjects
AP	• One documented attack of AP in the prior 18 months • Imaging evidence of AP on CT scan or MRI/MRCP • Cambridge grade <3 on CT scan or MRI/MRCP • <50% pancreatic necrosis (if present) • No prior pancreatic surgery	• History of autoimmune or traumatic pancreatitis • Presence of gallstones (AP and RAP only) • A sentinel attack of acute necrotizing pancreatitis which results in suspected disconnected duct syndrome • Primary pancreatic tumors • Pancreatic metastases from other malignancies • Known isolated EPD in the absence of any eligible inclusion criteria • Abnormal creatinine or renal failure (AP and RAP only)
RAP	• 2 or more attacks of AP • Cambridge grade <3 on CT scan or MRI/MRCP • No prior pancreatic surgery	
CP	• Cambridge grade 3-4 and/or parenchymal or ductal calcifications by CT scan or MRI/MRCP OR • Pancreatic histology diagnostic of CP including findings of fibrosis, chronic inflammation, and acinar loss	

Supplemental Table 1: Inclusion and Exclusion Criteria. Criteria established at the beginning of the biobanking studies whose samples were used for the current study. (modified from Yadav D. et al. 2018)

| Metal Label	Bead	Clone
Rh103Di	Live_Dead	Cell-ID Intercalator-103Rh
Xe131Di	Control Bead	
Cs133Di	Control Bead	
Ce140Di	Control Bead	
Sm147Di	CD11c	Bu15
Eu151Di	CD161	HP-3G10
Eu153Di	CD25_IL-2Ra	BC96
Sm154Di	CD27	O323
Gd156Di	CD183_CXCR3	G025H7
Ho165Di	CD33	WM53
Lu175Di	Control Bead	
Ir191Di	DNA1	DNA
Ir193Di	DNA2	DNA
Ce142Di	Control Bead	
Nd148Di	CD16	3G8
Sm152Di	CD194_CCR4	L291H4
Er167Di	CD197_CCR7	G043H7
Pr141Di	CD196_CCR6	G034E3
Nd143Di	CD123_IL-3R	6H6
Nd144Di	CD19	HIB19
Nd145Di	CD4	RPA-T4
Sm149Di	CD45RO	UCHL1
Gd155Di	CD57	HCD57
Gd158Di	CD185_CXCR5	J252D4
Tb159Di	NGAL	EPR19912
Gd160Di	CD28	CD28.2
Dy164Di	TCRγδ	B1
Er166Di	CD294	BM16
Er168Di	CD14	63D3
Er170Di	CD3	UCHT1
Yb172Di	CD66b	G10F5
Yb174Di	IgD	IA6-2
Dy161Di	CD38	HB-7
Ba138Di	Control Bead	
Nd146Di	CD8a	RPA-T8
Nd150Di	CD45RA	HI100
Dy163Di	CD56_NCAM	NCAM16.2
Yb171Di	CD20	2H7
Yb173Di	HLA-DR	LN3
Yb176Di	CD127_IL-7Ra	A019D5
BCKG190Di	Control Bead	
Sn120Di	Control Bead	
Pb208Di	Control Bead	
Pt195Di	Control Bead	
Pt194Di	Control Bead	
Pt198Di	Control Bead	
I127Di	Control Bead	
Bi209Di	CD11b	ICRF44
Y89Di	CD45	HI30

Supplemental Table 2: CyTOF Antibody Panel. The metal isotope labels, antibodies, and clones used with Maxpar Direct Immune Profiling Assay Kit.

| PBMCs Populations and Subtypes	Phenotype
T cells	CD3+CD45+
αβ T cells	CD3+CD45+TCRgd-
CD8+	CD3+TCRgd-CD4-CD8+
Naïve	CCR7+CD45RA+
Central Memory	CCR7+CD45RA-
Effector Memory	CCR7-CD45RA-
Terminal Effector	CCR7-CD45RA+
Activated	CD38+HLADR+
CD4+	CD3+TCRgd-CD4+CD8-
Naïve	CCR7+CD45RA+
Central Memory	CCR7+CD45RA-
Effector Memory	CCR7-CD45RA-
Terminal Effector	CCR7-CD45RA+
Activated	CD38+HLADR+
T regulatory	CD4+CCR4+CD25+CD127-
Naïve	CD45RA+CD45RO-
Activated	HLADR+
Memory	CD45RA-CD45RO-
Th1	CXCR5-CXCR3+CCR6-
Th2	CXCR5-CXCR3-CCR6-
Th17	CXCR5-CXCR3-CCR6+
γδ T cells	CD3+TCRgd+
B cells	CD19+CD3-
Naïve	CD20+CD27-IgD+
Memory	CD20+CD27+IgD-
Memory Resting	CD20+CD27+IgD+
Plasmablasts	CD20-CD27+CD38+
Natural Killer cells	CD56+CD161+CD123-
CD16-	CD16-
CD16+	CD16+
Monocytes	CD3-CD14+
Classical	CD16-
Non-classical	CD16+
Dendritic Cells	CD19-CD3-HLADR+CD56-
Plasmacytoid	CD16-CD123+CD11c-
Myeloid	CD16-CD123-CD11c+
Neutrophils	CD66b+CD294-CD16+
Eosinophils	CD66b+CD294+CD16-
Basophils	CD66b-CD123+CD294+
Monocytic myeloid derived stem cell	CD66b-CD20-CD19-CD3-CD14+CD11b+
Granulocytic myeloid derived stem cell	CD66b+CD11b+

Supplemental Table 3: PBMC Population Hierarchy and Phenotypic Markers. Hierarchy of immune populations and subpopulations analyzed, and the phenotypic markers used for manual gating.
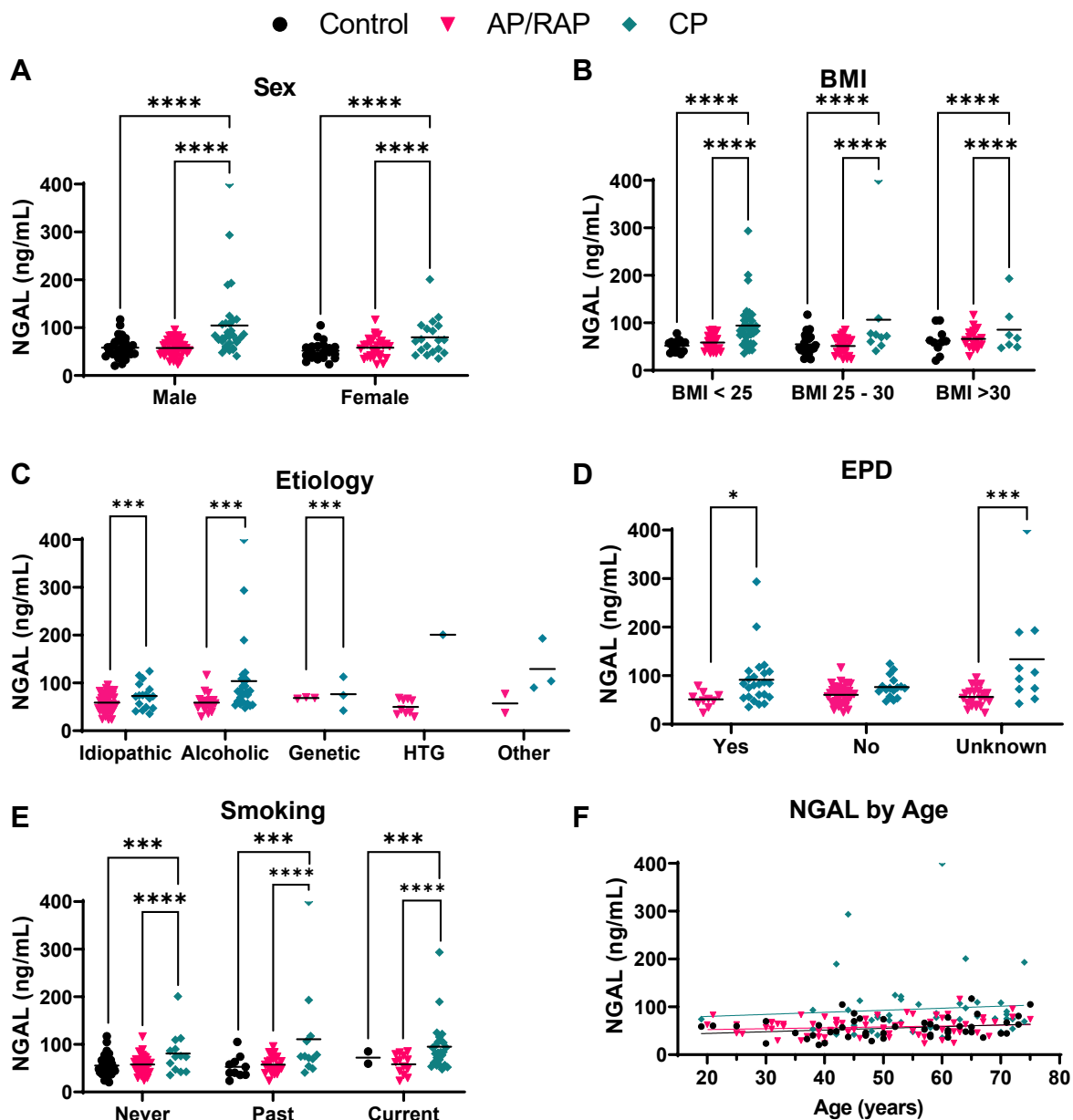
Supplemental Figure 1: NGAL expression is not affected by many clinical characteristics in subjects with CP. Samples were subdivided by (**A**) sex, (**B**) BMI, (**C**) etiology of pancreatitis, (**D**) EPD, (**E**) history of smoking and compared for plasma NGAL concentration, and (**F**) age,. Statistical significance was determined by 2-way ANOVA with Tukey's multiple testing correction or correlation slope analysis for age. *p<0.05, ***p<0.001, ****p<0.0001.
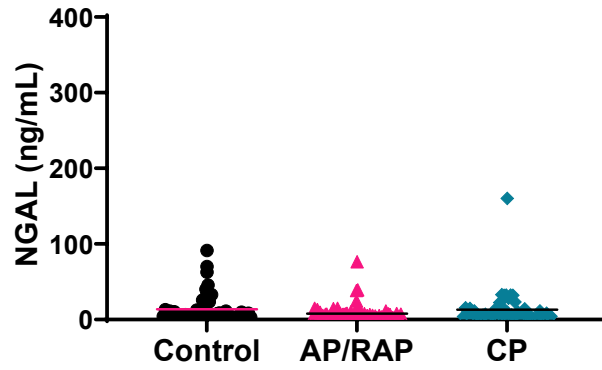
Supplemental Figure 2: NGAL expression does not change in the urine of subjects with CP. NGAL measured by ELISA from urine from the same subjects as the plasma samples in the PROCEED study set
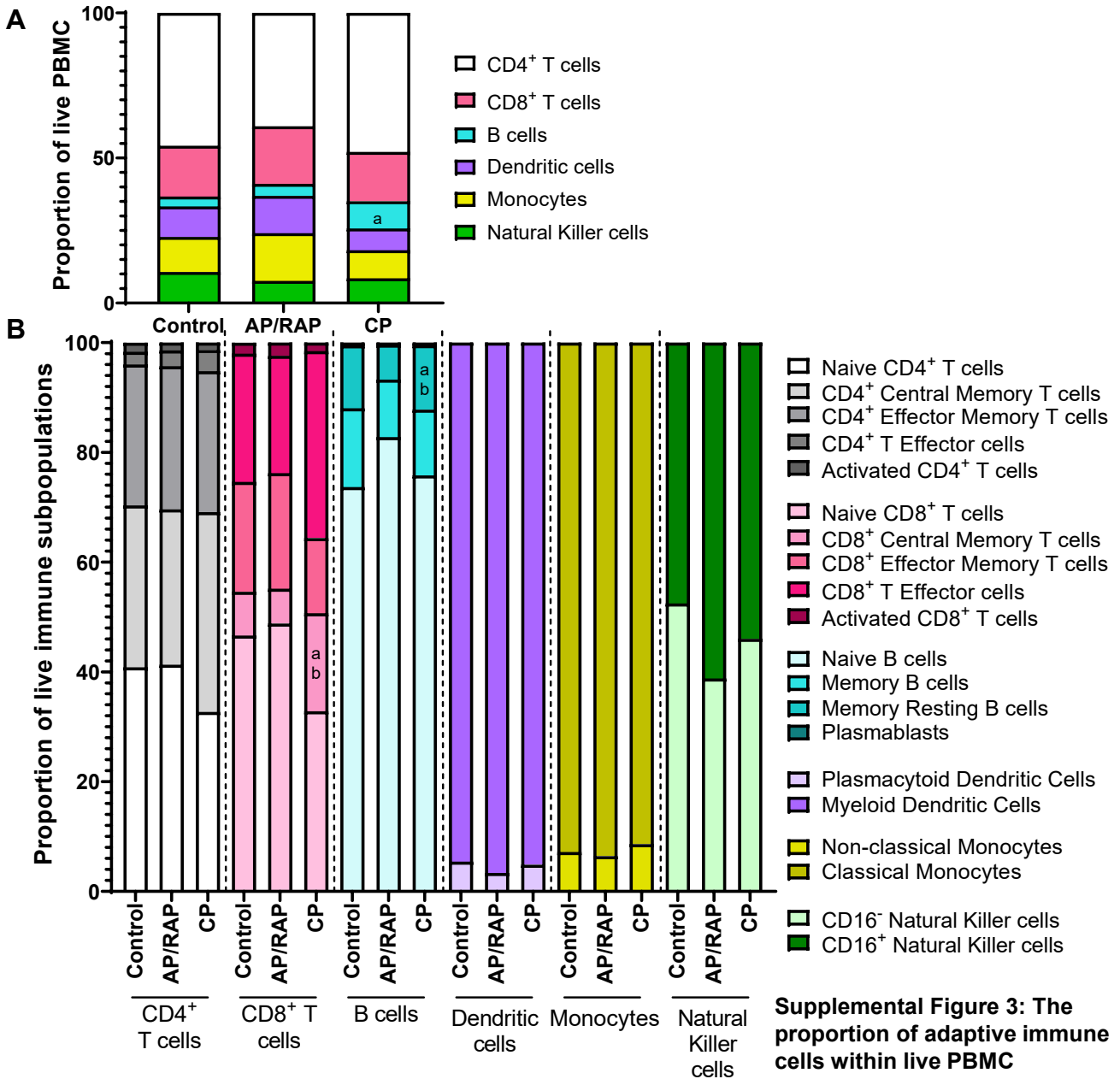
Supplemental Figure 3: The proportion of adaptive immune cells within live PBMC populations and subsets increase in CP subjects. PBMCs from PROCEED (healthy controls, AP/RAP, and CP subjects) collected during enrollment visit were analyzed by CyTOF. (**A**) Proportion of major immune populations and (**B**) subpopulations. a – *P* <0.05 between control and CP; b – *P* <0.05 between AP/RAP and CP; c – *P* <0.05 between control and AP/RAP

Supplemental Table 6: Multiple logistic regressions containing the percent of live PBMC subpopulations.

% of live PBMCs	Odds Ratio	95% CI	P-value	AUC
Control vs. CP				0.883****
Intercept	0.07	0.002 – 1.10	0.090	
CD8$^+$ central memory T cells	1.50	1.14 – 2.26	0.015	
Memory resting B cells	0.82	0.60 – 0.95	0.115	
AP/RAP vs. CP				0.890****
Intercept	0.10	0.005 – 1.07	0.086	
CD8$^+$ central memory T cells	1.48	1.16 – 2.11	0.046	
Memory resting B cells	0.79	0.58 – 0.96	0.008	