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Supplemental information

**Impaired islet function and normal exocrine
enzyme secretion occur with low
inter-regional variation in type 1 diabetes**

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Table S1. Characteristics of ND, AAb+, and T1D organ donors with secretion data collected from head, body, and tail pancreas regions.

Donor no.	nPOD ID	Donor Type	Autoantibody status	Age (years)	Diabetes Duration (months)	Sex	C-peptide (ng/ml)	HbA1c (%)	BMI
1	6540	ND	Negative	6.86	N/A	F	2.03	5.8	18.3
2	6543	ND	Negative	3.50	N/A	M	1.45	5.3	17.4
3	6544	ND	Negative	12.45	N/A	M	8.66	5.2	23.4
4	6546	ND	Negative	22.29	N/A	M	11.00	5.6	23.7
5	6547	ND	Negative	6.64	N/A	F	3.89	5.5	24.8
6	6548	ND	Negative	20.24	N/A	M	4.04	5.7	23.8
7	6552	ND	Negative	33.87	N/A	F	1.80	5.6	21.9
8	6556	ND	Negative	34.60	N/A	M	11.43	5.5	30.8
9	6559	ND	Negative	23.46	N/A	F	7.02	5.3	26.3
10	6560	ND	Negative	34.36	N/A	F	10.36	5.9	26.6
11	CV14	ND	Negative	9.00	N/A	M	4.40	5.7	13.7
12	6571	ND	Negative	28.10	N/A	M	4.57	6.1	29.7
13	6583	ND	Negative	30.54	N/A	M	10.55	5.0	24.8
14	6584	ND	Negative	22.53	N/A	M	6.02	5.3	21.1
15	6586	ND	Negative	13.21	N/A	M	6.83	5.1	27.4
16	6553	AAb+	mIAA+	12.34	N/A	F	4.62	5.7	24.8
17	6558	AAb+	GAD+	21.69	N/A	F	8.03	4.4	27.8
18	6562	AAb+	GAD+	29.77	N/A	F	13.19	5.6	18.2
19	6569	AAb+	GAD+	20.00	N/A	F	2.44	6.0	24.2
20	6573	AAb+	GAD+	24.48	N/A	F	1.85	5.1	35.5
21	6575	AAb+	GAD+	23.53	N/A	M	5.21	5.5	26.9
22	6582	AAb+	GAD+	22.38	N/A	F	2.67	5.6	23.0
23	6550	T1D	GAD+ ZnT8+	25.06	0	M	<0.02	14.0	16.4
24	6551	T1D	GAD+ IA-2+ mIAA+ ZnT8+	20.70	7	M	0.11	6.4	23.1
25	6563	T1D	IA-2+	14.60	0	F	1.04	9.6	25.5
26	6578	T1D	IA2+ ZnT8+	11.95	0	F	0.35	13.6	22.2
27	6579	T1D	GAD+ mIAA+	13.91	14	F	0.31	15.0	18.4

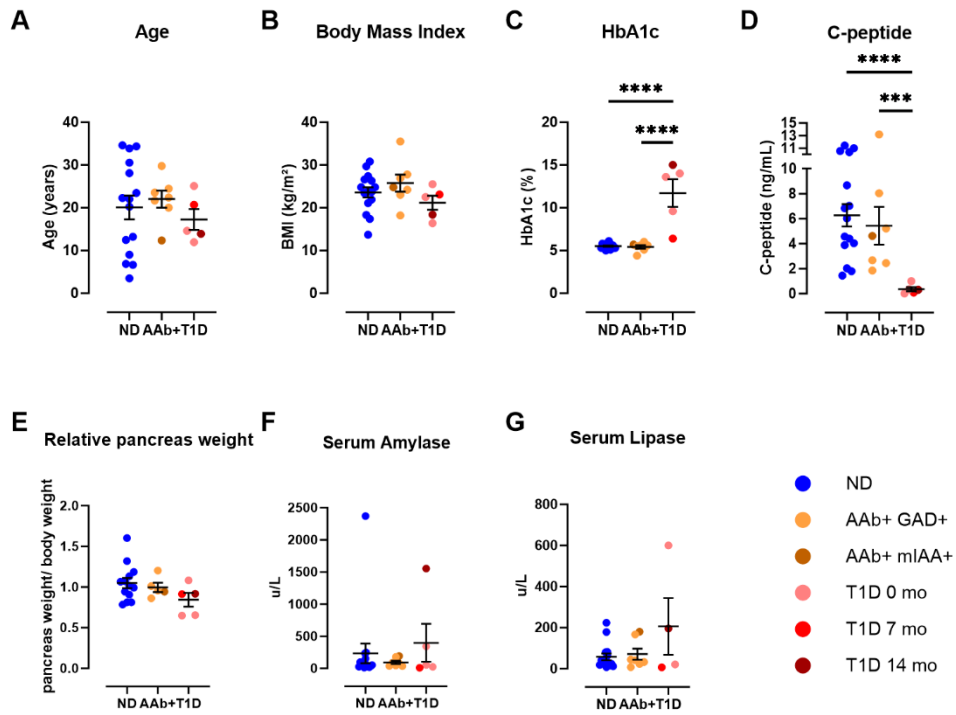


Figure S1. Characteristics of organ donors used for functional studies, Related to Table S1

Donor age (A), body mass index (B), hemoglobin A1c (C), serum C-peptide (D), relative pancreas weight (E) and serum amylase (F) and lipase (G) levels.

n=15 ND, 7 1AAb+ and 5 T1D donors

Dots represent individual donors shown with mean \pm SEM and one-way ANOVA of log-transformed data.

p<0.001; *p<0.0001.

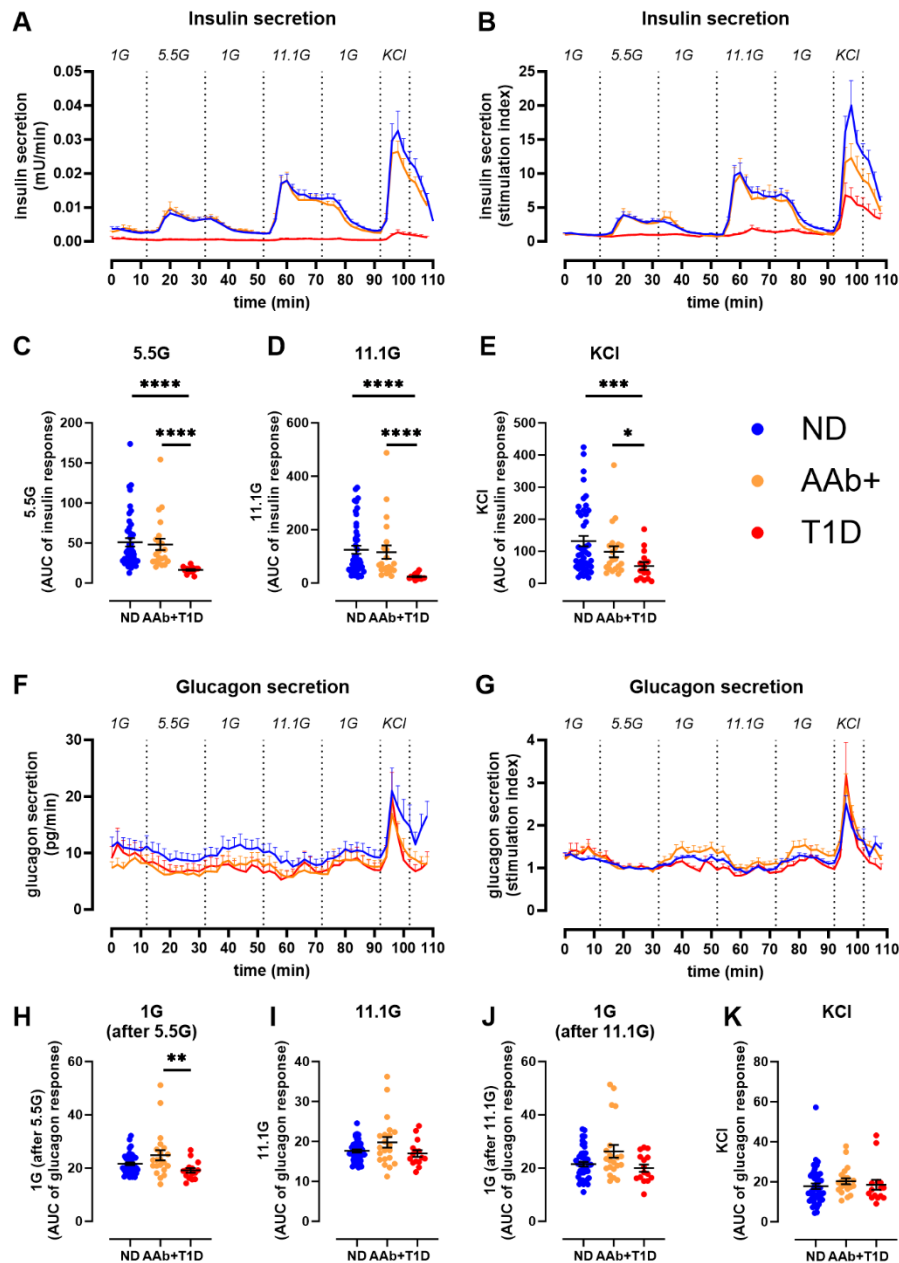


Figure S2. Insulin and glucagon secretion in AAb+ and recent-onset T1D, Related to Figure 2

A-B. Insulin secretion from slices of ND (blue), 1AAb+ (orange) and recent-onset T1D (red) donors (mean of pancreas head, body and tail) shown as absolute amounts (A) and stimulation index (fold of 1G baseline) (B).

C-E. Quantification of insulin responses to 5.5G (C), 11.1G (D), and KCl (E).

F-G. Glucagon secretion from slices of ND (blue), 1AAb+ (orange) and recent-onset T1D (red) donors (mean of pancreas head, body and tail) shown as absolute amounts (F) and stimulation index (fold of 5.5G baseline) (G).

H-K. Quantification of glucagon responses to 1G (H), 11.1G (I), 1G (J), and KCl (K).

n=15 ND, 7 1AAb+, 5 T1D donors, with 4 slices/region/donor

Dots represent individual donors shown with mean \pm SEM and one-way ANOVA of log-transformed data.

*p<0.05; **p<0.01; ***p<0.001; ****p<0.0001.

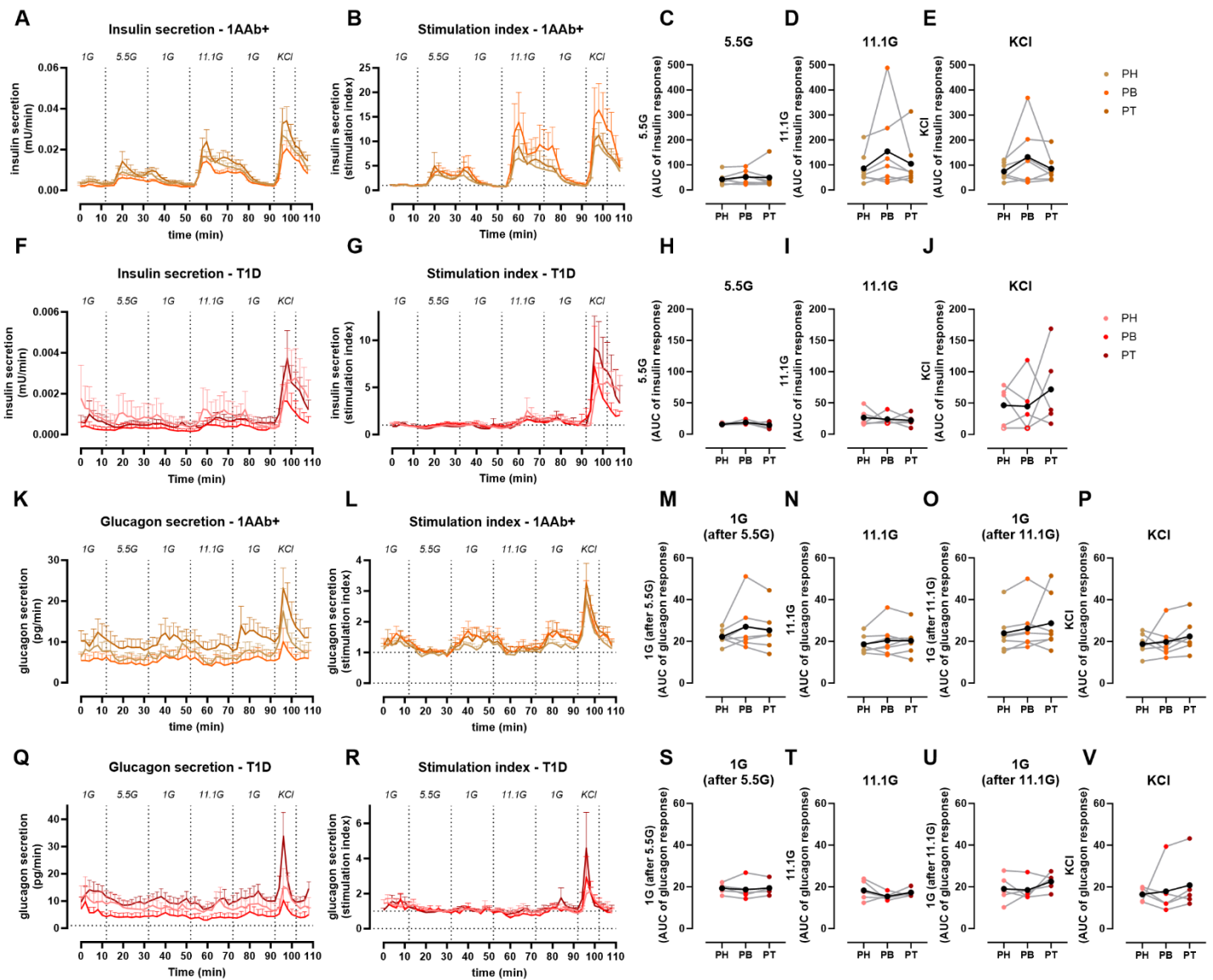


Figure S3. Insulin and glucagon secretion across all pancreas regions in AAb+ and recent-onset T1D, Related to Figure 2

A-B. Insulin secretion from slices of the pancreas head, body, and tail of 1AAb+ donors shown as absolute amounts (A) and stimulation index (fold of 1G baseline) (B).

C-E. Quantification of insulin responses to 5.5G (C), 11.1G (D), and KCl (E).

F-G. Insulin secretion from slices of the pancreas head, body, and tail of T1D donors shown as absolute amounts (F) and stimulation index (fold of 1G baseline) (G).

H-J. Quantification of insulin responses to 5.5G (H), 11.1G (I), and KCl (J).

K-L. Glucagon secretion from slices of the pancreas head, body and tail of 1AAb+ donors shown as absolute secreted amounts (K) and stimulation index (fold of 5.5G baseline) (L).

M-P. Quantification of glucagon responses to 1G (M), 11.1G (N), 1G (O), and KCl (P).

Q-R. Glucagon secretion from slices of the pancreas head, body and tail of T1D donors shown as absolute amounts (Q) and stimulation index (fold of 5.5G baseline) (R).

S-V. Quantification of glucagon responses to 1G (S), 11.1G (T), 1G (U), and KCl (V).

n=15 ND, 7 1AAb+, 5 T1D donors, with 4 slices/region/donor

Dots represent individual donors with mean \pm SEM and one-way ANOVA of log-transformed data.

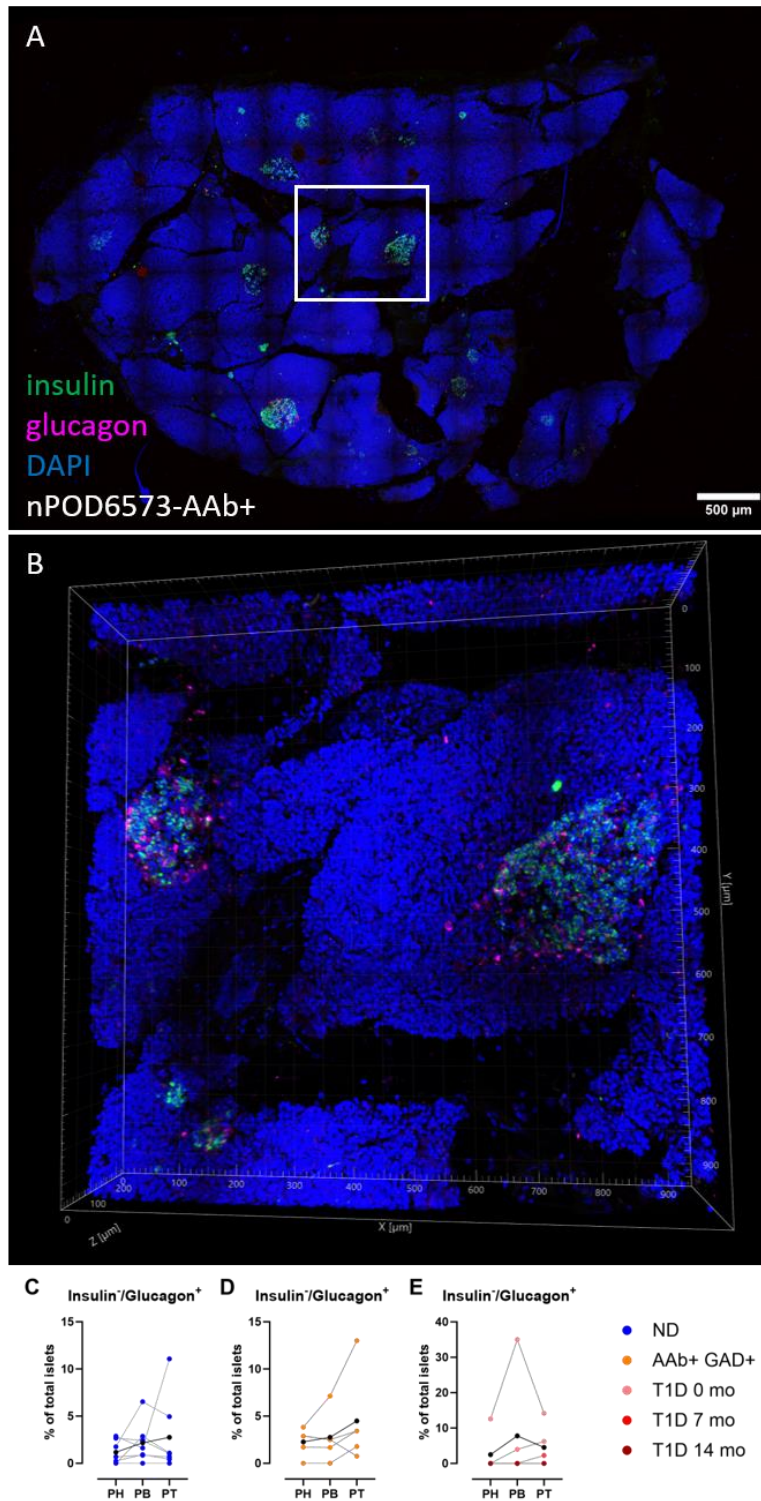


Figure S4. Example image of a perfused slice used for 3D morphometrical analysis, Related to Figure 4
 A-B. Maximum intensity projection of a whole pancreatic tissue slice (A) and 3D view of the squared in area (B) containing islets and acinar tissue from an AAb+ donor stained for insulin (green), glucagon (magenta) and nuclei (DAPI), scale bar=500 μ m.

C-D. Frequency of insulin/glucagon⁺ islets across PH, PB, PT in ND (C), 1AAb+ (D), T1D (E).

n= 7 ND, 5 1AAb+, 5 T1D, with 4 slices/region/donor

Dots represent individual donors with mean \pm SEM and one-way ANOVA of log-transformed data.