Supplemental Figure Legends

ESM Fig. 1. CD34 and CD31 immmunodetection of islet vessels. Pancreas sections were stained for CD34 and CD31 with SCG3 using OPAL as described in Methods for 3 control donors (N=10 islets/donor). A representative islet is shown for a 27 year old female donor without diabetes (A) with each channels shown below (B-D). Image analysis showed that CD34 detected a significantly greater islet vessel area (%) than CD31 (E, paired t-test, $p <$ 0.05)).

ESM Fig. 2. Islet vessel parameters by donor age. Pancreas sections were stained and image analysis performed as described in Methods for 16 control donors (N=10 islets/donor) and 17 donors with type 1 diabetes (N=7-20 islets/donor). Data are shown for control and diabetic donors with the same Y axis scale for graphs used between donor groups. Islet vessel diameter (A,D), density (B,E), and area (C,F) were not significantly correlated with age in control donors (10-27 years of age, A-C) or diabetic donors (11-29 years of age, D-F). Spearman correlation analysis, $p > 0.05$.

ESM Fig. 3. Islet sampling sizes. Islet vessel densities are shown for a representative control donor using 5 to 35 islets (A). Islet vessel densities are shown for 3 control donors and 3 diabetic donors for 10, 20, and 30 islets each donor. Mean islet vessel density (B) and diameter (C) were similar between 10-30 islets.

ESM Fig. 4. Vessels within the peri-islet exocrine regions. Pancreas sections were stained and image analysis performed as described in Methods for 16 control donors (N=7-8 peri-islet exocrine regions/donor) and 17 donors with type 1 diabetes (N=7-8 exocrine regions/donor). No significant differences were observed in peri-islet exocrine vessel parameters between control or diabetic donor groups (A-C). T-test, $p>0.05$.

ESM Fig. 5. Vessel diameter and density versus islet insulin area in diabetic donors. Sections were stained and analyzed as described in Methods for 7 donors with type 1 diabetes (N= 5-11 islets/donor; each donor is color coded). Correlation analysis was performed for INS+ islet vessel diameter (A) and density (B) as a function of islet insulin area (%) in donors with type 1 diabetes. No significant differences were observed between vessel diameter (A) and density (B) compared to islet insulin area. Spearman correlation analysis, $p > 0.05$.
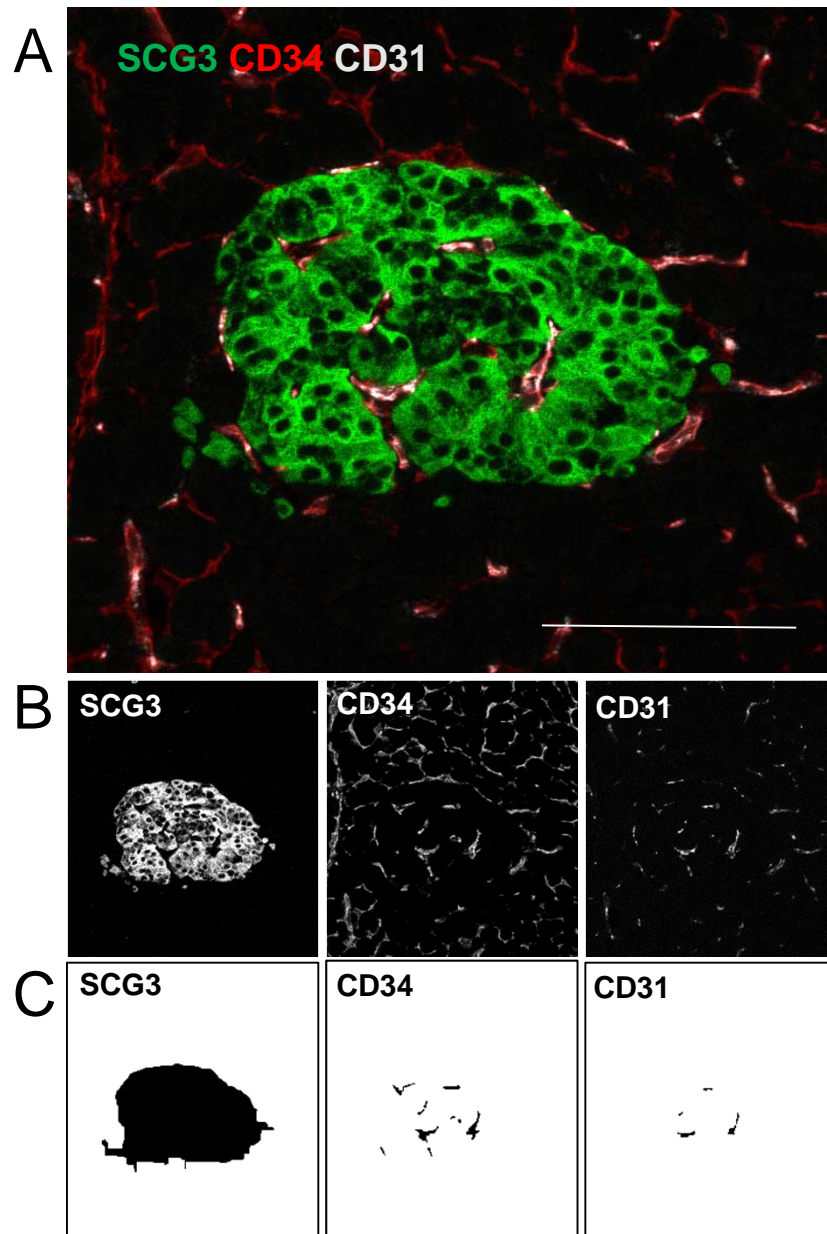
ESM Fig. 6. Vessel diameter and density in INS+ islets with insulitis. Sections were stained and analyzed as described in Methods for 8 donors with type 1 diabetes. Insulitic islets were identified in 5 donors with type 1 diabetes (N= 5-6 islets of CD3+/- subtype/donor). Sections were stained for SCG3 (green), SMA (yellow), insulin (blue), and CD34 (red)(a,b) and SCG3 (green), CD3 (yellow), and insulin (blue)(c). Representative islets are shown from 3 diabetic donors for CD3- (a) and CD3+ subtypes (b, c). Red arrowheads denote CD3+ cells in islets (c). Paired lines are shown for each donor for vessel diameter (d) and density (e) by islet CD3+/- subtype. Some islets with insulitis were included regardless of shape due to low numbers per section. No significant differences were observed by islet CD3+/- status. Paired t-test, $p>0.05$.

ESM Table 1. Type 1 diabetes donor islet and exocrine vessel parameters. Donors are shown by donor type (No Diabetes, Type 1 Diabetes) with total islet numbers (# islets) and islet subtype numbers based on insulin and insulitis detection as described in Methods. Islet vessel parameters and SMA area are provided in Table 1A. Exocrine vessel parameters and SMA area are provided in Table 1B. NA, not available.

CaseID	# Islets	# INS+ CD3-	# INS+ CD3+	# INS-CD3-	Total area (μm^2)	Vessel Diameter (μm)	Vessel Density ($10^4/\mu m^2$)	Vessel area (%)	SMA area (%)
Table 1A: Islet									
No Diabetes									
6057	10	10	0	0	26,764	7.0	4.5	6.9	4.3
6091	10	10	0	0	17,891	7.1	5.8	8.4	7.2
6099	10	10	0	0	20,759	6.6	6.4	8.9	3.4
6160	10	10	0	0	13,584	5.5	4.5	5.1	6.7
6179	10	10	0	0	15,325	8.3	5.1	10.3	5.2
6227	10	10	0	0	25,318	8.4	4.9	10.2	8.0
6232	10	10	0	0	18,041	7.6	5.3	8.3	2.7
6233	10	10	0	0	25,040	7.4	6.0	9.0	7.0
6238	10	10	0	0	18,470	9.2	5.3	13.3	5.0
6271	10	10	0	0	16,918	6.8	5.3	7.5	5.0
6279	10	10	0	0	14,899	8.2	5.0	7.8	2.7
6282	10	10	0	0	27,237	9.4	4.5	11.5	2.7
6317	10	10	0	0	24,898	7.4	6.1	9.2	3.8
6318	10	10	0	0	17,926	8.1	5.2	9.2	2.3
6333	10	10	0	0	12,713	8.4	5.1	9.9	6.0
6358	10	10	0	0	19,636	6.0	5.5	5.8	1.8
Counts	160	160							
Mean					19,714	7.6	5.3	8.8	4.6
SD					1,193	1.1	0.6	2.0	2.0
Type 1 Diabetes									
6046	10	5	0	5	12,691	5.7	13.3	10.9	NA
6049	10	0	0	10	15,046	6.0	8.4	8.2	3.5
6064	10	0	0	10	13,945	6.0	9.4	8.8	6.8
6070	17	6	5	6	27,793	5.9	8.1	7.8	8.5
6083	10	0	0	10	16,252	5.3	10.4	8.7	5.8
6089	8	0	0	8	16,837	5.8	9.6	10.2	6.0
6195	10	0	0	10	11,818	6.2	9.4	9.6	5.0
6237	9	0	0	9	12,483	5.4	12.0	9.4	3.8
6243	14	4	5	5	14,173	6.8	8.6	10.7	2.4
6245	15	5	5	5	13,166	6.6	8.8	10.8	5.2
6264	10	0	0	10	10,103	6.2	11.2	12.9	5.9
6265	7	0	0	7	7,639	5.9	9.9	8.4	3.8
6321	10	0	0	10	13,364	5.8	11.1	9.7	7.8
6324	10	0	0	10	11,612	5.2	10.0	6.8	10.3
6325	14	9	0	5	26,324	7.2	5.7	8.6	2.3
6362	15	5	6	4	54,300	7.1	6.2	10.5	11.2
6396	20	8	7	5	19,421	8.3	6.7	12.9	7.7
Counts	199	42	28	129					
Mean					17,469	6.2	9.3	9.7	6.0
SD					2,627	0.8	0.2	1.7	2.6

CaseID	Exocrine Area (µm2)	SMA Area (µm^2)	SMA Area (%)	Vessel Diameter (µm)	Vessel Density (10^4/µm^2)	Vessel area (%)
Table 1B: Exocrine						
No Diabetes						
6057	120,422	10,744	8.8	5.6	10.0	11.0
6091	131,453	9,524	7.3	5.2	11.5	9.6
6099	128,585	2,953	2.3	5.4	10.1	10.0
6160	135,761	7,206	5.4	5.2	8.1	6.6
6179	131,807	7,272	5.6	5.8	8.0	10.0
6227	124,026	12,118	9.9	5.9	9.4	11.4
6232	131,303	4,284	3.3	5.2	9.5	8.8
6233	121,552	3,255	2.7	5.5	9.1	8.8
6238	130,874	6,614	5.1	5.3	9.7	9.4
6271	132,427	4,391	3.3	5.6	8.5	9.8
6279	128,541	2,860	2.3	5.4	9.7	8.8
6282	121,043	4,458	3.8	5.1	11.9	11.2
6317	124,446	2,596	2.1	5.6	7.8	8.4
6318	131,418	1,589	1.2	5.7	8.8	10.1
6333	120,190	11,300	8.6	5.7	8.6	9.9
6358	119,837	4,134	3.5	5.4	9.6	9.3
Counts	112					
Mean	127,105	5,956	4.7	5.5	9.4	9.6
SD	5,344	3,288	2.6	0.2	1.1	1.1
Type 1 Diabetes						
6049	134,833	2,431	1.8	5.2	11.3	9.2
6064	120,003	1,677	1.4	5.7	8.7	9.2
6083	135,399	4,048	3.0	5.6	10.3	10.3
6089	119,365	14,619	12.5	5.8	6.9	8.0
6195	133,092	3,428	2.6	5.5	8.7	9.1
6237	132,508	3,210	2.5	5.3	10.6	9.4
6264	127,838	3,732	2.9	5.6	9.4	9.1
6265	129,484	1,711	1.4	5.6	9.1	9.3
6321	135,171	2,453	1.8	5.9	11.2	12.9
6324	114,887	7,565	6.9	5.8	9.5	9.9
6046	124,044	4,065	3.2	5.6	8.6	8.1
6325	112,603	1,549	1.4	6.0	9.0	11.1
6070	123,470	5,057	4.1	5.6	9.8	9.9
6243	133,947	11,022	8.2	5.6	11.3	11.5
6245	116,382	6,635	5.8	5.8	8.9	11.0
6362	95,044	13,514	15.0	5.8	9.4	11.0
6396	129,923	16,733	13.3	5.3	7.9	9.0
Counts	119					
Mean	124,588	6,085	5.2	5.6	9.4	9.9
SD	10,745	4,900	4.5	0.2	1.2	1.2

A SCG3 CD34 CD31

B SCG3 | CD34 | CD31

C SCG3 | CD34 | CD31

ESM Fig. 1

Control

A

B

C

Type 1 Diabetes

D

E

F
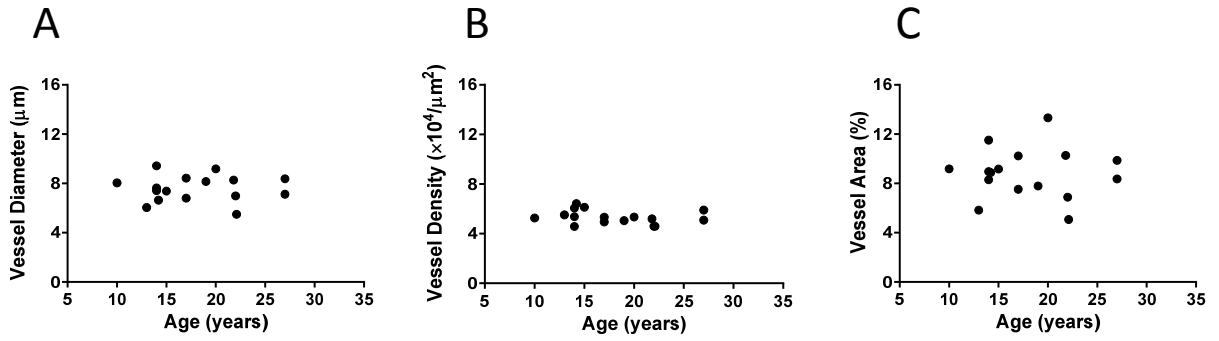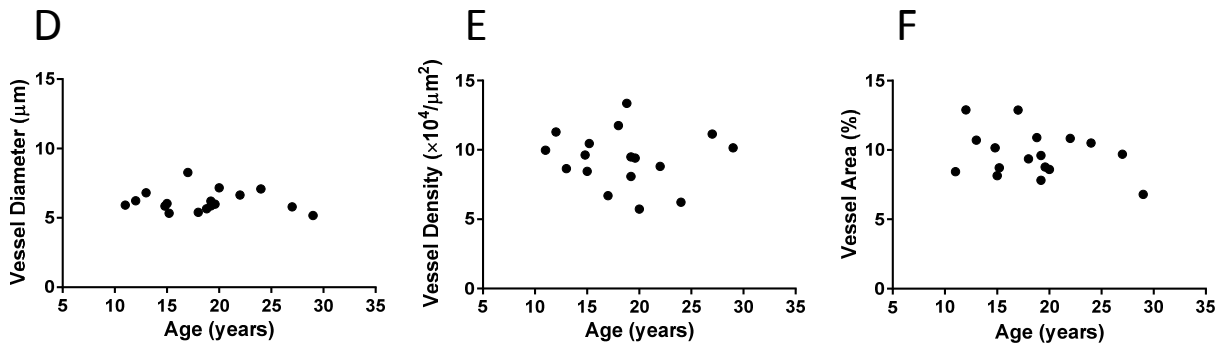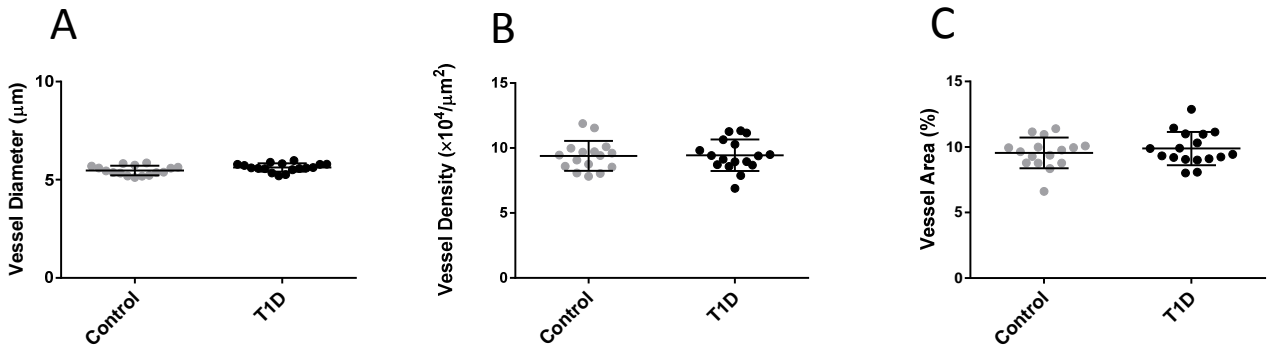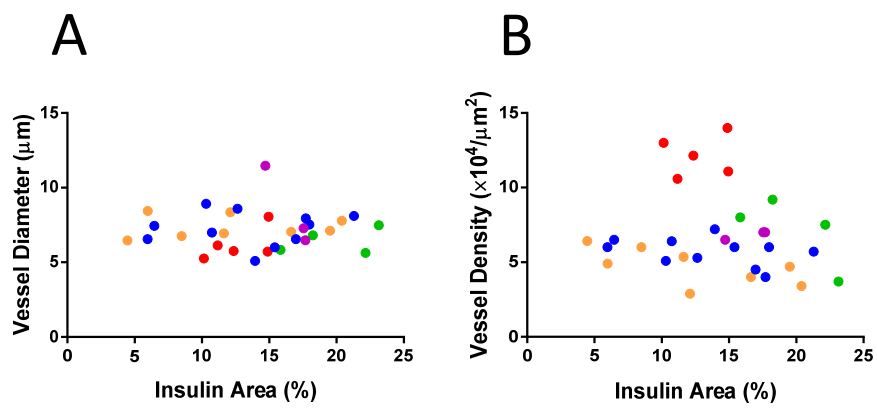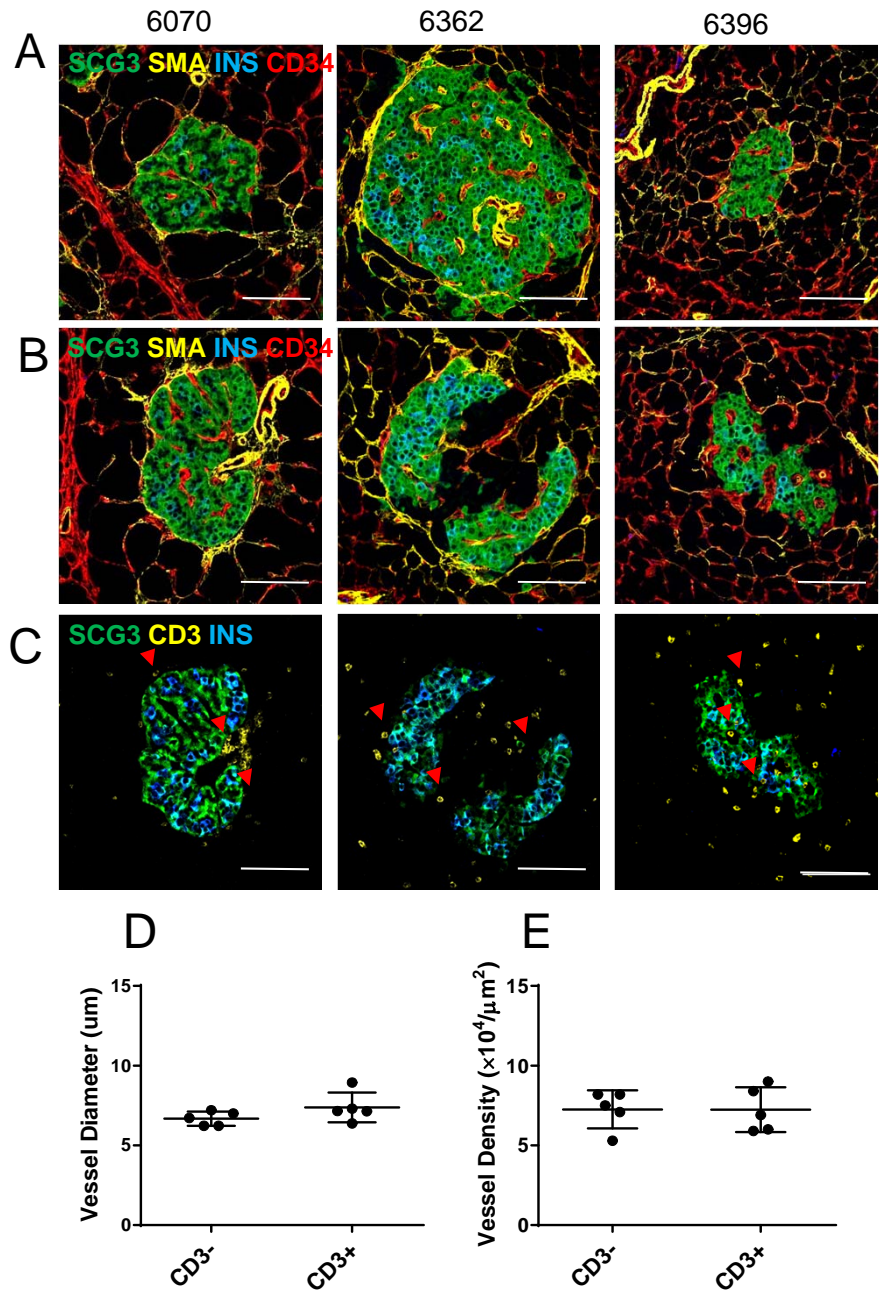

ESM Fig. 2.

ESM Fig. 3.

ESM Fig.4

A

B

ESM Fig. 5.

ESM Fig. 6.