**Integrated pancreatic blood flow: Bi-directional microcirculation between endocrine and exocrine pancreas**

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**Supplementary Materials**

Table S1. Summary of three islet circulation models.

Video 1. Fluorescent dextran flow through a mouse islet for Fig.2A.a.

Video 2. Fluorescent red blood cell (RBC) flow through a mouse islet for Fig.2A.b.

Video 3. Fluorescent red blood cell (RBC) flow through a mouse islet for Fig.2B.a.

Video 4. Fluorescent image of beta-cells (green) with computer-generated spheres tracking the movement of each individuals RBC for Fig.2B.b.

Video 5. Computer-generated spheres showing path of RBC movement through tailing for Fig.2B.b.

Video 6. The overall pathways generated by accumulated tailing for Fig.2B.c.

Video 7. Fluorescent image of beta-cells overlaid with a heatmap showing mean RBC speed determined by computer generated spheres (blue) for Fig.2B.d.

Video 8. Fluorescent RBC flow through a mouse islet for Fig.3A.a. left.

Video 9. Fluorescent image of beta-cells overlaid with a heatmap showing mean RBC speed determined by computer generated spheres for Fig.3A.a.*middle*.

Video 10. Fluorescent RBC flow through a mouse islet for Fig.3A.b.*left*.

Video 11. Fluorescent image of beta-cells overlaid with a heatmap showing mean RBC speed determined by computer generated spheres for Fig.3A.b.*middle*.

Video 12. Fluorescent RBC flow through a mouse islet for Fig.3B.a.*left*.

Video 13. Fluorescent image of beta-cells overlaid with a heatmap showing mean RBC speed determined by computer generated spheres for Fig.3B.a.*middle*.

Video 14. Fluorescent RBC flow through a mouse islet for Fig.3B.b.*left*.

Video 15. Fluorescent image of beta-cells overlaid with a heatmap showing mean RBC speed determined by computer generated spheres for Fig.3B.b.*middl*e.

Video 16. Three-dimensional view of a pancreatic islet (cyan), surrounding vasculature

(red), and afferent arteriole (yellow), 3D rendered from fluorescent microscopy of a thick

pancreatic slice from a 24 year old male donor for Fig.5A.

Supplementary Figure S1.

**Characteristics of pancreatic capillary networks in patients with T2D. A.** A single islet from a patient with T2D from a 44 year old female. T2D duration for 15 years. **a.** Fluorescent image of islet (HPi1 in yellow) and blood vessels (CD31 in red). Scale bar: 100 μm. **b.** 3D rendering of a. Scale bar: 100 μm. **c.** Enlarged view of the islet and surrounding blood vessels. Scale bar: 50 μm. **d.** Blood vessels only, showing continuity between endocrine and exocrine vasculature. Scale bar: 50 μm. **B.** Two islets that have clustered adjacent to one another in a 37 year old female. T2D duration for 10 years. Scale bar: **a, c.** 100 μm. **b, d**. 80 μm.