

Supplemental Information for

**Online fluorescence anisotropy immunoassay for monitoring insulin
secretion from islets of Langerhans**

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Table S-1. Parameters of the finite element simulation.

Temperature (T)	320.15 K
Viscosity (η)	$1 \times 10^{-3} \text{ N s m}^{-2}$
Density (ρ)	$1 \times 10^3 \text{ kg m}^{-3}$
Linear Velocity (V)	0.21 mm s^{-1}
Glucose Diffusion Coefficient (D)	$9 \times 10^{-9} \text{ m}^2 \text{ s}^{-1}$
[Glucose] initial	3 mol m^{-3}
[Glucose] step	20 mol m^{-3}

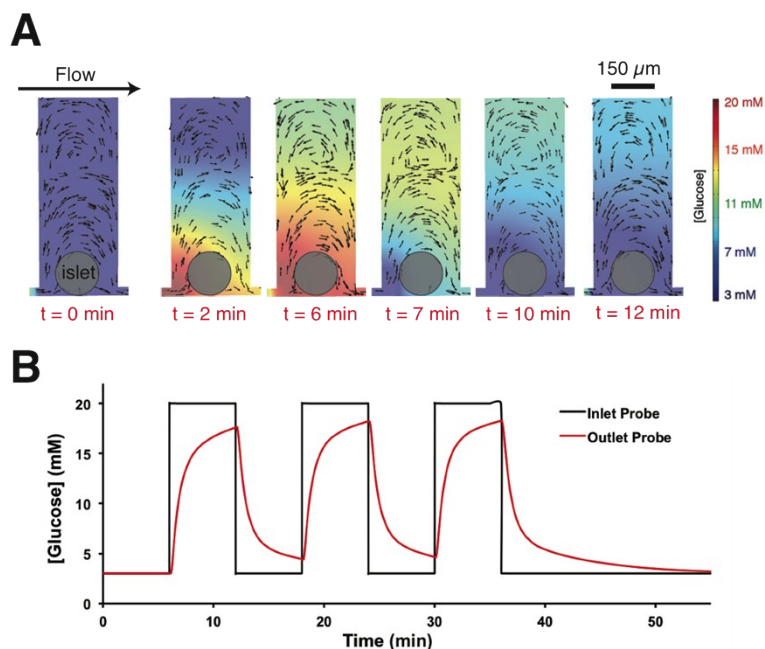


Figure S-1. Finite element simulation of flow through the islet chamber. (A) The snapshots show the cross section of the islet chamber with an islet shown as a grey sphere in the bottom-center. Flow occurs from left to right and the glucose concentration is shown in color with blue equivalent to 3 mM and red corresponding to 20 mM (scale bar on right). At time 0 (left image), a high glucose concentration is just entering the inlet of the islet chamber, which is the small channel at the bottom left of the image. As time progresses, the glucose pulse fills the chamber and exits through the channel on the bottom right. The arrows indicate the streamlines within the chamber. **(B)** The observed glucose concentrations at the inlet (black) and outlet (red) channels are shown to indicate how the chamber contributes to the increased response time of the system. The simulation snapshots shown in **A** correspond to the data of the first pulse shown in **B**.

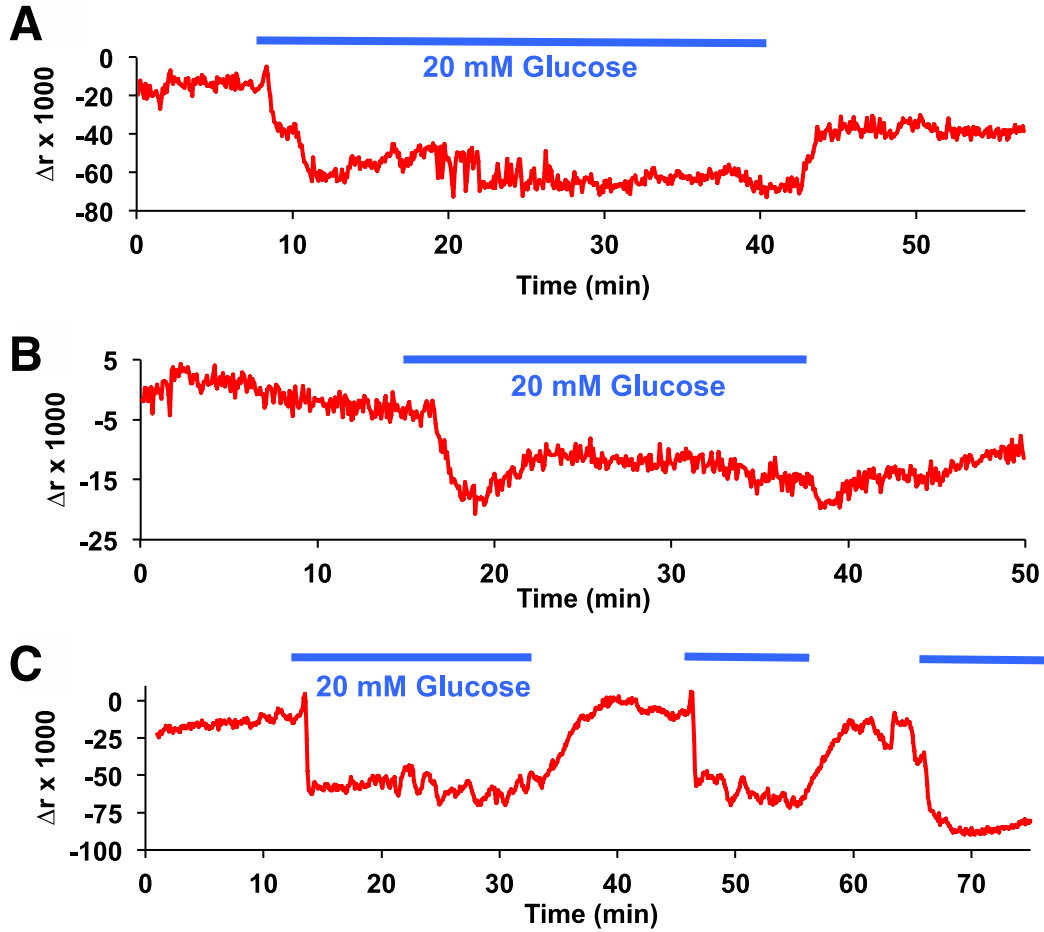


Figure S-2. Additional single islet traces. The measured anisotropy values (red) from three additional islets are labeled A, B, and C. The glucose level applied to the islets was 3 mM except during the periods of time shown by the horizontal blue bars when 20 mM glucose was delivered. During elevated glucose, the measured anisotropy decreased, which indicates an increase in the amount of measured insulin.