

## Supplementary Information

### A Photonic Glucose Biosensor for Chronic Wound Prognostics

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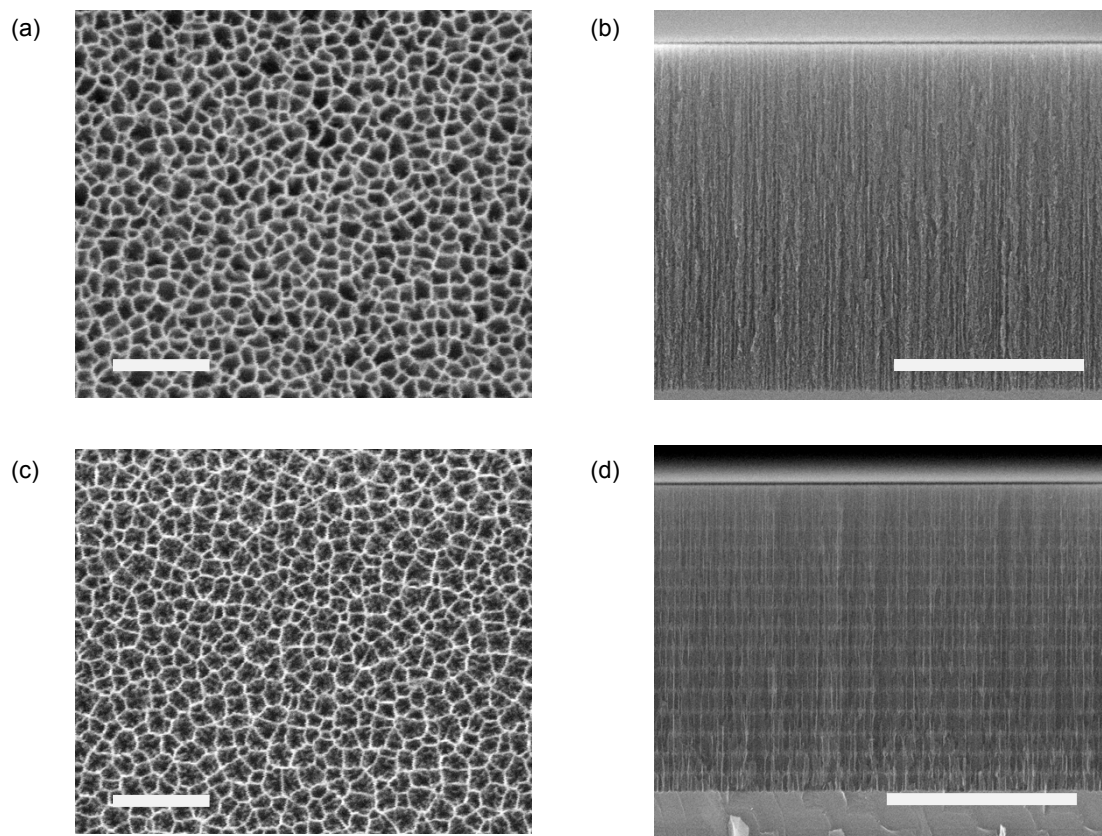


Figure S1. SEM images of the single layer pSi and pSiRF used as sensing platforms. (a) Top view and (b) cross-section of the optimum condition of single layer pSi etched at current density  $5.7 \text{ mA/cm}^2$  for 810 s (Surface 2). (c) Top view and (d) cross-section of pSiRF etched for 15 periods at current density sinusodially cycled between  $5.7 \text{ mA/cm}^2$  and  $28.3 \text{ mA/cm}^2$ . The scale bar in (a) and (c) indicates 100 nm while the scale bar in (b) and (d) indicates  $1 \text{ }\mu\text{m}$ .

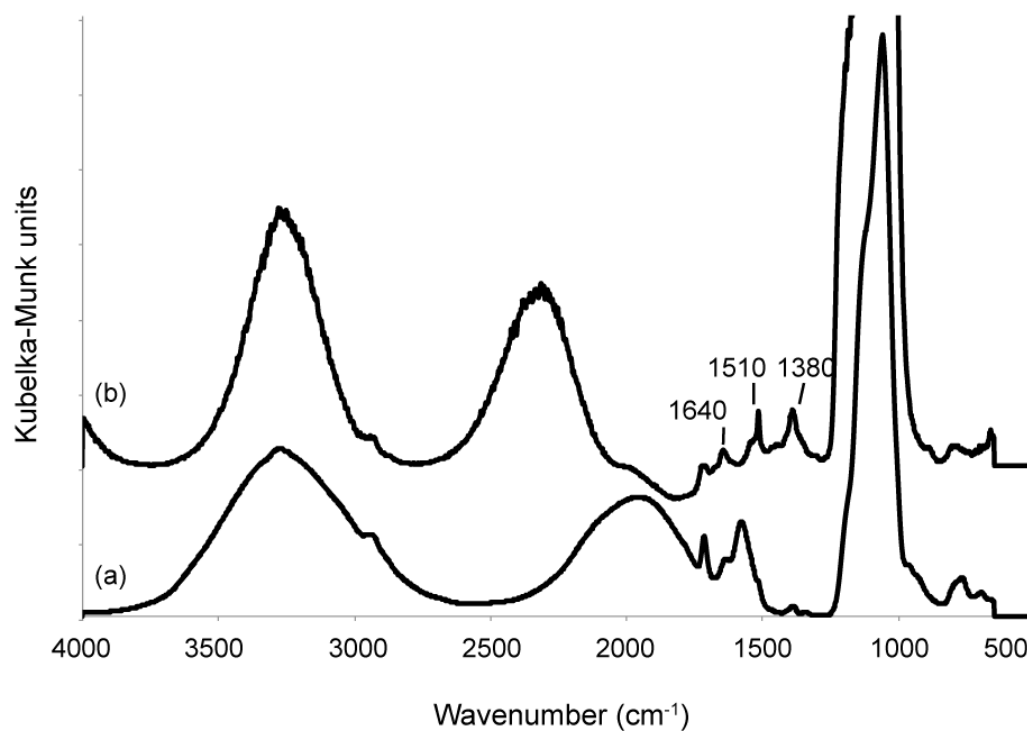


Figure S2. Infrared spectra of pSi surface after (a) maleimide reaction and (b) PDMA-SH attachment. The band at  $1640\text{ cm}^{-1}$  in spectrum (b) is characteristic for carbonyl group of PDMA and peaks at  $1510\text{ cm}^{-1}$  and  $1380\text{ cm}^{-1}$  correspond to C-H alkane bending vibrations.

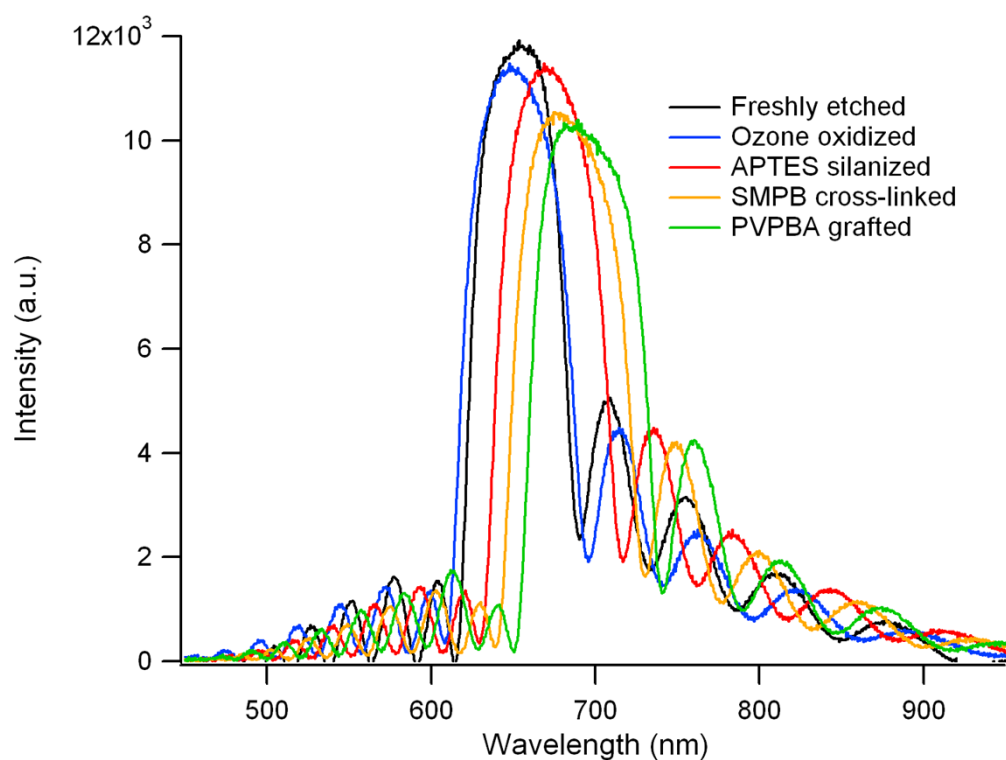


Figure S3. Reflectance spectra of pSiRF monitored during surface functionalization reactions, indicating the refractive index changes during each modification step.

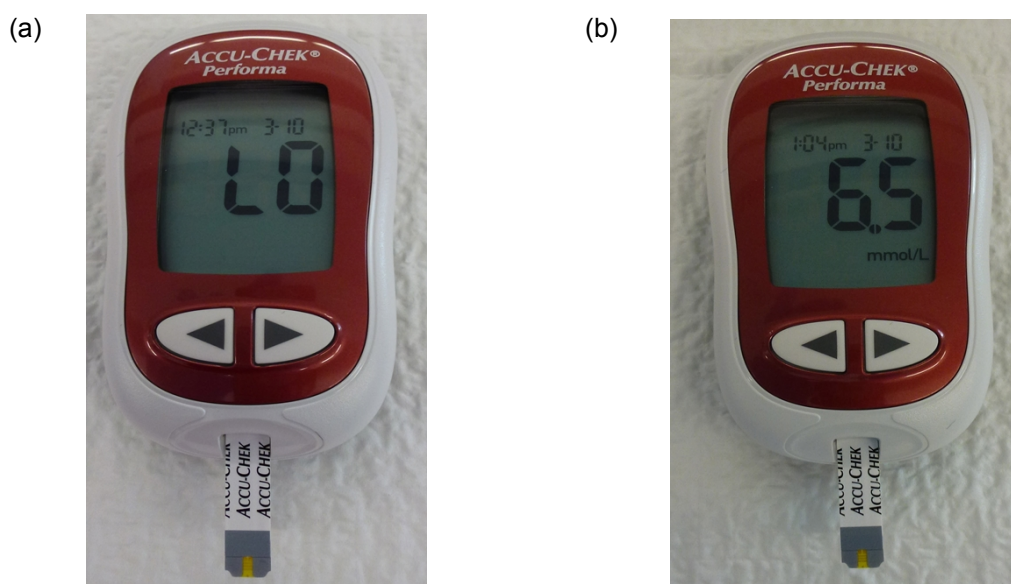


Figure S4. Glucose detection for wound fluid sample using a commercially available glucose meter; (a) wound fluid and (b) 10-fold dilution wound fluid spiked with 10 mM of glucose.

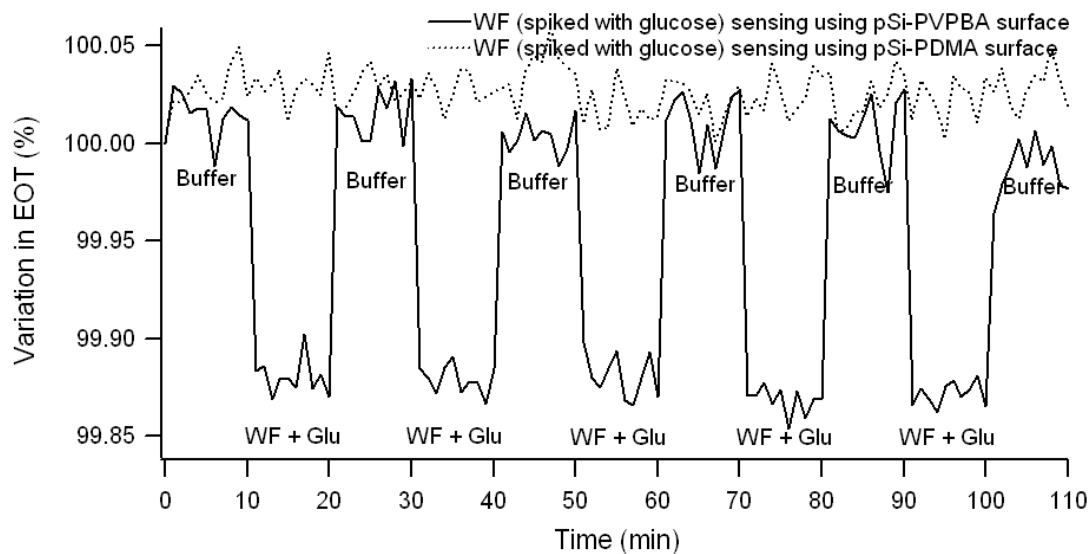


Figure S5. Sensorgram of the pSi-PVPBA surface and pSi-PDMA as a control surface when exposed to buffer solution pH 7.4 and wound fluid sample at physiological pH spiked with 10 mM glucose.

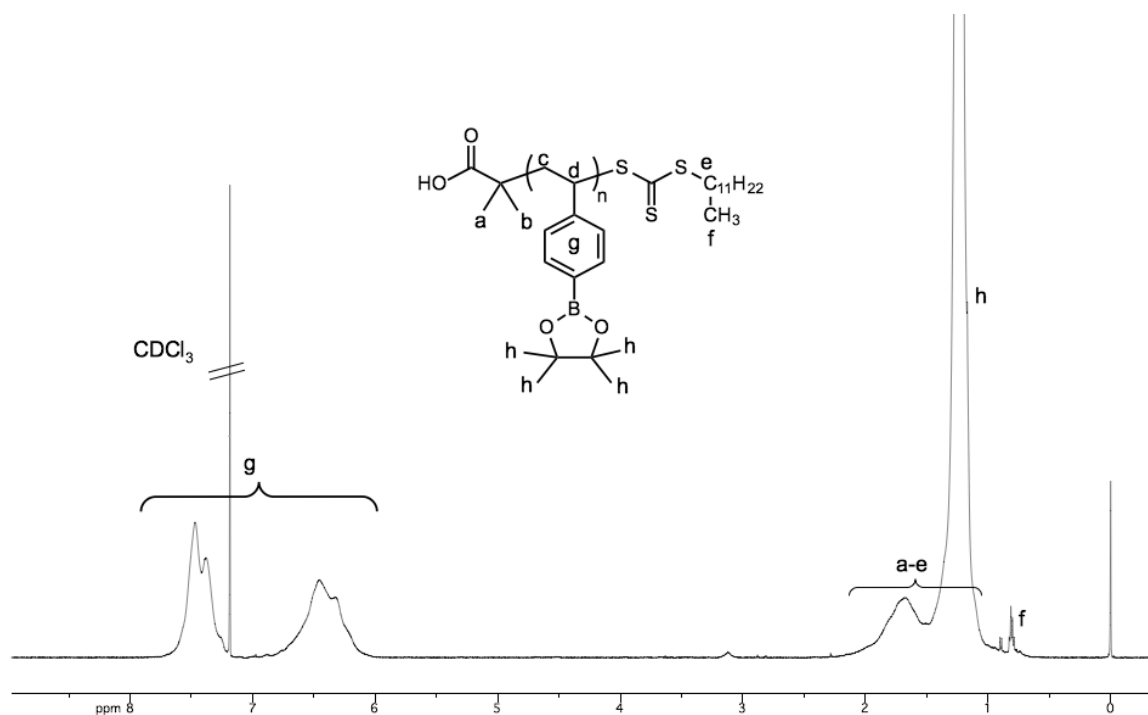


Figure S6.  $^1\text{H}$  NMR of PVPBAE in  $\text{CDCl}_3$ .

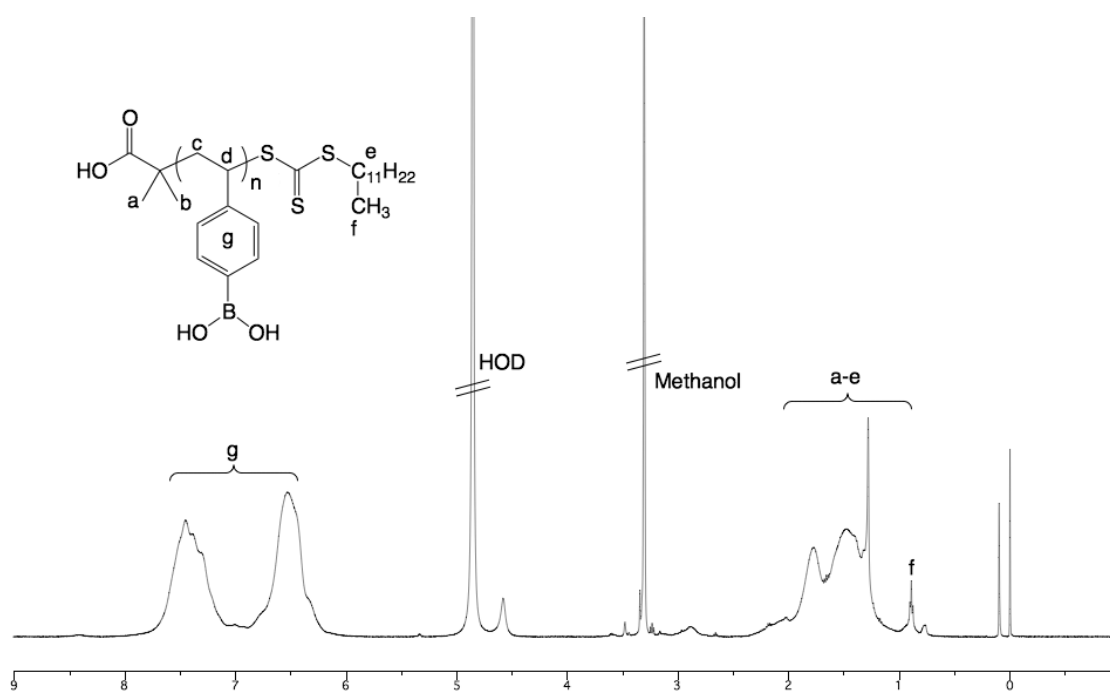


Figure S7. <sup>1</sup>H NMR of PVPBA in MeOD.

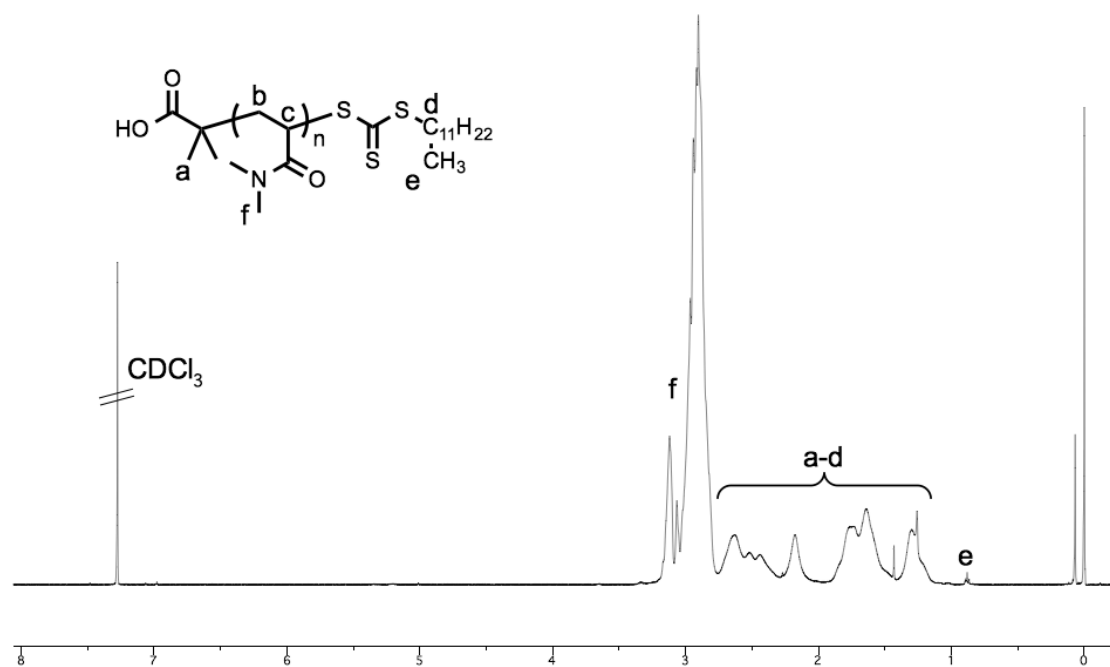


Figure S8. <sup>1</sup>H NMR of PDMA in CDCl<sub>3</sub>.

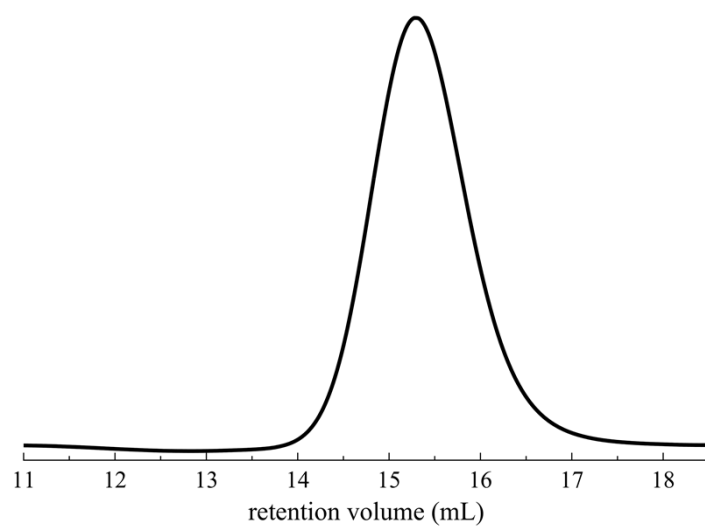


Figure S9. Size exclusion chromatography trace of PVPBAE.

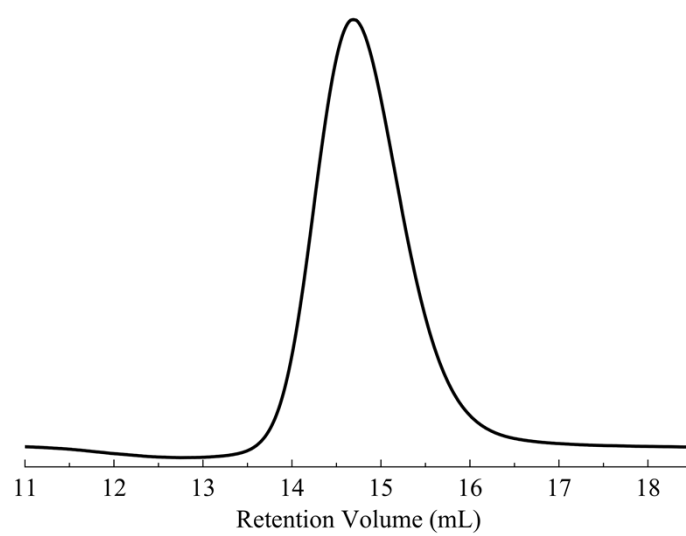


Figure S10. Size exclusion chromatography trace of PDMA.