

Electronic Supplementary Information

Surface engineered contact lens for tear fluid biomolecule sensing

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Table S1. Concentrations of various tear constituents. (*The upper limit of the concentration range was used for selectivity study.*)

Tear Constituent	Concentration ¹
Lactoferrin	0.63 – 2.9 mg/ml
Lysozyme	2.5 – 3.4 mg/ml
Albumin	6.0 – 15.2 mg/ml (<i>normal</i>) 67 – 150 mg/ml (<i>ocular diseases</i>)
Glucose	1.0 – 6.2 mg per 100 ml (<i>normal</i>) 7.2 – 26 mg per 100 ml (<i>diabetes</i>)
Na ⁺	80 – 170 mM
K ⁺	6 – 42 mM
Ca ²⁺	0.3 – 2.0 mM

¹ Yamada, K.; Takaki, S.; Komuro, N.; Suzuki, K.; Citterio, D., *Analyst* 2014, 139 (7), 1637-1643. DOI 10.1039/C3AN01926H.

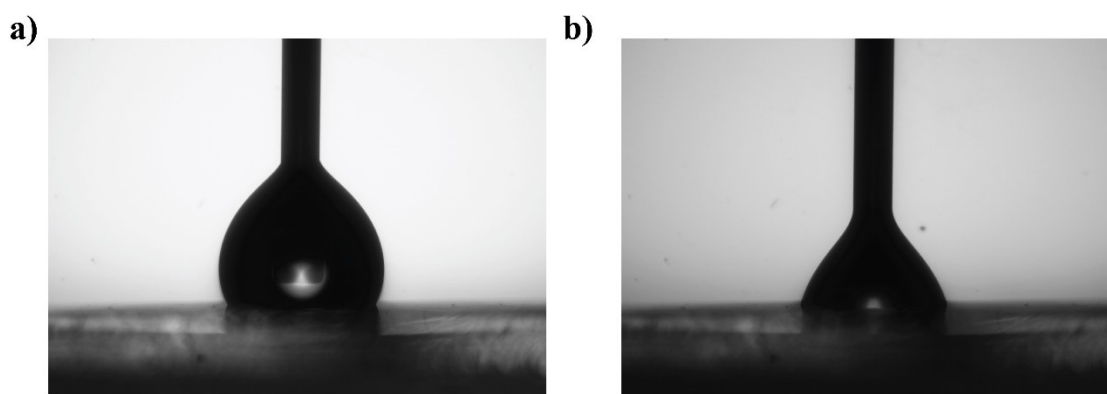


Fig. S1. a) Advancing and b) receding contact angle of pristine PDMS surface.

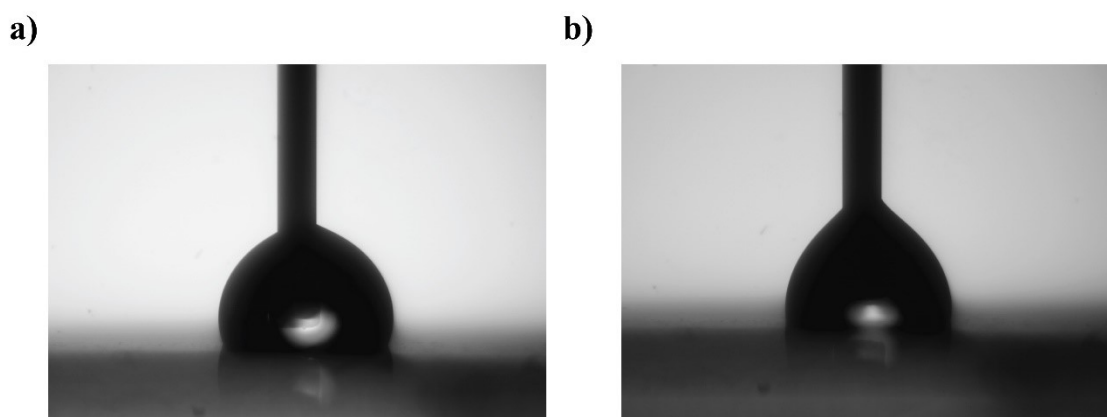


Fig. S2. a) Advancing and b) receding contact angle of oil grafted PDMS surface.

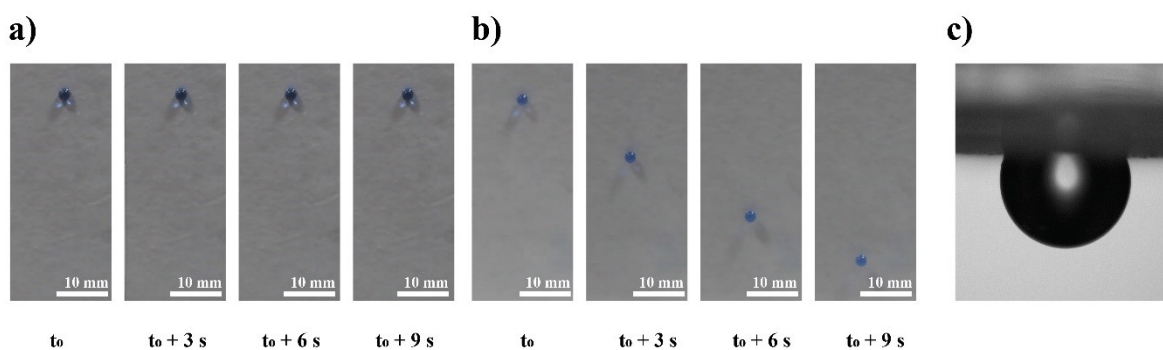


Fig. S3. A 10 μ l water droplet on a vertically kept a) Pristine PDMS, b) uniformly oil-grafted PDMS surface, and c) A 10 μ l water droplet in pristine PDMS tilted upside down.

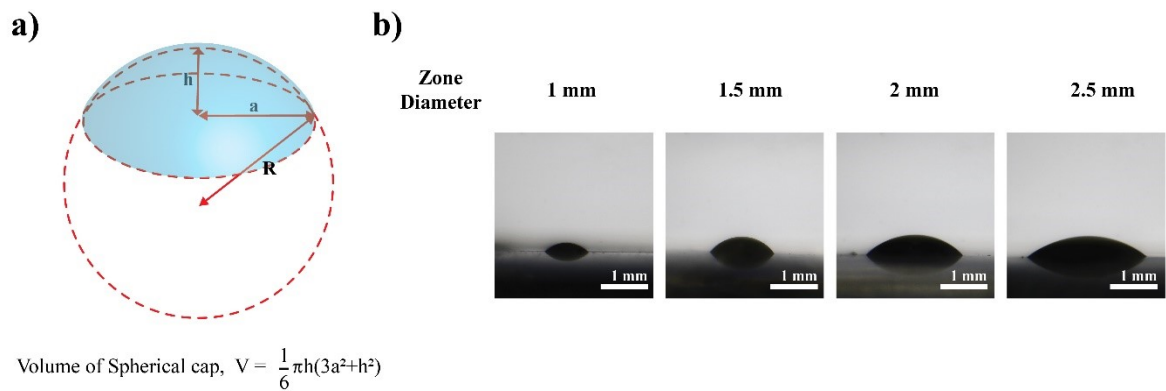


Fig. S4. a) Schematic of spherical cap and b) Droplet after splitting on zones of various dimensions.

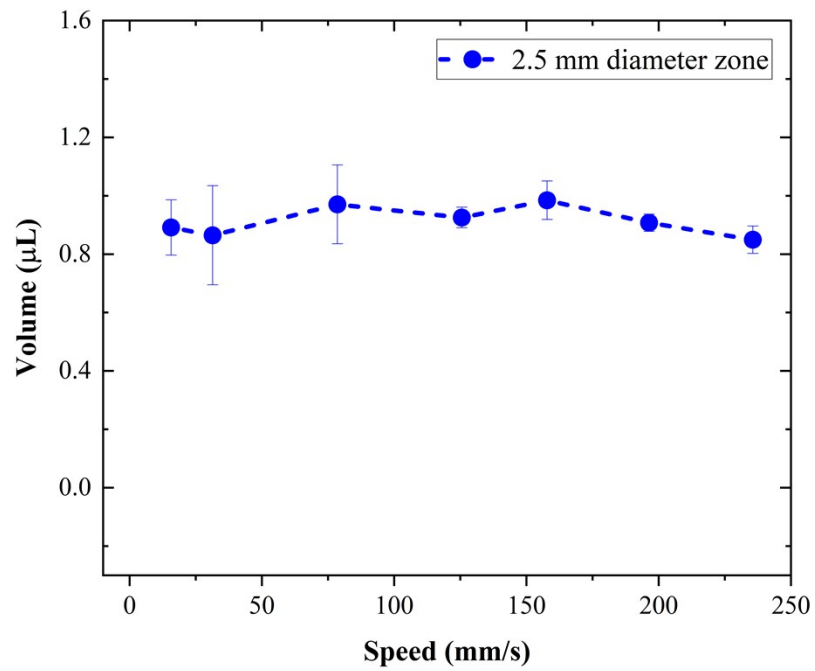


Fig. S5. The volume split on an adhesive contrast contact lens at various speed.

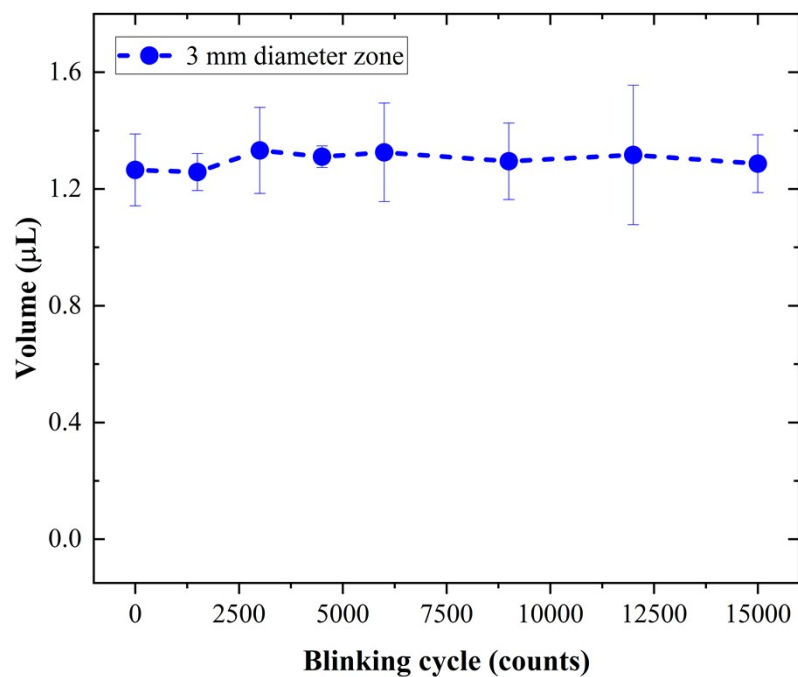


Fig. S6. The stability test, the adhesive contrast surface was ascended and descended into a water bath at speed nearly 80 mm/s.

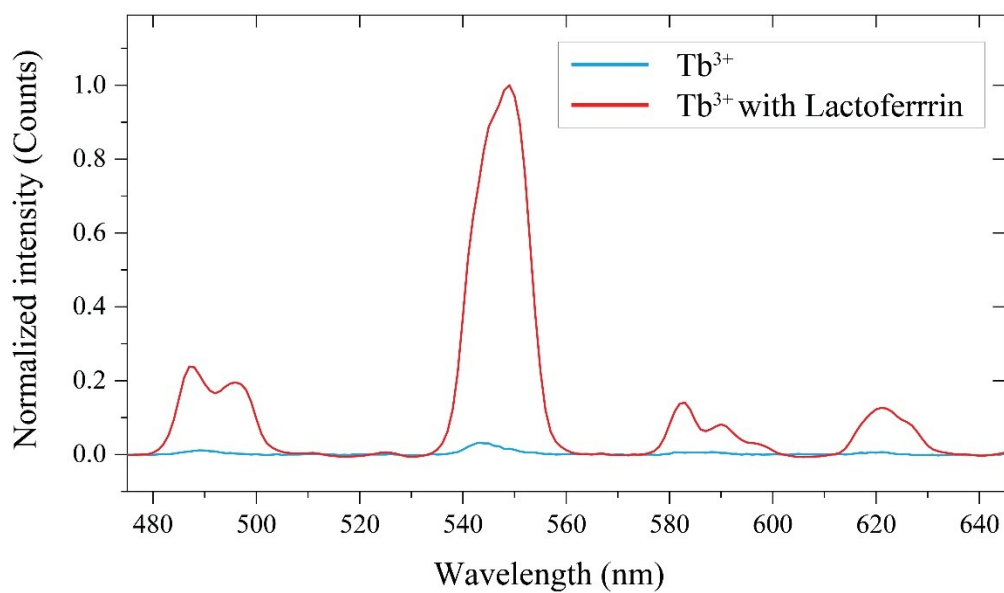


Fig. S7. Fluorescence emission spectra of 1 mM $TbCl_3$ solutions (50 mM TRIS, pH 7.4) in the absence and presence of human lactoferrin with UV excitation.

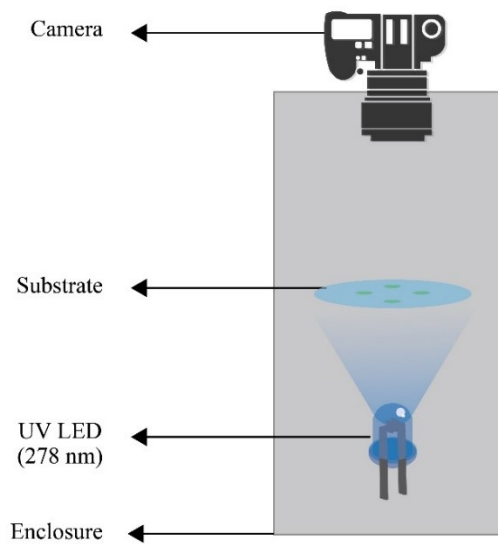


Fig. S8. Schematic of experimental setup for the colorimetric detection of lactoferrin on the adhesive contrast surface.

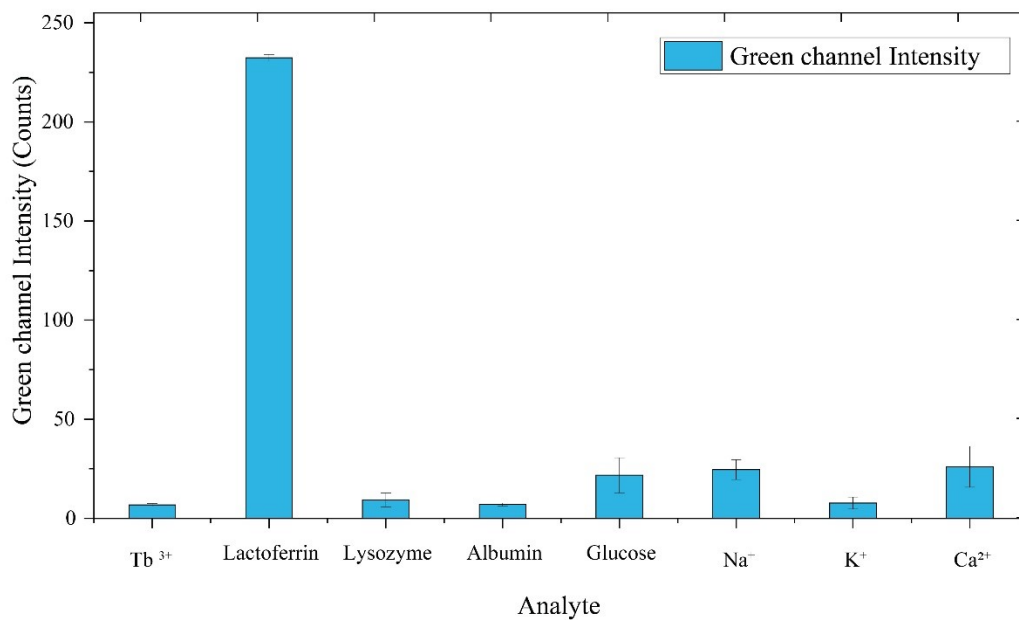


Fig. S9. Selectivity study showing the response of various tear constituents, concentrations as shown in Table S1.