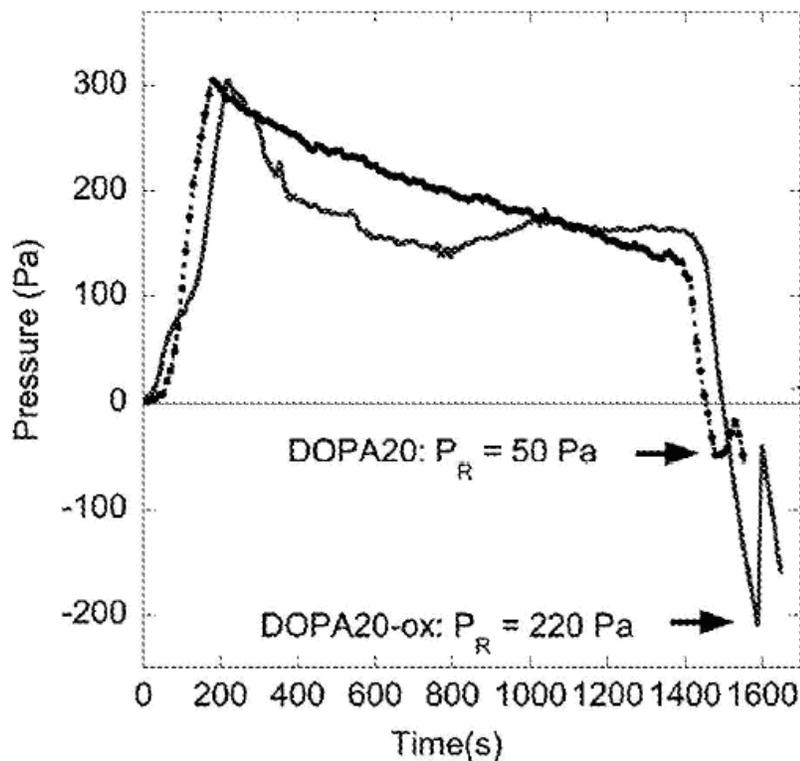
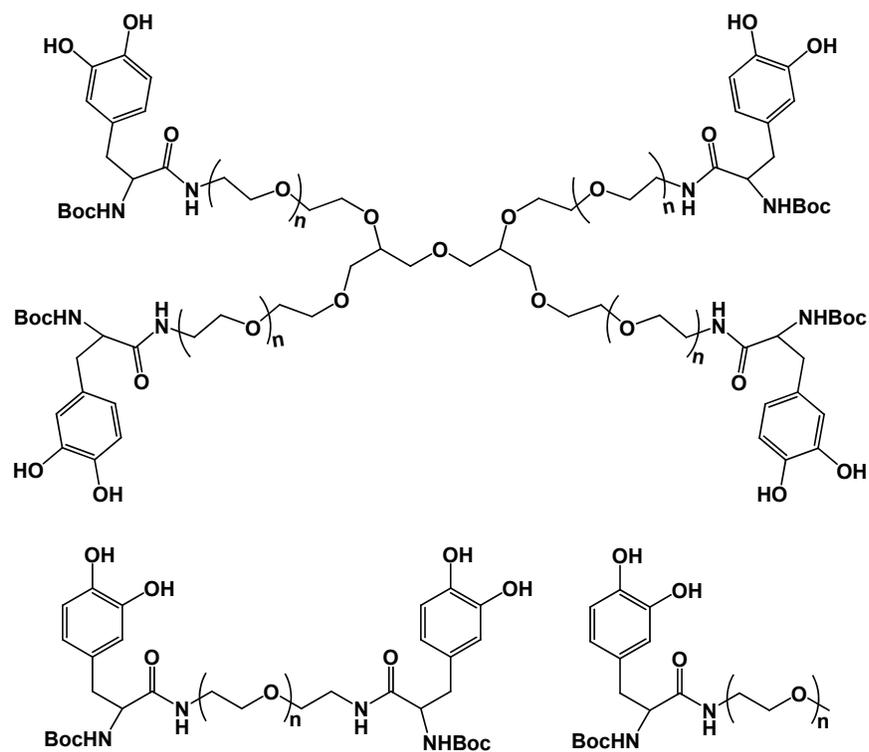


MUSSEL-INSPIRED ADHESIVES AND COATINGS

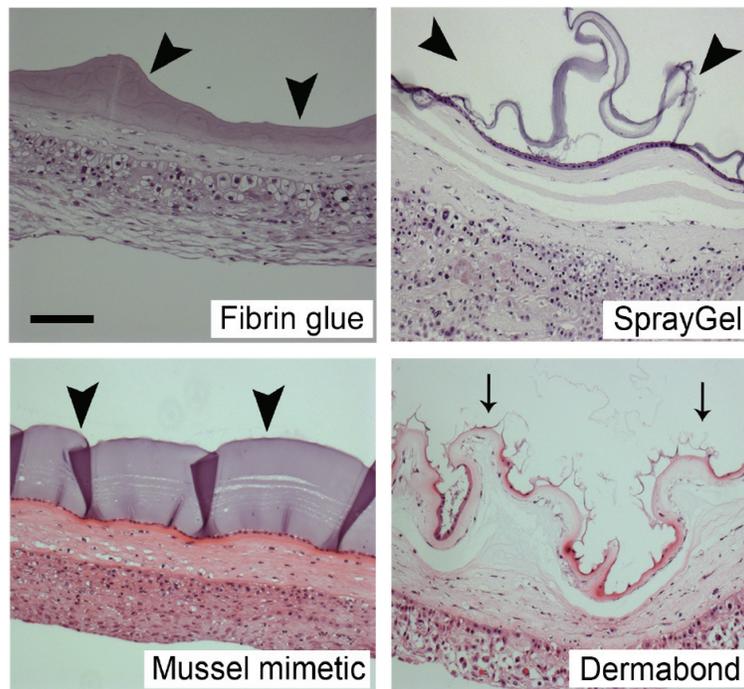
B.P. Lee, P.B. Messersmith, J.N. Israelachvili, and J.H. Waite



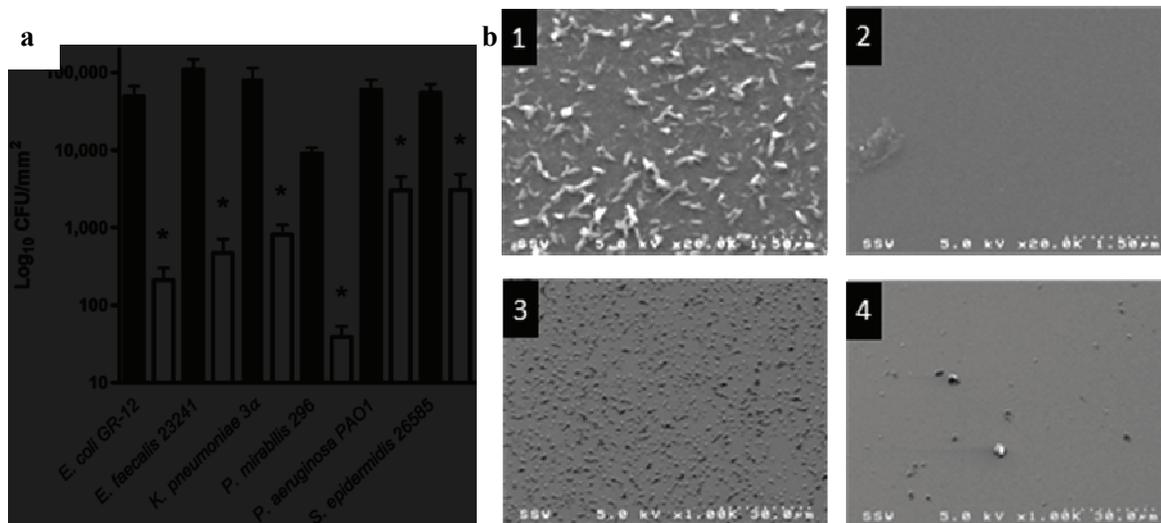
Supplemental Figure 1. Measured pressure of Dopa-modified membrane (DOPA20) contacting pig skin with DOPA20-ox denoting a polymer membrane oxidized while in contact with the substrate. The membranes were pressurized to make contact with the substrate (positive pressure), remained in contact for 20 minutes, and then released under reduced pressure. The magnitude of the negative release pressure (P_R) represents the level of adhesive interaction between membrane and the substrate (2).



Supplemental Figure 2. Chemical structures of linear and branched Dopa-modified PEG (1).



Supplemental Figure 3. Histologic assessment of tissue bonding and biological response of candidate bioadhesives (3). Each material was applied on the amniotic site of fresh discarded fetal membranes and placed in organ culture for 24 hours before histological processing. The images are of hematoxylin and eosin-stained cross-sections of fetal membranes. Fat arrows mark the hydrogels, thin arrows mark the damage to the amnion layer by Dermabond. Note the poor tissue adhesion of the PEG-based SprayGel in contrast to the uniform adhesion of PEG-catechol adhesive. Bar size: 100 μm .



Supplemental Figure 4. (a) Adherence of uropathogens to uncoated (black bars) and mPEG-Dopa₃-coated (white bars) TiO₂ surfaces following 24 hours of bacterial challenge in human pooled urine at a starting inoculum of 10⁵ CFU/mL. *denotes p < 0.05. (b) Scanning electronic microscopy (SEM) image of uncoated and PEG-DOPA₃-coated titanium surfaces after 24-hour incubation with pooled human urine (**panels 1** and **2**, respectively). SEM images of uncoated and coated surfaces challenged with *S. epidermidis* are shown in **panels 3** and **4**, respectively (4).

Supplemental Literature Cited

1. Lee BP, Dalsin JL, Messersmith PB. 2002. Synthesis and gelation of DOPA-modified poly(ethylene glycol) hydrogels. *Biomacromolecules* 3(5):1038–47
2. Guvendiren M, et al. 2009. Adhesion of DOPA-functionalized model membranes to hard and soft surfaces. *J. Adhes.* 86:631–45
3. Brubaker CE, et al. 2010. Biological performance of mussel-inspired adhesive in extrahepatic islet transplantation. *Biomaterials* 31:420–27
4. Ko R, et al. 2008. Novel uropathogen-resistant coatings inspired by marine mussels. *J. Endourol.* 2(6):1153–60