Electronic Supplementary Material (ESI) for Lab on a Chip.

Small Intestinal Sampling Capsule for Inflammatory Bowel Disease Type Detection and Management

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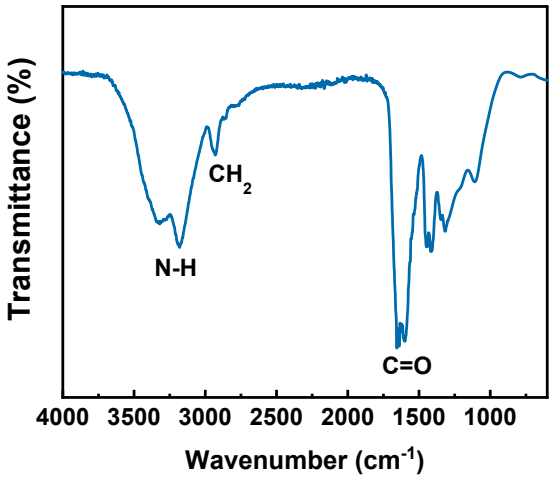

Fig. S1. ATR-FTIR spectrum of the dried hydrogel.

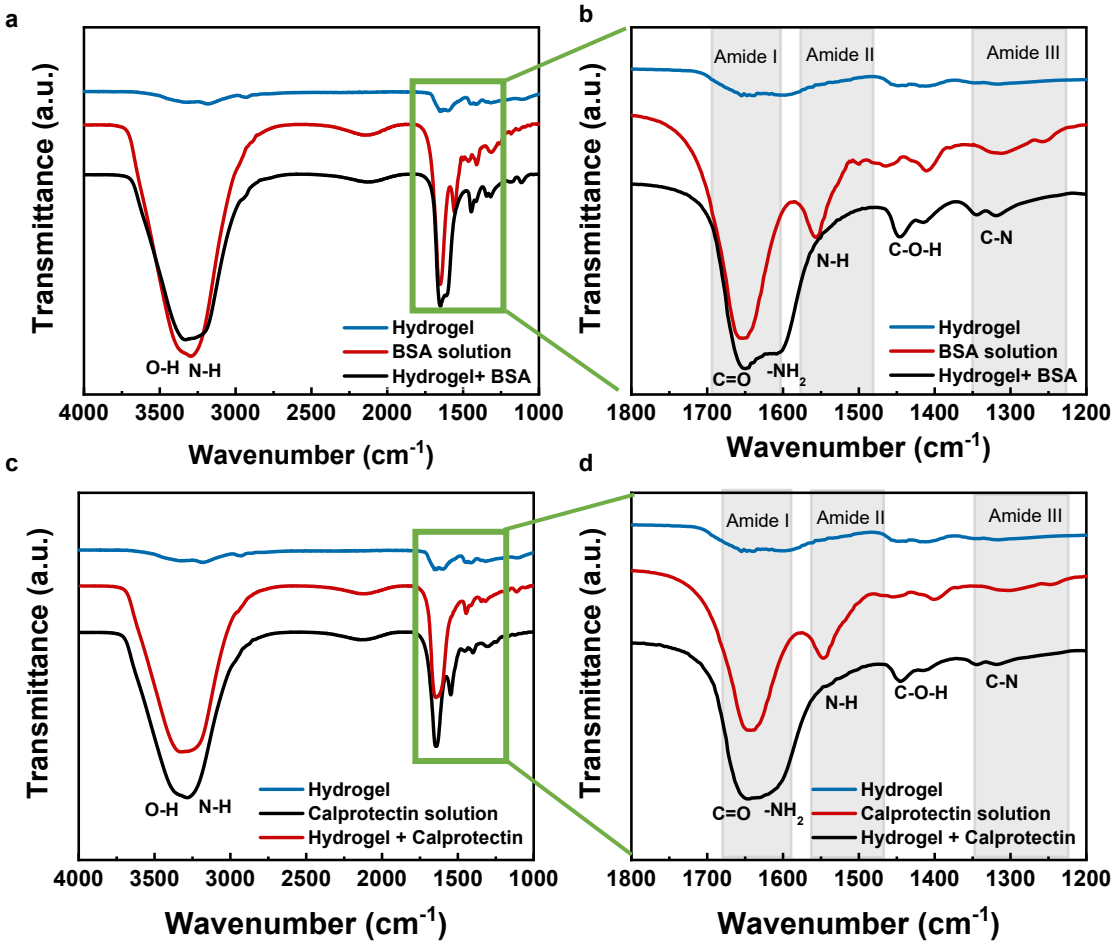

Fig. S2. ATR-FTIR analysis for **(a,b)** dried hydrogel, BSA solution, and hydrated hydrogel in BSA solution, **(c,d)** dried hydrogel, calprotectin solution, and hydrated hydrogel in calprotectin solution.

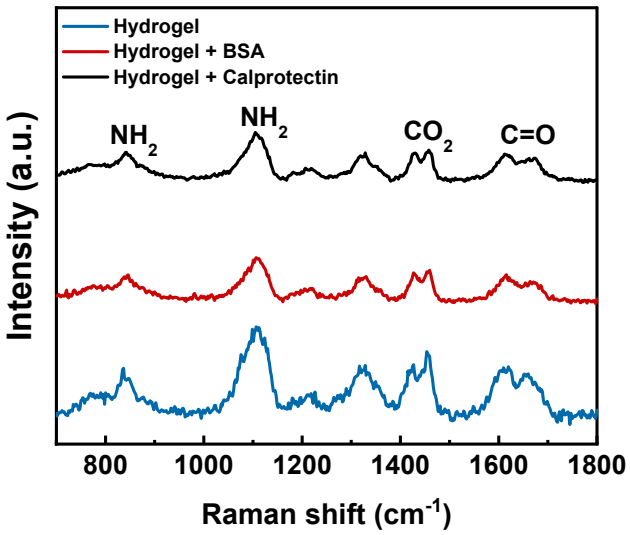

Fig. S3. Raman spectra of as prepared and dried hydrogel and hydrated hydrogels in solutions containing BSA and calprotectin.

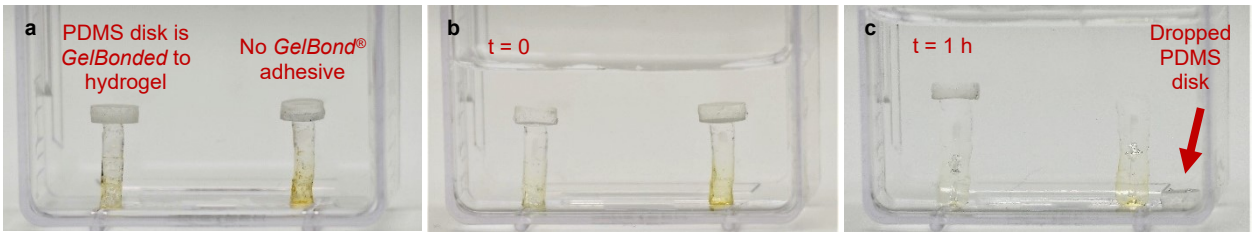

Fig. S4. Hydrogel swelling direction and effect of GelBond® on sealing mechanism. **(a)** shows two hydrogels with and without GelBond® adhesive between PDMS disk and hydrogel prior to submersion in pH 6.8 buffer solution. **(b)** after submersion, both PDMS disks are properly standing on top of the hydrogels at t=0. **(c)** however, after 1 h, it is shown that both hydrogels were straightly swollen with almost no sign of distortion while the PDMS disk with no adhesive dropped from the hydrogel surface, whereas the PDMS disk with the adhesive was strongly adhered to the hydrogel enabling a perfect sealing mechanism.

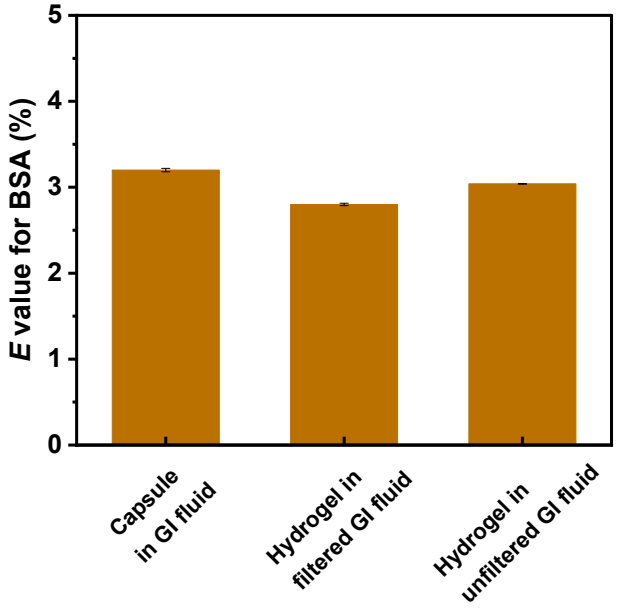

Fig. S5. The BSA extraction concentration relative to the sampling environment concentration known as BSA E value. The results are consistent among capsule in GI fluid, hydrogel in filtered GI fluid, and hydrogel in unfiltered GI fluid.

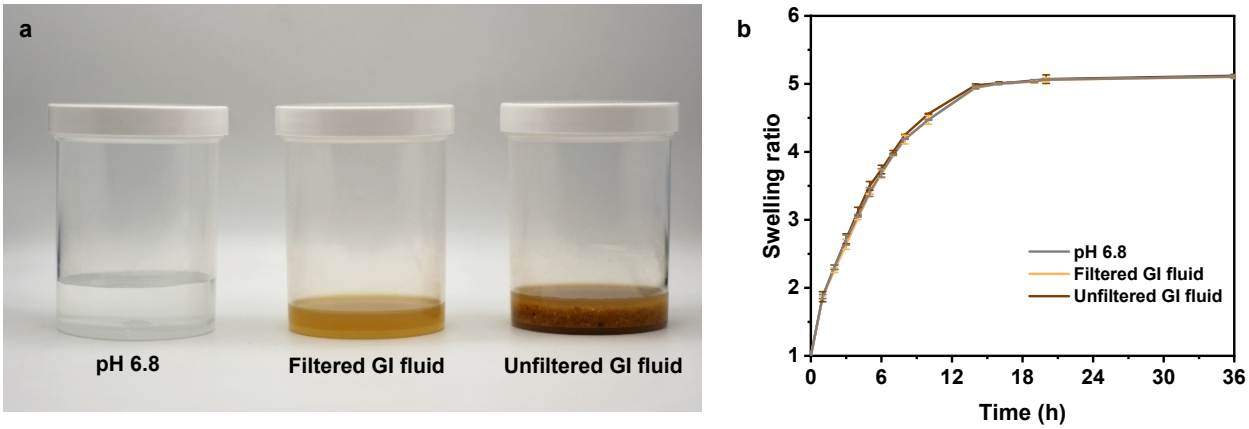

Fig. S6. (a) from left to right, containers filled with pH 6.8 buffer solution, filtered GI fluid, and unfiltered GI fluid. **(b)** swelling profile of the hydrogel inside, pH 6.8 buffer solution, filtered GI fluid, and unfiltered GI fluid.