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An autonomous self-healable, moldable and bioactive biomaterial gum: a potential candidate for personalised wearable drug delivery

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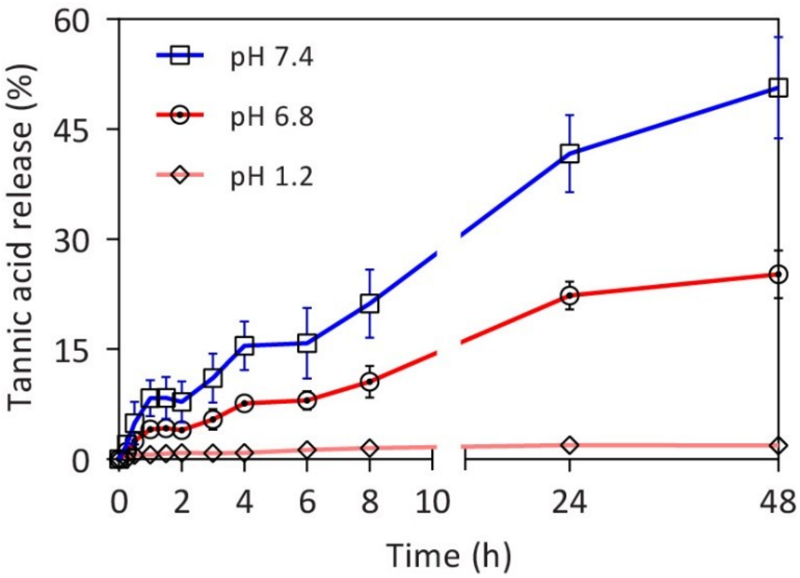

Figure S1. TA-release profile from PATA. The release rate of TA was highly pH-dependent and significantly higher at a neutral vs. acidic pH.

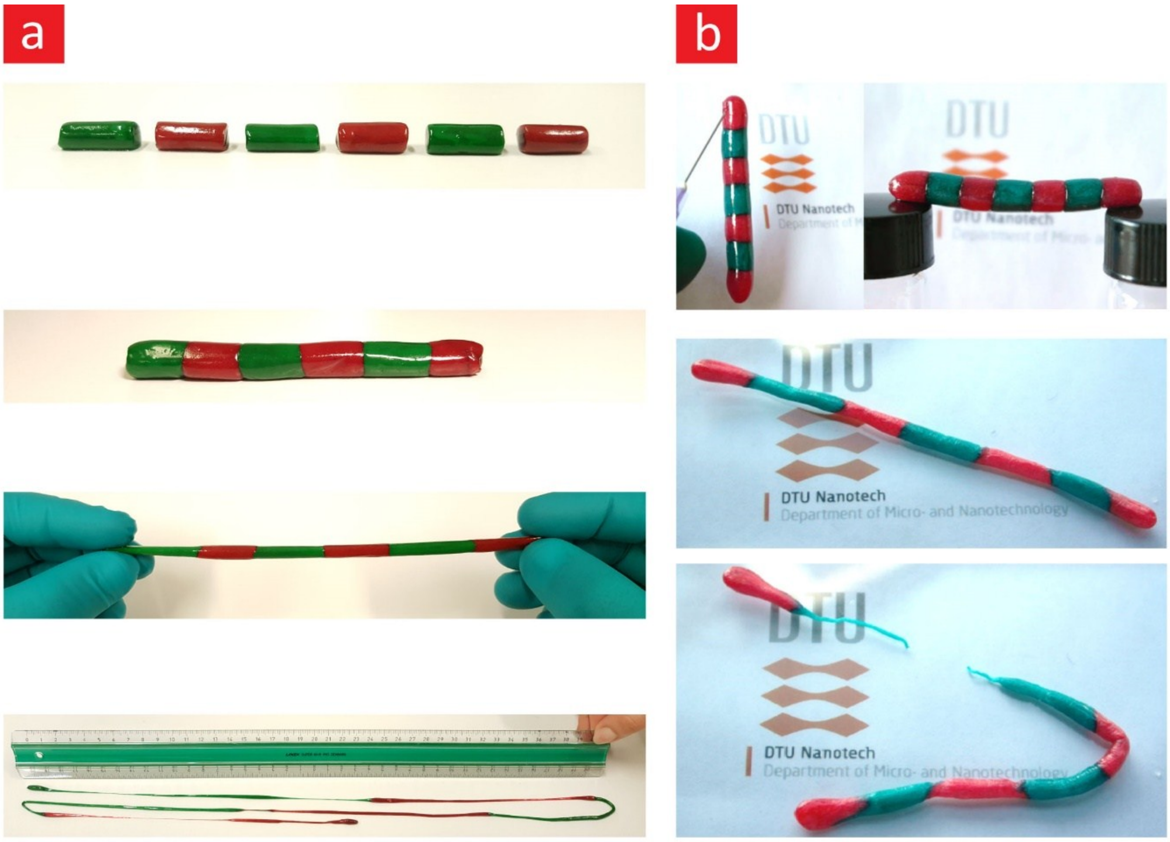

Figure S2. Self-healing and stretchability (a) Self-healing properties and stretchability of PATA. (b) After self-healing, the gel remained at ambient temperature for 5 min before testing the stretchability of the gel, which resulted in its breakage from the internal body of the green area rather than the connected interface.

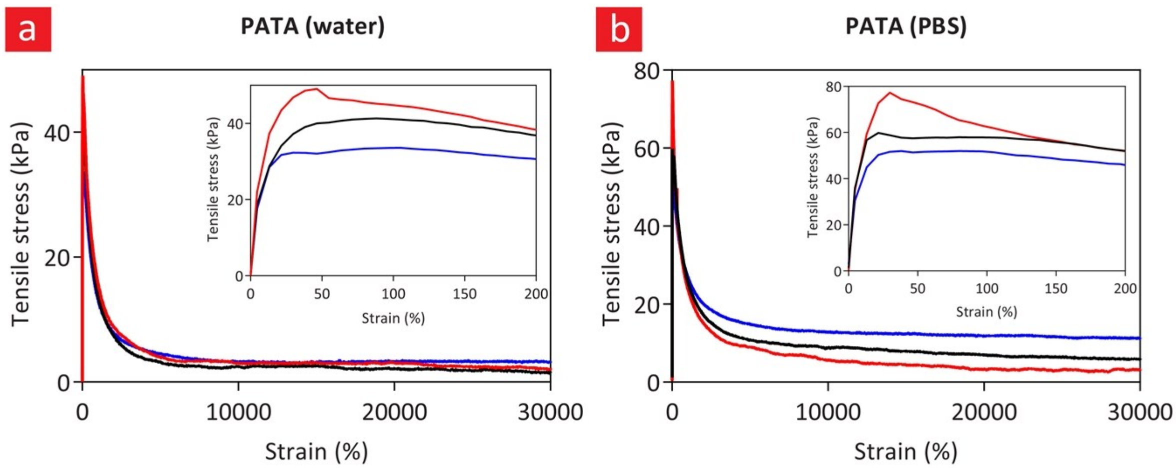

Figure S3. Comparison of stress-strain curves for three replicates of (a) PATA (water) and (b) PATA (PBS). Evidently PATA could stretch up to a value of 30000 % in a consistent manner without sample-to-sample variations.

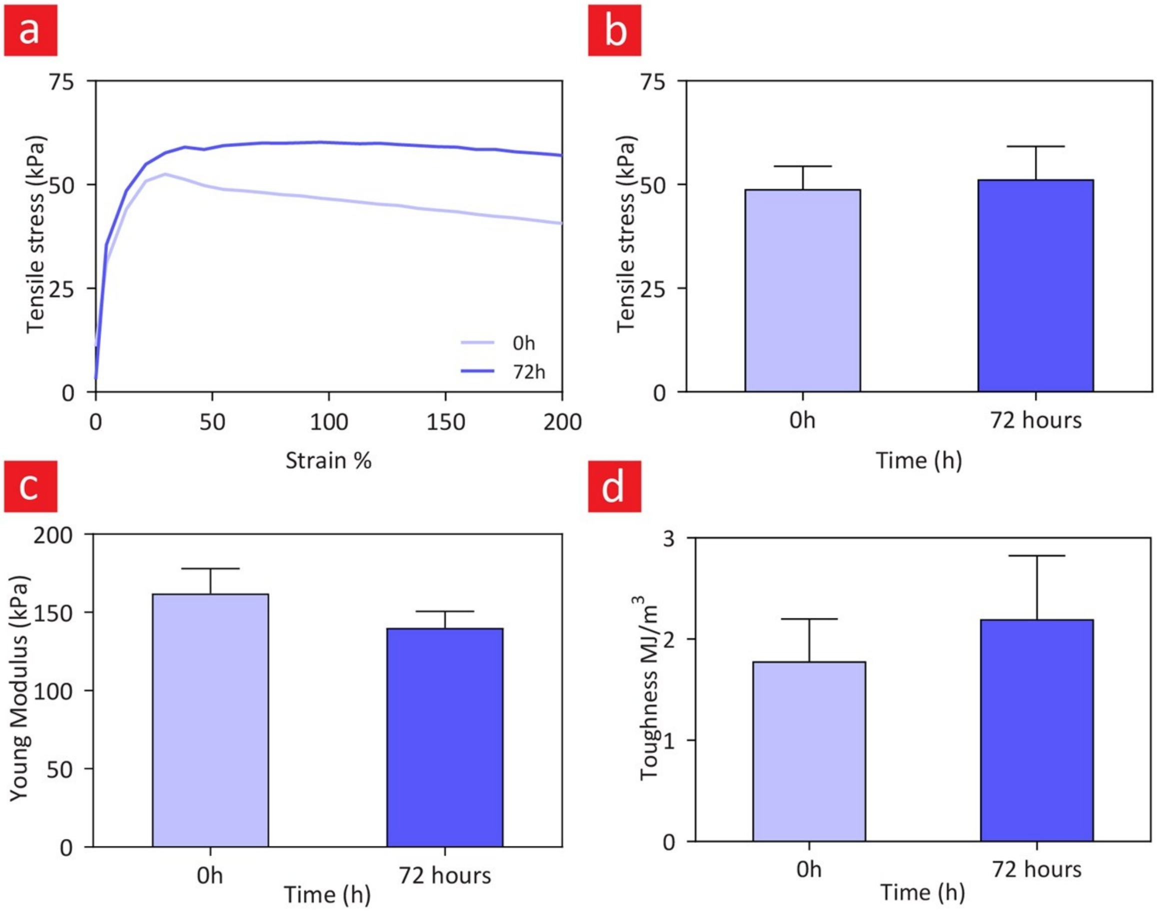

Figure S4. Mechanical properties of PATA after TA release. (a) Stress-strain curves, (b) tensile stress, (c) elastic modulus and (d) toughness corresponding to the mechanical experiments performed after TA from the PATA (PBS, pH 7.4). Experiments were performed by changing the release media every 24 h for 3 consecutive days (72 h).

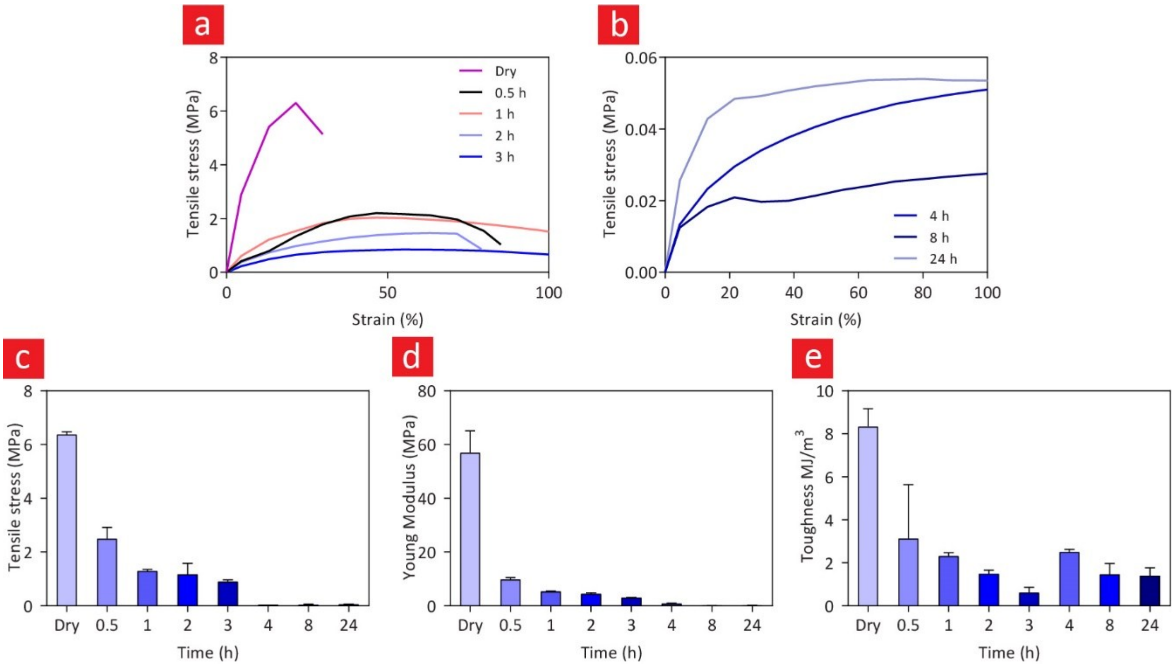

Figure S5. Mechanical properties of PATA after a dehydration-hydration cycle. (a,b) Stress-strain curves, (c) tensile stress, (d) Young Modulus and (e) toughness corresponding to mechanical experiments performed on PATA PBS) after drying the samples and soaking them in water for different time intervals (0.5 h, 1 h, 2 h, 3 h, 4 h, 8 h, 24h).

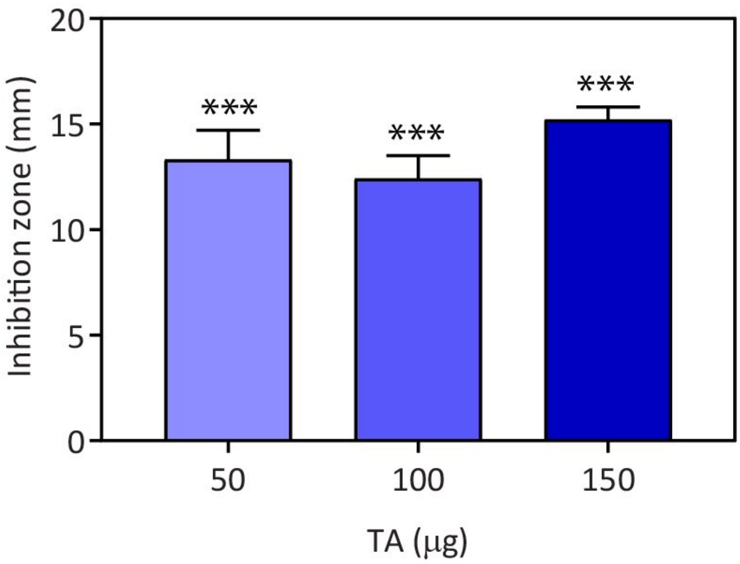

Figure S6. TA and inhibition zones. Quantitative representation of *S. aureus* associated inhibition zones in response to 50, 100, and 150 μg of TA dissolved in 60 μl of the PBS buffer. In brief, TA was added to paper discs, which subsequently were placed on the bacteria contaminated agar plate to enable the TA solution to gradually penetrate through the disk and reach the bacteria.

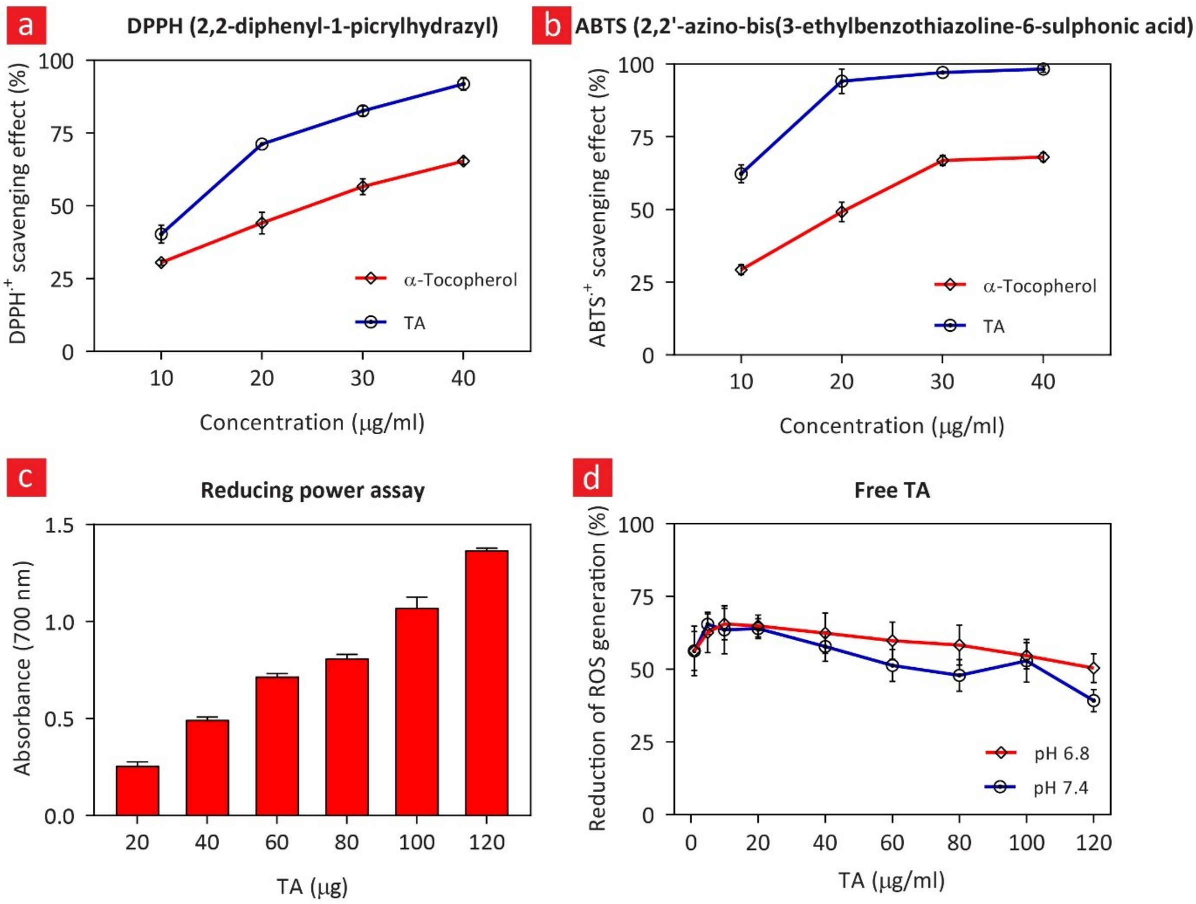

Figure S7. Anti-inflammatory properties of free TA. (a) DPPH scavenging effect, (b) ABTS$^{\cdot+}$ scavenging effect and (f) reducing power of known concentrations of TA. (g) Anti-ROS activity of the known concentrations of TA dissolved in PBS buffer with pH values of 6.8 and 7.4.

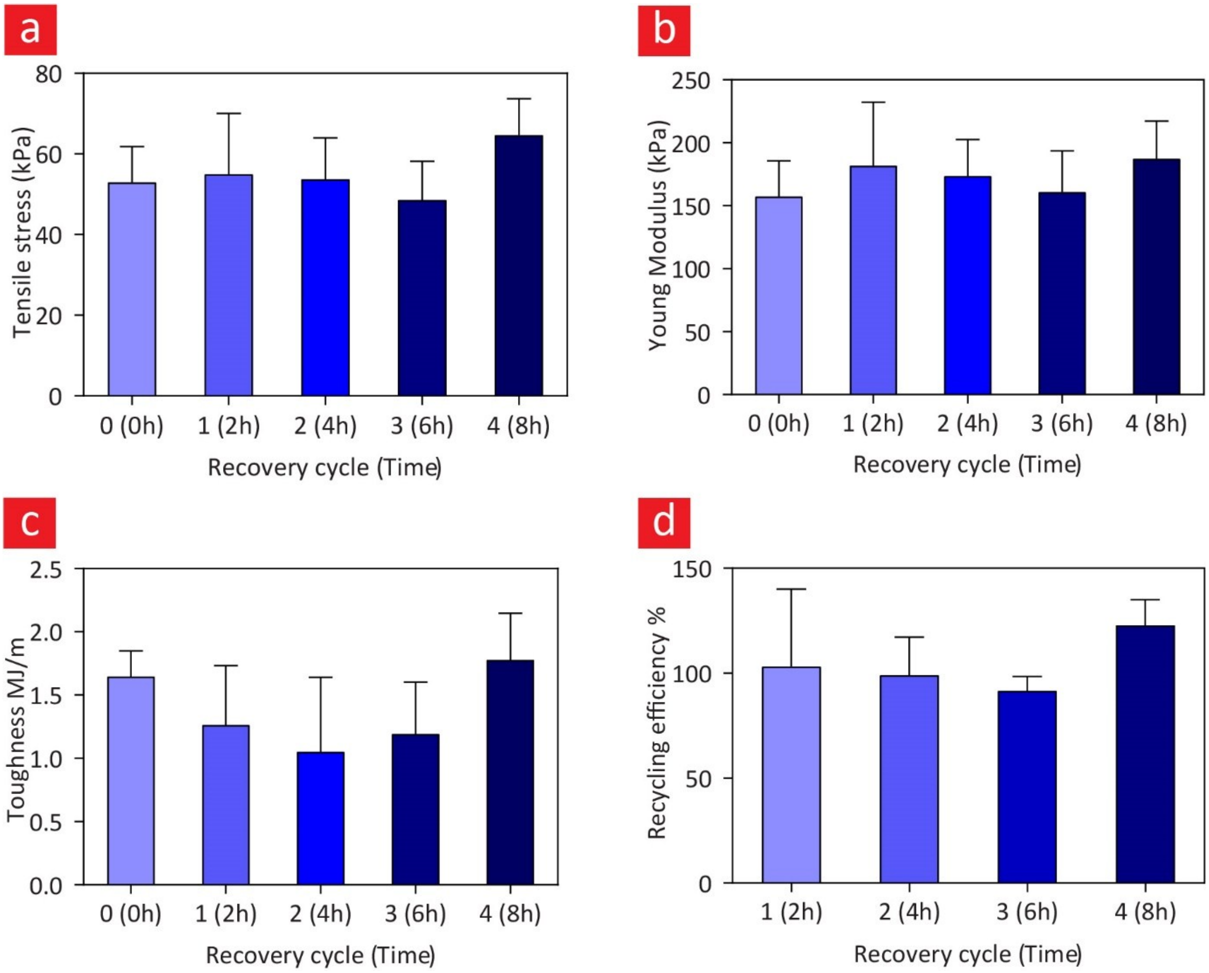

Figure S8. Mechanical properties of PATA after doxepin loading. (a) Tensile stress, (b) elastic modulus (c) Toughness and (d) Recycling efficiency of doxepin loaded PATA (PBS) performed every 2 hours.

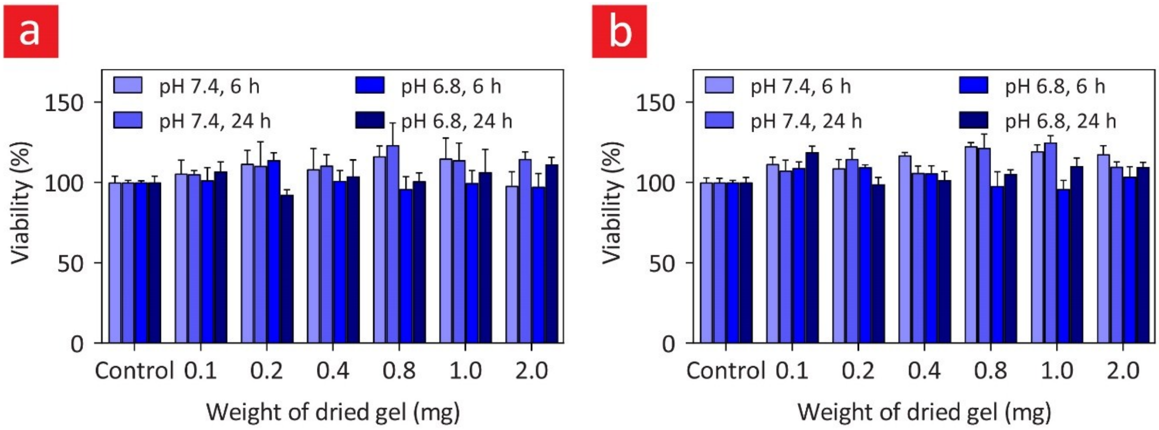

Figure S9. Cell Viability studies. Viability of (a) Caco-2 epithelial cells and (b) CAL 27 epithelial cells cultured at two different pH values for 6 h and 24 h and with various amounts of PATA.