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Nanophotonics based label free detection mechanism for real-time monitoring of interleukin-6†

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Supplementary Information

- Figure13:MPC Hydrogel Flexibility.
- Figure14:Cyclic Voltammetry of unconjugated CoFMPC.
- Figure15:Cell Viability Assay.

Flexibility

We folded MPC-Hydrogel at 180 ◦ to confirm if it can conform with contouring surface when used as dressing. Figure 13 shows its flexible nature.

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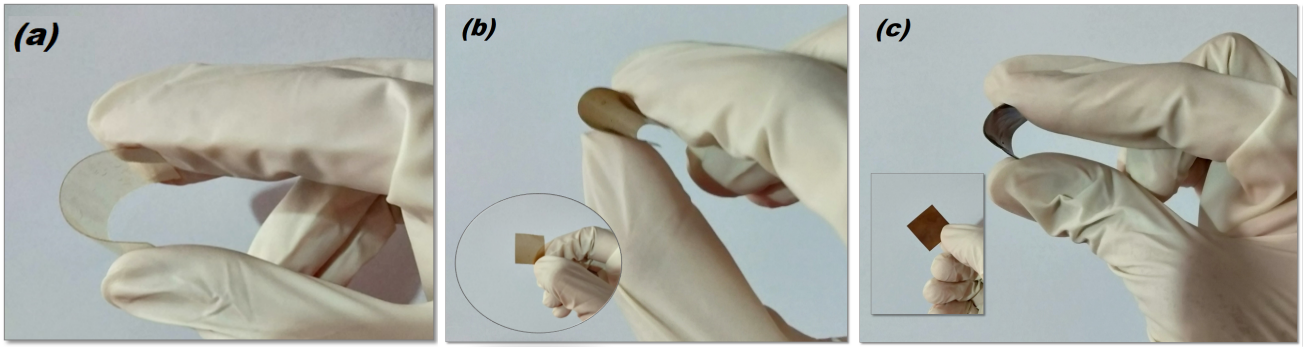

Fig. 13 MPC Hydrogel. Flexibility of synthesized MPC when folded at 180°. (*a*) Hydrogel made of chitosan-gelatin (CG) with 1:5 ratio. (*b*) CG-CoF (0.05% w/v) MPC Hydrogel with embedded IL-6 Sensor is more flexible and easily bendable. (*c*) CG-CoF (0.1% w/v) MPC Hydrogel with embedded IL-6 Sensor offers resistance and has some rigidity when folded.

Cell Viability Assay

We performed cytoxicity assay using PrestoBlue to evaluate if increasing concentration of MNS negatively influence the growth of human dermal cell. Human Dermal Fibroblast cells/HDF were grown and passaged in DMEM media containing 10% FBS and Penicillin antibiotic with a seeding density of 2.4×10^6 cells in a T75 flask. In 96-wells microplate, three different hydrogel samples (0.05%, 0.1% Magnetic and plain Chitosan-Gelatin Hydrogel) of similar size and dimensions were placed and 648 μL of media containing 1.4×10^4 cells were dispensed in each well. The cells were left inside CO_2 (Sanyo CO_2 Incubator) at 37 °C for 24 hours. Next day, we incubated the cells grown over hydrogel after PrestoBlue addition for an hour and measured absorbance at 570 and 600 nm. After measurement, media was changed and cells were kept again on incubation for another 24 hours. Each hydrogel sample was run in duplicate with n=4. The untreated cells exhibited 100% viability and was used as reference for comparison. One-way ANOVA was performed to determine effect of MNS concentration on the HDF growth. Concentration dependent viability test was performed only for CoF based MPC. The treated cells were grown at 0.05% and 0.1 % MPC hydrogel (labeled Magnetic Gel) and following 48 hours, cells grown over 0.1% MPC-Hydrogel showed highest viability percentage, refer to figure 15.

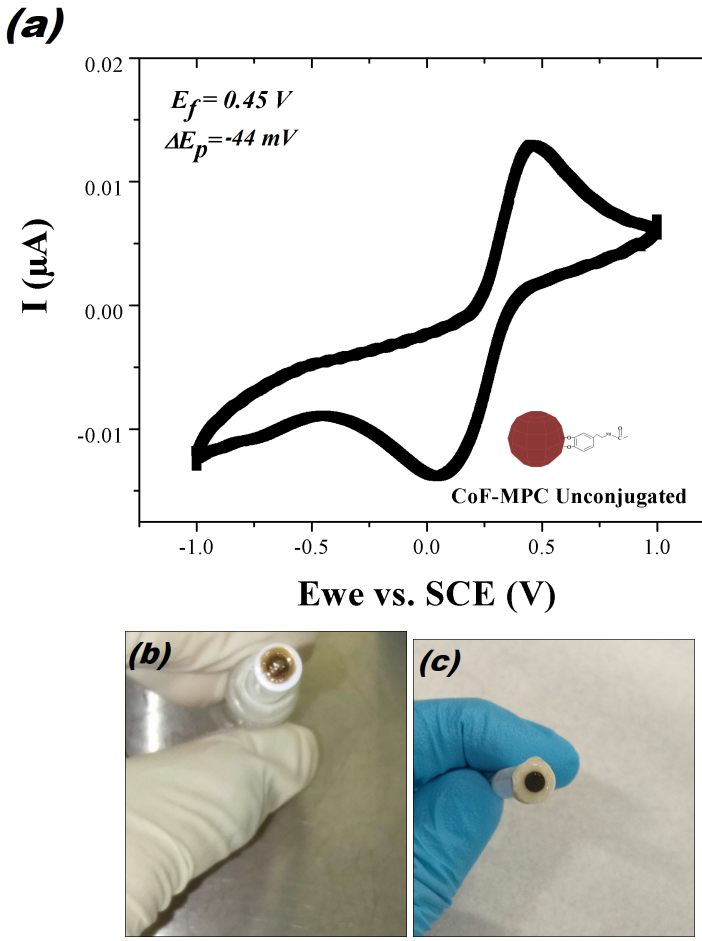

Fig. 14 CV of unconjugated CoF MPC. (a) Cyclic voltammetry of GCE coated with Cobalt Ferrite nanocomposite with chitosan-gelatin hydrogel. It was recorded at E_{range}= -2.5 to +2.5 V; v = 50 mV/s in 0.001M $K_3Fe(CN)_6$ [23]. (b) GCE coated with conjugated Cobalt Ferrite magneto-photonic crystal. (c) CoF-MPC coated electrode following incubation with IL-6 and subsequent CV recording. The MPC-hydrogel did not detach but doubled its size after consecutive readings.

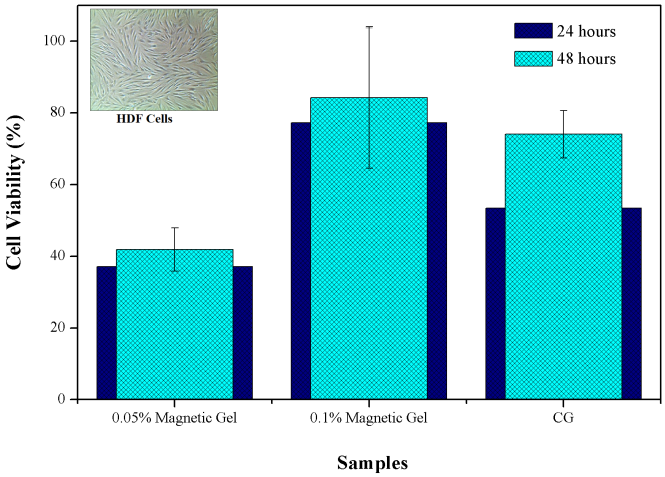

Fig. 15 Cytotoxicity Assay. Human Dermal Fibroblast grown over Chitosan-Gelatin, MPC-Hydrogel 0.05% & 0.1% were tested for cytotoxicity after 24 and 48 hours, using PrestoBlue assay. At α=0.05, the population variations & means are significantly different.