ABSTRACT

Various embodiments may relate to an optical sensor for detecting an analyte. The optical sensor may include a hydrogel film, and one or more cholesteric liquid crystal (CLC) droplets mixed with the hydrogel film. Each of the one or more cholesteric liquid crystal droplets may include a plurality of liquid crystal molecules. The optical sensor may also include modification molecules attached to the one or more cholesteric liquid crystal droplets. The one or more cholesteric liquid crystal droplets may be doped with a photoluminescent dye, may be configured to generate an emission beam in response to a pump laser beam incident onto the one or more cholesteric liquid crystals droplets, and may be configured as whispering gallery mode (WGM) resonators such that a wavelength of the emission beam is shifted in response to the modification molecules coming in contact with a chemical derived from the analyte, thereby detecting the analyte.

FIG. 1