Title:	Liquid crystal based sensing device using a smartphone
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Keywords:	Liquid crystal Optical sensors Fluorescent dyes
Issue Date:	2018
Publisher:	Royal Society of Chemistry
Citation:	Analyst, 143(5), pp. 1046-1052
Abstract:	Liquid crystal (LC) based optical sensors have been found to be very promising for detecting aqueous biological samples due to the ease of optical detection, their cost effectiveness and the removal of the need for labelling biological species with fluorescent dyes. To date, all LC based sensors are studied in laboratories using conventional polarizing optical microscopy (POM), and no attention has been paid towards the fabrication of portable LC sensing devices for use in commercial purposes. Here, we designed and fabricated a 3D printed portable, lightweight, and inexpensive sensing device using a smartphone to detect the optical signal of LC based sensors. The accuracy of the optical signal using the fabricated sensing device is similar to that obtained using conventional POM. The fabricated sensing device, using a smartphone, gives a novel and new platform to LC based sensors for practical applications in the industrial world and people's daily lives.
URI:	https://pubs.rsc.org/en/content/articlelanding/2018/an/c7an01987d#!divAbstract (https://pubs.rsc.org/en/content/articlelanding/2018/an/c7an01987d#!divAbstract) http://hdl.handle.net/123456789/2106 (http://hdl.handle.net/123456789/2106)
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