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Construction of liquid crystal droplet-based sensing platform for sensitive detection of organophosphate pesticide

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Abstract

Alkaline phosphatase (ALP), as an essential disease biomarker, widely distributes in various tissues, and plays a significant role in diagnosis and treatment of some diseases (e.g. cancers and liver dysfunction). Dichlorvos (DDVP), as one of typical organophosphate pesticide, could be hydrolyzed by ALP. In this work, we constructed a simple but robust 4-cyano-4'-pentylbiphenyl (5CB) droplet sensing platform for sensitive and convenient detection of DDVP based on its hydrolysis by ALP. The optical responses of liquid crystals (LCs) originated from controlling orientations of 5CB by using an ALP cleavable surfactant, sodium monododecyl phosphate (SMP). A dark crossed optical image of 5CB was observed due to formation of the SMP

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