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Title:	Development of carbon quantum dot-based lateral flow immunoassay for sensitive detection of aflatoxin M1 in milk
Authors:	Bhardwaj, Sanjeev K. (/jspui/browse?type=author&value=Bhardwaj%2C+Sanjeev+K.)
Keywords:	Development of carbon quantum dot-based lateral immunoassay for sensitive aflatoxin M1 in milk Author links open overlay panel
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Abstract:	Currently, there is a great demand for simple, sensitive, and accurate sensors for aflatoxin M1 (AFM1) in dairy products. In the present research, a novel fluorescent immunosensor based on nitrogen-doped carbon quantum dots (CQDs) has been developed for AFM1 analysis. The N-doped CQDs were synthesized through the hydrothermal approach using citric acid and polyethyleneimine as precursors. The CQDs showed bright blue emission under ultraviolet light irradiation and a maximum emission was observed at 450 nm upon excitation at 350 nm. The anti-AFM1 antibody (Ab) was immobilized on the as-obtained amine-functionalized CQDs and the obtained CQDs/Ab probe was then directly used for developing the immunoassays for AFM1. The fluorescence of the CQDs/Ab solution was effectively quenched in the presence of increasing AFM1 concentrations. Under the optimized conditions, the fluorescent nanosensor exhibited high sensitivity towards AFM1 in the range of 0.2–0.8 ng/mL with low limit of detection i.e., 0.07 ng/mL in standard buffer. Furthermore, the CQDs/Ab immunosensor was developed as a lateral flow design for detecting the aflatoxin residues in milk. This strategy can be used for the development of low-cost, rapid, and highly sensitive sensor strips for the detection of AFM1 in dairy products.
Description:	Only IISER Mohali authors are available in the record.
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