Preparation of QDs Entrapped Polymer Nanofibers as a Scaffold for Enzyme Immobilization

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In this study, we report the structure and shape of PS-PSMA nanofibers with entrapped QDs, which can be prepared by electrospinning the homogenous mixture of polymers and QDs. Uniformly distributed QDs within the polymer matrix of nanofibers induced high degree of compactness and shape rigidity in the nanofibers and allowed efficient enzyme immobilization. The esterase-nanofiber composites were prepared by fabricating crosslinked enzyme aggregates on the surfaces of nanofibers. Esterase coatings on QDs PS-PSMA nanofibers retained good stability by showing no enzyme activity loss under recycled uses for more than ten times. The present study demonstrates a successful application of QDs PS-PSMA nanofibers for enzyme immobilization for the first time; it is anticipated that this technology would be employed in various enzyme applications due to the easy shape control of the nanofibers.