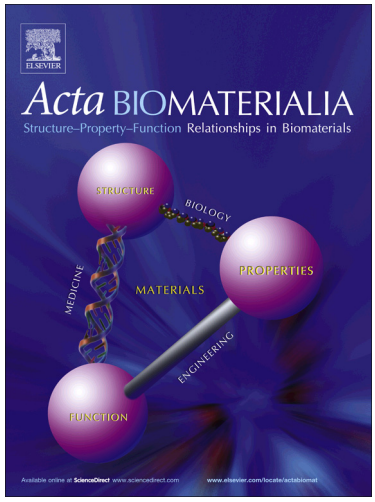

Review article

Biochemistry and biomedicine of quantum dots: from biodetection to bioimaging, drug discovery, diagnosis, and therapy

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Biochemistry and biomedicine of quantum dots: from biodetection to bioimaging, drug discovery, diagnosis, and therapy

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A B S T R A C T

According to recent research, nanotechnology based on quantum dots (QDs) has been widely applied in the field of bioimaging, drug delivery, and drug analysis. Therefore, it has become one of the major forces driving basic and applied research. The application of nanotechnology in bioimaging has been of concern. Through in vitro labeling, it was found that luminescent QDs possess many properties such as narrow emission, broad UV excitation, bright fluorescence, and high photostability. The QDs also show great potential in whole-body imaging. The QDs can be combined with biomolecules, and hence, they can be used for targeted drug delivery and diagnosis. The characteristics of QDs make them useful for application in pharmacy and pharmacology. This review focuses on various applications of QDs, especially in imaging, drug delivery, pharmaceutical analysis, photothermal therapy, biochips, and targeted surgery. Finally, conclusions are made by providing some critical challenges and a perspective of how this field can be expected to develop in the future.