

## Properties and toxicity of extracellularly biosynthesized quantum dots formed by *Escherichia coli*

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### ABSTRACT

Nanobiosynthesis belongs among the most recent methods for nanoparticles synthesis. This type of synthesis bears many advantages such as uniformity in particles shape- and size. Biosynthesis is also considered due its significant advantage regarding the properties of the particles obtained. In this study, we characterized the basic properties and composition of quantum dots (QDs), obtained by the extracellular biosynthesis of *Escherichia coli*. Furthermore, the toxicity of biosynthesized QDs and QDs prepared by microwave synthesis was compared. The obtained results revealed the presence of cyan CdTe QDs after removing substantial amounts of organic compounds, which stabilized the surface of the nanoparticles. QDs toxicity was evaluated using three cell lines (HFF, PC-3 and MCF-7) using the MTT assay. The test revealed toxicity differences between variants of QDs, varying about 10% in the HFF and 30% in the MCF-7 cell lines. Biosynthesized QDs were evaluated to be about 35% less toxic to the PC-3 cell lines than the QDs prepared by microwave synthesis.

**Keywords:** quantum dots, biosynthesis, *Escherichia coli* (*E. coli*), CdTe, toxicity

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