

QUANTUM DOTS AS A PROMISING TOOLS FOR IMMUNOCHEMISTRY

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Quantum dot nanocrystals (QDs), a new class of fluorophores with unique optical properties [1, 2], have been used as a secondary or tertiary antibodies to detect β -tubulin (microtubule network), GM130 (Golgi complex) and EEA1 (endosomal system). The optical characteristics of QDs 655 have been evaluated in terms of emission spectra, photostability and specificity, using Confocal Laser Scanning Microscopy in order to measure these parameters. Data obtained were compared to its homologous Alexa 594 (organic fluorescent molecules). Furthermore, QDs used in this study have also been characterized with High Resolution Transmission Electron Microscopy. QDs are excellent fluorochromes with higher intensity, narrower values of bandwidth and higher photostability than Alexa dyes. The only characteristic that needs to be improved in QDs is their specificity. While QDs showed high specificity against GM130 and EEA1 primary antibodies, poor specificity was demonstrated against β -tubulin. The great potential of QDs as a methodological tool is confirmed. Protocols must be adjusted when using simultaneously QDs and Alexa dyes.

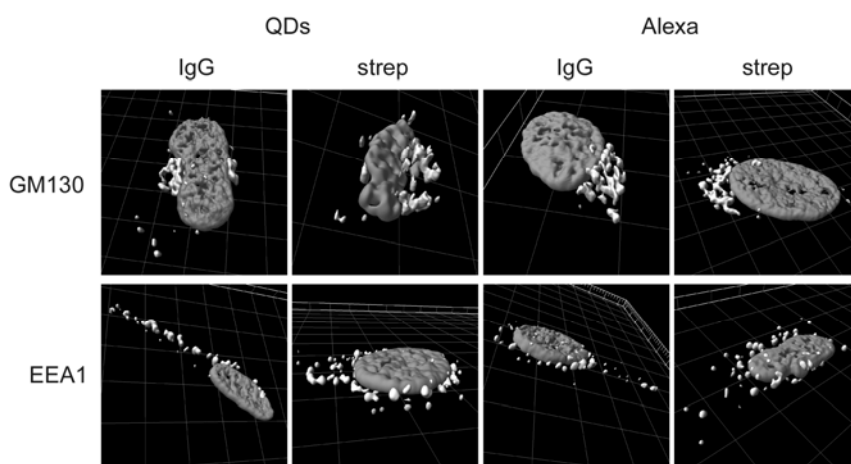


Fig. 1. Isosurface representation of the cell shows the nucleus (dark grey), Golgi complex (GM130) and endosomal system (EEA1) (light grey) within a three-dimensional volumetric x-y-z data field.

[1] A.P. Alivisatos, "Semiconductor Clusters, Nanocrystals, and Quantum Dots". *Science* 271, 933-937 (1996).

[2] U. Resch-Genger. "Quantum dots versus organic dyes as fluorescent labels". *Nature Methods*, 5 (9):763-775 (2008).