

APPLICATION OF FUNCTIONALIZED QUANTUM DOTS IN TARGETED CANCER THERAPY

STEPONKIENE Simona, DAPKUTE Dominyka, ROTOMSKIS Ricardas

*National Cancer Institute, Vilnius University, Vilnius, Lithuania, EU***Abstract**

It has been postulated that most if not all cancers are hierarchically organized and contain a population of cancer stem cells (CSCs) within a tumour that possess the capacity to self-renew. CSCs display extensive differentiation potential and can give rise to new tumours. Eradication of CSCs should cause absence of cells with potentially unlimited division; therefore the tumor should shrink over time. Many studies suggest nanoparticles as a potential new class of material for selective eradication of CSCs. Quantum dots (QDs) have tunable optical properties that have proved useful in a wide range of applications from multiplexed analysis such as DNA detection and cell sorting and tracking, to most recently demonstrating promise for in vivo imaging and diagnostics. The conjugation of QDs with photosensitizers allowed to create a multifunctional platform, which might be suitable not only for imaging of cancer cells but also for the treatment of malignant diseases. However little is known about application of QDs in CSC-directed diagnostics and therapy. The goal of our study was to investigate the accumulation and distribution of functionalized QDs in CSC-like cells. Two different breast cancer cell lines - MCF-7 and MDA-MB-231(described as an experimental model of CSCs) was used for the experiments. The accumulation and distribution of anti-CD44 functionalized QDs as well as QD-photosensitizer chlorin e6 complex was determined in CSC-like cells by the means of Nikon C1si laser scanning confocal microscope equipped with spectral and fluorescence lifetime imaging system.

Keywords: Quantum dots, targeted therapy, cancer stem cells, diagnostics

Author did not supply full text of the paper/poster.