IN VIVO DETECTION OF QUANTUM DOTS IN NUDE MICE.

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Quantum dots (QD) are nanometre size (1–10 nm) semiconductor nanostructured materials with the tuneable size-dependent emission, high photoluminescence (PL) quantum yields, long PL life times (10–50 ns) and narrow symmetric emission bands. Quantum dots are offered as a perspective tools for medical diagnostics. However, there is no unequivocal data on their distribution, localization and accumulation in vivo. It could depend on physical and chemical properties of quantum dots and on the way of introduction to an organism.

GOAL: Studying of distribution and primary localization of quantum dots in vivo after per os administration

OBJECT: CdSeCdSZnS quantum dots were coated with mercaptopropionic acid (MPA QD) emitting at 630 nm, size 10 nm.
Nude mice.

RESULTS AND DISCUSSION

Fluorescence of different tissue and organs was studied postmortem on spectrometer Spectrum-Cluster (excitation wavelength 532 nm).

In the spectra measured after 2 h the traces of MPA QD in digestive system organ were clearly seen, but after night no traces of QD were detected in any probe except for excrements.

In vitro modeling

The optical fluorescent imaging was obtained on UVP iBox (UVP, USA): light source is 150 W halogen lamp; exposition 25 s; excitation filter 502-547 nm; emission filter 570-640 nm.

It was shown under gastric conditions (addition 0,1M HCl) fluorescence intensity of quantum dots MPA decreased. The subsequent addition of NaHCO3 didn’t cause intensity recovery.

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