

IN VIVO DETECTION OF QUANTUM DOTS IN NUDE MICE.



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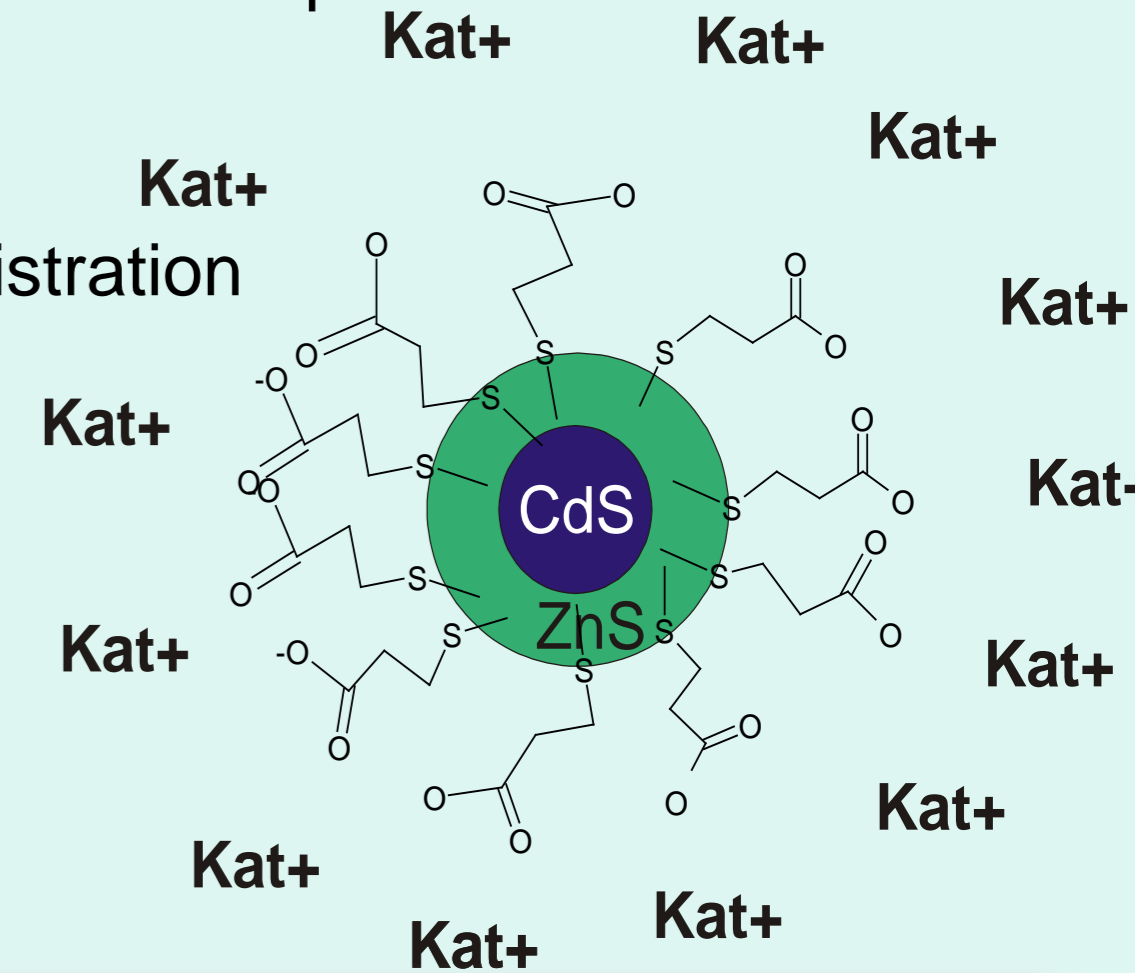
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- Quantum dots (QD) are nanometre size (1–10 nm) semiconductor nanostructured materials with the tuneable size-dependent emission, high photoluminescence (PL) quantum yields, long PL life times (10–50 ns) and narrow symmetric emission bands.
- Quantum 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.

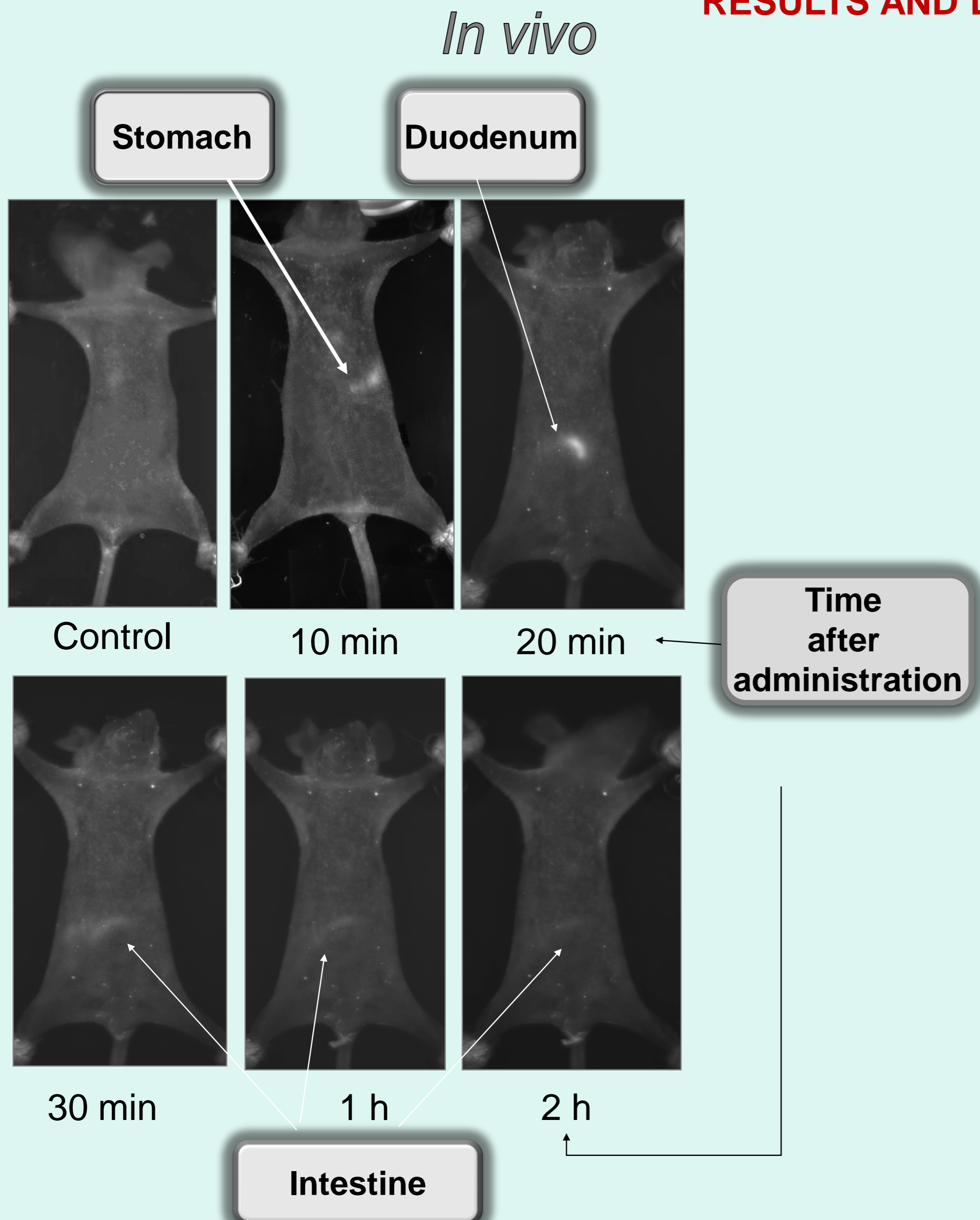
GOAL Studying of distribution and primary localization of quantum dots *in vivo* after *per os* administration

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

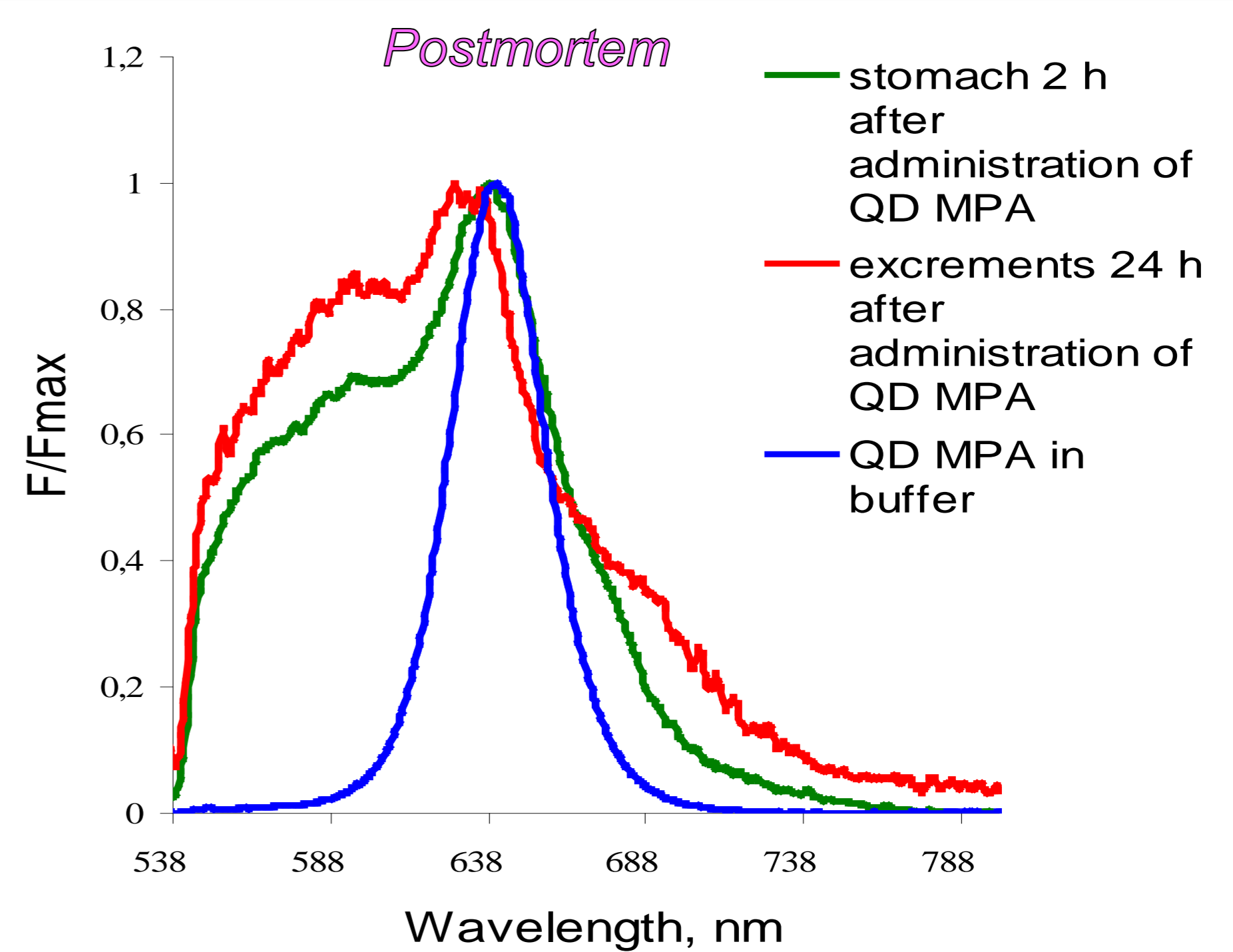


RESULTS AND DISCUSSION

Postmortem



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.

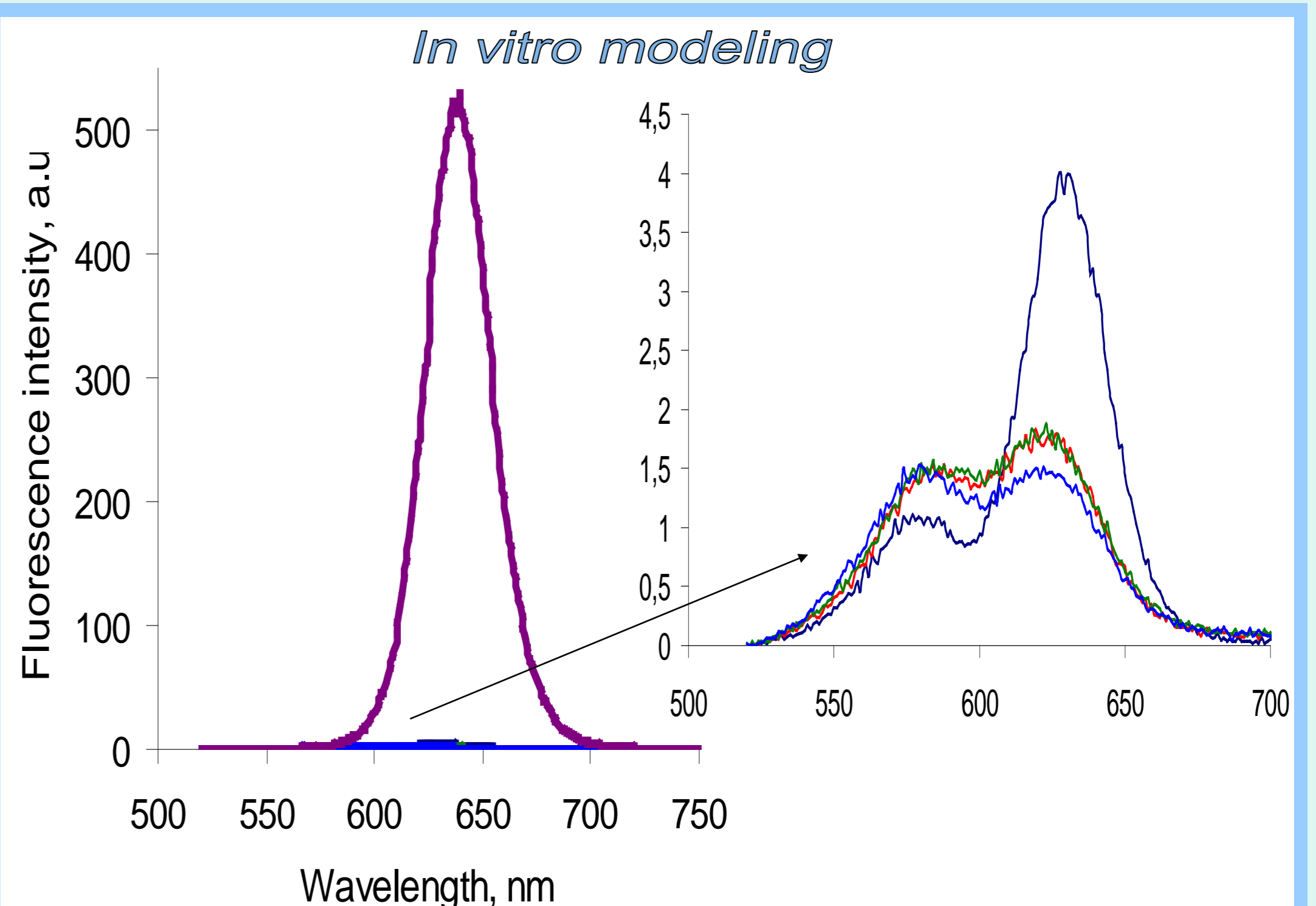
The optical fluorescent imaging was obtained on UVP iBox (UVP, USA): light source is 150 W halogen lamp; exposition 25 s; excitation filter 502-547 nm; emission filter 570-640 nm.

In vitro modeling

Simulation of gastric and intestinal pH conditions

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.

HYPOTHESIS : under the influence of HCL
❖ QD MPA have a tendency to aggregate and lose nanostructure
❖ ZnS – shell of QD have a tendency to degrade



— MPA+HCl_10min — MPA+HCl+NaHCO_20min — MPA+HCl+NaHCO_30min
— MPA+HCl+NaHCO_40min — MPA

CONCLUSION

These preliminary results have shown that after *per os* administration MPA QD didn't accumulate in organism of mice and eliminate with excrements. They influenced by digestive tract conditions and have a tendency to aggregate and dissolve under strong acidic conditions when modeling experiment *in vitro*.

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