Study of optical characteristics changes of the biological tissues after the injection of nanoparticles of various types without and after PDT

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Currently, optical diagnostic and treatment methods are being actively developed, which are distinguished by their speed, minimally invasiveness, and accessibility. Nanocontainers for targeted delivery help in the implementation of such methods. In such cases, porous $CaCo_3$ particles are used as carriers, which have a weak cytotoxic effect on living cells. For example, nanocontainers with dyes are used in photodynamic therapy (PDT) to slow down the growth of tumor tissue. However, it is important to know the optical properties of tissues in the zone of photodynamic exposure, since this makes it possible to evaluate the effect of nanocontainers on the optical properties of tissues in the irradiation zone, which must be taken into account when calculating the loading of the active agent into the carrier.

One of the promising materials for the development of phototherapy methods is functionalized upconversion nanoparticles (UCNPs), which can not only increase the efficiency of PDT, but also provide an additional photothermal effect with simultaneous temperature control of the therapy area.

This study shows the change in optical parameters, such as absorption coefficient, scattering coefficient, anisotropy coefficient, of biological tissues before and after the introduction of nanoparticles of various types. The measurements were carried out *ex vivo* at room and physiological temperatures, which makes it possible to bring the obtained data closer to the real conditions of photodynamic therapy.

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