

Exogenous and endogenous contrast agents for optical imaging in near-infrared and beyond 1000 nm

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Optical imaging and diagnostics rely on optical contrast agents and their excited states. The ability to probe, investigate, and control these states through molecular design is one of the largest achievements of modern science. We will discuss the design of cyanine fluorescent probes for deep tissue imaging absorbing and emitting in the near-infrared spectral range (700-1000 nm) where the biological tissue is relatively transparent. We will illustrate the applicability of the probes in several biomedical applications for monitoring inflammation processes in preclinical settings. In addition, we will present a new optical window that spans from 1000 to 1600 nm. We will discuss the applicability of this spectral range for even deeper tissue imaging and the search for the contrast agents optically active in this window of opportunity. We will also present contrast-free imaging as well the challenges in the imagers design.

Prof. Berezin focuses on fundamental properties of fluorescent probes and contrast agents and their applications in medicine. He is a faculty member of two programs at Washington University: Division of Biology & Biomedical Sciences and Institute of Materials Science & Engineering. His work is documented in more than 50 peer-review papers, several book chapters, and patents in this field. Addressing the importance of high-quality optical measurements, he founded Optical Spectroscopy Core Facility with top-of-the-line commercial and developed in house instrumentation to serve scientists around the globe.

Papers:

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