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Biocompatible photoacoustic nanoparticular contrast agents based on BODIPY-scaffold and polylactide polymers

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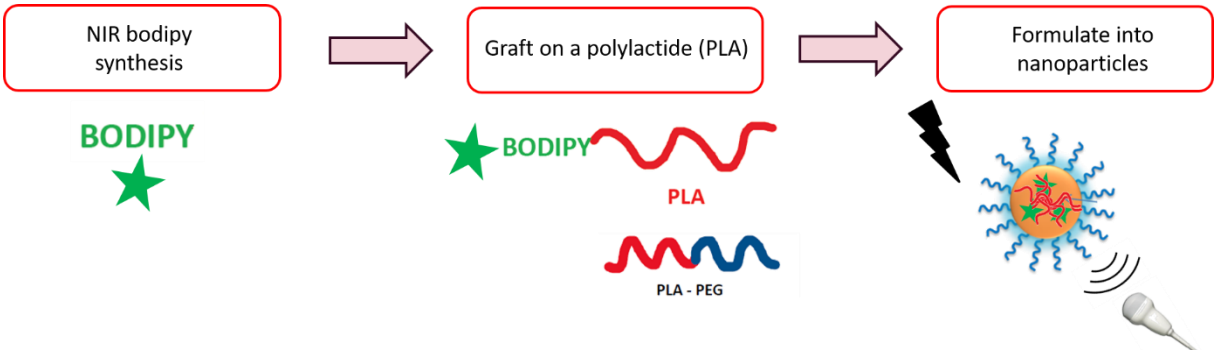
Photoacoustic imaging is an emerging biomedical imaging modality combining optical and ultrasound waves to map optical-absorption contrast at centimetric depth with sub-millimeter resolution. The key is the photoacoustic (PA) effect: optically absorbing structures emit ultrasound waves when excited with a ns-laser pulse. To reach cm-depth, PA imaging operates in the near-infrared (NIR) window in biological tissue (650-1000nm). NIR optical absorbers can thus be mapped throughout the range of depths and resolution explorable with medical ultrasound. We have designed novel PA molecules based on the BODIPY scaffold. These PA-BODIPYs were used as initiators for the ring opening polymerization of lactide to yield BODIPY-polylactide, that were further formulated into nanoparticles (NP). We present here the full spectroscopic and photoacoustic characterizations of the PA-BODIPYs, the corresponding polymers and NPs. Results show BODIPY NPs are promising contrast agents for PA imaging.



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