

DESCRIPTION FOR THE GENERAL PUBLIC

The complex biological roles played by peroxynitrite in cellular signaling pathways and various diseases have not yet been fully elucidated. One of the main reasons for this lies in the lack of effective chemical tools for unambiguous monitoring of **ONOO⁻** formation *in vivo*.

The main goal of this grant proposal is to design and synthesize novel, stable, well characterized probes, which can be used in biological and biomedical studies for the *in vivo* biophotonic or fluorescent imaging of peroxynitrite. Team efforts will be directed on the design and optimization of the synthesis of novel boronate-based fluorogenic, luminogenic, and mitochondrial-targeted fluorogenic probes. The next aim of this project is the development and validation of the methodology for the detection of oxidant-specific products by combination of the bioluminescent/fluorescent imaging in cells and *in vivo* with the HPLC or LC-MS-based analyses of the oxidant-specific product(s) – footprint(s) (Fig. 1). The combination of spectroscopic imaging of peroxynitrite with rigorous chromatographic characterization of specific products is highly innovative and will enable unambiguous detection of **ONOO⁻** in the *in vivo* settings.

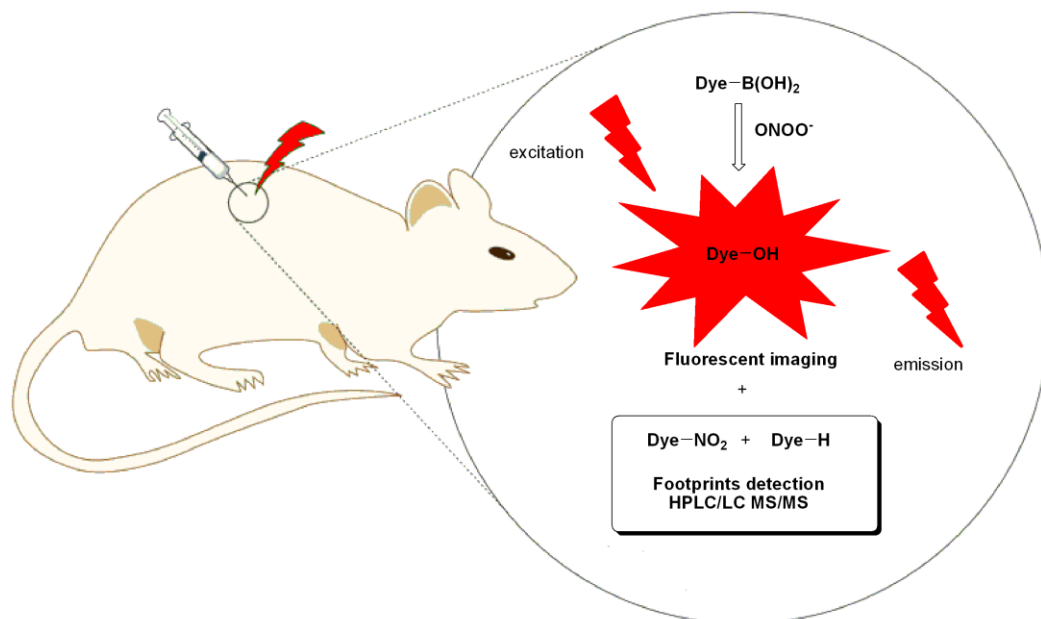


Fig. 1 A scheme showing the application of probe for *in vivo* fluorescent imaging of **ONOO⁻** in combination with HPLC and/or LC-MS/MS footprints detection.