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A NIR excitable fluorescent probe for a versatile intracellular nitric oxide detection

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Understanding intracellular dynamics and concentrations of diverse intracellular analytes is key to develope novel diagnostic tools. **Fluorescence-based molecular probes** have proben to be key for intracellular imaging and sensing analytes of biological interest. Most of the currently available fluorescent probes are excited using ultraviolet or visible light, which results in high photodamage to living cells. Alternatively, **near-infrared (NIR) light** provides high photostability, low autofluorescence, high biological tissue penetration and minimal photodamage. In the development of diagnostic tools for cancer, one of the most relevant reactive nitrogen species is **nitric oxide (NO)** since its effect is strongly related to its concentration. Fluorescent NIR excitable molecular probes seem to be ideal candidates for the intracellular detection of NO and could ultimately yield to valuable insights on the biological role played by NO.
The aim of this work is to develop a **NIR excitable molecular probe for the intracellular detection of NO** via a photoinduced electron transfer (PET) mechanism. The probe showed good sensitivity (LOD = 78 nM) and selectivity towards NO. Additionally, the fluorescence intensity of the probe was stable in a range of pHs from 4 to 9; and the detection of NO in acidic environments was succesfully evidenced. The NO probe was able to detect NO in a variety of macrophages including RAW264.7 cells, by means of confocal microscopy and multiphoton microscopy (NIR excitation). The NO probe is currently being used to detect intracellular NO in other cellular environments including endothelial cells.

References:
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