NIR FLUORESCENT HYPOXIA SENSORS

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One of the characteristic features of many solid tumors is that their fast growth leads to deficient intratumoral vascularization, which results in low oxygen availability. This oxygen deprived condition triggers a defensive response inside the cells, called hypoxic response.[1]

Nowadays, fluorescent probes have become indispensable tools for bioimaging applications. In this case, hypoxia-sensitive fluorescent probes can be used to monitor the hypoxic status of tumor cells via the detection of reductase (i.e. azoreductase, nitroreductase, CYP450 reductase).[2]

Near-Infrared (NIR) fluorescence imaging penetrates deeper in tissues, has higher resolution and lower tissue fluorescence than the visible in vivo imaging.[3]

Azo compounds can be employed as fluorescence inhibitors when are located close to fluorophores due to the photoisomerization process of the N=N double bond. This feature in combination with the ability to recover fluorescence in a reducing medium due to the cleavage of the N=N bond, make azo compounds excellent candidates in bio-imaging **Figure 1**.[4]

In this work we present a hypoxia-sensitive probe that consists of a system containing the pyrylium salt unit as chromophore and an azo unit as a fluorescence inhibitor. These organic compounds present remarkable fluorescent properties, and excellent chemical and photophysical stabilities.

The synthesis of these compounds generates interest for the in vivo detection of hypoxia, thanks to their application as fluorescent probes in bio-imaging techniques.[5]

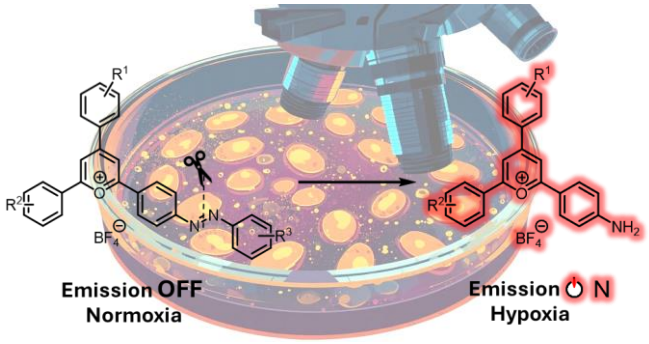

Figure 1. Hypoxia azo sensors

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