S32-5 Photocontrollable Nitric Oxide and HNO Donors

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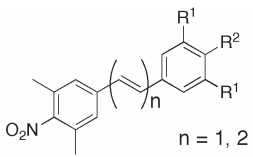
Nitric oxide (NO) has proven in recent years to be involved in the maintenance of vital functions such as regulation of blood pressure, neuromodulation, and biodefense. The potential pharmacological activity of HNO (nitroxyl) in relation to nitric oxide (NO) has recently received much attention. HNO is reported to induce a variety of effects such as positive inotropy, vasodilation, and cardioprotection through mechanisms different from those of NO. In view of these benefits, NO and HNO donors, especially controllable ones, are expected to be potentially useful as therapeutic agents and also as experimental pharmacological agents. We have developed photoinduced NO donors (**1**) based on photoisomerization of nitrobenzene. It was demonstrated that those NO donors showed cytotoxic activity for a cultured cancer cell line depending photoirradiation and NO release. We then upgraded them to a two-photon NO donor (**2**) by introducing a two-photon absorbing moiety, which can work at 700-800 nm by two-photon mechanism. In light of photoinduced reaction of our previous NO donors, we also developed first photocontrollable HNO donors (**3**) employing retro hetero-Diels Alder reaction.



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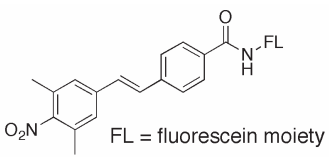

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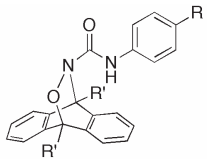

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