

A Photochemical Amplifier Based on Self-Immolative Dendritic Spacers

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Part I: A molecular amplifier could be defined as a device capable of transforming a weak chemical (physical) input into a large chemical (physical) output. In this work, we will present a molecular amplifier capable of releasing multiple chemical entities upon activation by a single photochemical event. Our system could be used as 1) indicator 2) solubilizing agent and 3) as controlled drug delivery system, and is based on readily available building blocks, such as 1) a photolabile protecting group (2-nitrobenzyl, (oNB)), 2) a self immolative linker (phenol derivative) and 3) *para*-nitrophenol, a colored releasable group. The prepared dendrimer indeed released up to 27 leaving groups upon photolysis at 360 nm.

Part II: In this work we intended to move from two level already in our group to three-level chromatic orthogonality by exploiting the two-photon excitation capacity of *ortho*-hydroxycinnamic ester and its derivatives in presence of others (e.g *ortho*-nitrobenzyl and benzoin photolabile protecting groups) in order to possibly expand the wavelength ranges available to visible/NIR. Initial studies showed that significant interference between the different photolabile protecting groups prevented a real orthogonality but, evidences that the goal is still achievable were observed.

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