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EDITORIAL

Photoremovable protecting groups: development and applications

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The 2008 Nobel Prize in Chemistry was awarded to Osamu Shimomura, Martin Chalfie and Roger Y. Tsien "for the discovery and development of the green fluorescent protein, GFP", a key tool to study chemical processes in living cells. Photoremovable protecting groups (PPGs) are equally important, artificial and very versatile tools allowing for the designed release of various chemicals such as bioagents (neurotransmitters, cell signaling molecules), acids, bases, Ca^{2+} ions, NO, oxidants, insecticides and pheromones, fragrances, *etc*. Multiphoton excitation can provide additional spatial resolution (superresolution) and temporal control to address living tissues.

The present themed issue covers a wide range of areas, as is characteristic for the application of PPGs. It includes three perspectives (on the controlled release of bioactive volatiles, on photoactivatable fluorophores and techniques for biological imaging applications, and on applications of *p*-hydroxyphenacyl and coumarin-4-ylmethyl PPGs) as well as 16 original research papers covering such diverse topics as:

• the development of novel PPGs permitting, for example, the release of near-IR emitting dyes for fluorescence microscopy, the removal of a chiral auxiliary, the release of fragrances, the conversion of non-ionic into ionic surfactants for use in 2-D gel electrophoresis, or fluorescent PPGs for alcohols and carboxylic acids;

• the development of PPGs with novel properties such as a cell-permeant caged inositol triphosphate (IP3) or donor–acceptor chromophores with highly efficient two-photon cross sections;

• the light control of riboswitch activity;

• the effect of the leaving groups on the release efficiency;

• the photoamplified detection of avidin binding events;

• the photoinduced release of a drug for the treatment of ocular herpes simplex virus;

• photolithographic DNA chip technology, where it is found that diffusional sensitization can be more effective than intramolecular sensitization.

I am grateful and pleased that so many renowned researchers have positively responded to a call for contributions to this issue and I trust that many scientists will find stimulating articles for their own work to push ahead this rapidly developing field.

Jakob Wirz