

One- and Two-Photon Responsive Photoremovable Protecting Groups: Regulated Release of Anticancer Drugs and Persulfides

Our main focus is to develop one- and two-photon responsive photoremovable protecting groups (PRPGs) for spatio-temporal release of biological entities, mainly anticancer drugs and persulfides.

The thesis entitled “*One- and Two-Photon Responsive Photoremovable Protecting Groups: Regulated Release of Anticancer Drugs and Persulfides*” consists of five chapters. **Chapter 1** describes the design, photophysical, photorelease mechanism, and biological applications (hydrogen sulfide release and drug delivery) of PRPGs. **Chapter 2A** and **2B** deal with the spatio-temporal release of biologically active *N*-acetyl *L*-cysteine persulfide and *in situ* generation of Cu(II)-complex (anticancer agent) using *o*-nitrobenzyl PRPGs, respectively. **Chapter 3** describes the development of single component fluorescent organic nanoconjugates of squaraine-coumarinyl PRPG for synergistic cancer treatment. **Chapter 4** illustrates the real-time monitored photorelease of hydrogen persulfide (H_2S_2) by *p*-hydroxyphenacyl PRPG, and **Chapter 5** deals with the development of new visible light activated fluorescent PRPG based on bimane chromophore for the simultaneous release of two same and different carboxylic acids, amino acids, and anticancer drugs.

