



Non-Confidential Technology Disclosure

Title: Rapid photocontrol of fluorescence

Investigator: Stephen Miller, Ph.D., Department of Biochemistry and Molecular Pharmacology, University of Massachusetts Medical School

Description: This invention describes novel photoactivated oxazines, an exemplary class of near-IR fluorophores. Photoactivation (PA) of fluorescence is a powerful technique for the study of biological molecules in living cells. Dr. Stephen Miller has created novel photoactivated oxazines which allow the use of long-wave UV light to rapidly turn on the fluorescence of a near-IR dye with spatial and temporal precision. Commonly used small molecule fluorophores have structural limitations and step-wise photoactivation processes which are circumvented by Dr. Miller's approach as this technology requires a single photocleavable group. Additionally, Dr. Miller has synthesized a novel amine-reactive photocaged oxazine dye, NVOC-AB1 attached to a tetracysteine tag to make SplAsH-NVOC-AB1 which can be specifically targeted to proteins bearing tetracysteine peptide tags.

Application: This invention may be utilized for:

- Dye kits for labeling proteins, nucleotides, and other biomolecules with dyes whose fluorescence can be turned off, turned on, or switched to a different wavelength.
- Imaging proteins and other biopolymers well beyond the diffraction limit.
- Optical data storage and image recording.

Advantage: This is the first example of a near-IR fluorophore that can be targeted to tetracysteine tags as well as the first example of a photoactivatable near-IR fluorophore targeted to proteins by any means. This invention improves upon current commercially available products by allowing the photoactivation of fluorescence with bright, photostable near-IR dyes, using constructs that are much smaller and less prone to photobleaching than those currently available such as PA-GFP. Furthermore, this method allows the study of dynamic cellular processes by providing a means to make fiducial marks on biopolymers, monitor biomolecule diffusion and differentiate between two or more populations of a biomolecule.

Patent Status: Patent pending

Licensing Status: Available to license

Docket: UMMC 07-42

Contact: Lisa L. Decker, Ph.D.
Associate Director
Phone: (508)-856-5055, Fax: (508)-856-1482
Lisa.Decker@umassmed.edu