

From Photobiolumination to Optogenery, Recent Advances in NIR Light Photo medicine Applications

Marc Folcher

Department of Biosystems Science and Engineering, ETH Zurich, Switzerland

Abstract

The biophysical physical associated with the Near Infrared light (NIR) have fostered the development of many therapeutic applications with high clinical relevance. On the one hand the unique NIR penetration properties enable the clinical monitoring of tissue hemodynamic state; on the other hand, NIR light allows a unique spatiotemporal control over a drug delivery scenario. Furthermore, the optogenetic bioengineering toolbox has now widened the spectrum of possible applications to NIR fluorescing proteins proteins for cell monitoring but also to NIR synetic optogenetic pathway programming. This review gives an overview of the recent proof of concepts that may broaden the field of NIR light photomedicine applicatiob. NIR deep-brain photobiomodulation may hold the promise to offer new options for the treatment of neurodegenetic disorders. Light-activated nanometer-sized drugs and light control vesicles delivering photothermal therapy effectors could circumvent deleterious side effects associated with systemic drugs. Optogenery profits from the NIR light optogenetic interface to have a controlled delivery of therapeutic proteins by a bioelectronic implant and opens the road of the tomorrow photomedicine.

Received: May 15, 2022; **Accepted:** May 19, 2022; **Published:** May 24, 2022

Biography

Mark Folcher Department of Biosystems Science and Engineering, ETH Zurich, Switzerland