
INT Symposium on “Advanced Photonic Imaging in Neuroscience”

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Hideaki Mizuno is an associate professor at KU Leuven since 2011 and leading the laboratory of Biomolecular Network Dynamics. His group is working on development of fluorescent proteins and their applications to imaging in living cells as well as in vivo. He is also interested in understanding photochemical properties of fluorescent proteins.

S2-L4 ‘Fluorescent proteins for functional imaging and super-resolution microscopy.’

In the last two decades, fluorescent proteins became indispensable tools for noninvasive labeling of intracellular molecules. Cloning from various sea organisms as well as mutagenesis has expanded color pallet of fluorescent proteins, which makes multi-color imaging possible. By making use of the color variants as donor and acceptor of Förster resonance energy transfer (FRET), we can design genetically encoded functional probes. These probes are applicable for imaging in intact animals by employing genetic engineering methods such as establishment of transgenic animals. In addition to the color variants, we have found unique fluorescent proteins that show a photoswitching property. These finding expanded the applications of fluorescent proteins to track molecules and highlight cells on a microscope. Furthermore, based on photoswitchable fluorescent proteins, a new microscopic modality circumventing the diffraction limit of light was invented. I will introduce our recent achievements in developing fluorescent protein, functional imaging and biological applications of super-resolution imaging.
