

学 術 講 演 会

日時：2009年5月28日（木） 13:00－14:30

場所：理学部6号館5F 571号室

講師：Prof. Peter Maroti, University of Szeged, HUNGARY

講演タイトル：" **Double agent light: architect and indicator of photosynthetic apparatus of bacteria**"

要旨： It is well recognized how light is used to create the photosynthetic machinery of bacteria but much less is known how the emitted light can be used to monitor the photosynthetic apparatus. In this lecture, the focus is placed on luminescence (prompt and delayed fluorescence) of whole cells as source of information of *in vivo* state and function of photosynthesis. Although the importance of fluorescence of bacteriochlorophyll from photosynthetic bacteria has been recognized since decades, it has not become a routine tool in photosynthesis research in sharp contrast to chlorophyll fluorescence in oxygenic phototrophs. By kinetic measurements of prompt and delayed fluorescence from bacteriochlorophyll in purple nonsulphur bacteria *Rhodobacter sphaeroides* on wide (from 10 μ s to 1 s) time range, we will show its widespread use in investigation of function and structural organization of the photosynthetic apparatus including the energetics, energy transfer, electron transport and proton uptake of the primary processes. Several examples will demonstrate that native luminescence combined with kinetic absorption change spectrometry characterizes light-induced redox changes and their reverse (waste) processes in different levels of organizations (isolated reaction center protein, membrane fragments and intact whole cells) of the bacteria. By synchronization of the growth of bacteria, some luminescence-detected phenomena can be revealed which might be specific to age, to level of organization of the intracytoplasmic membrane (ICM) or to cell cycle of the bacteria. As all of these characteristics are sensitive to assembly of photosynthetic units and to environmental effects, luminescence can be used to (bio)monitor these processes and even forecast harmful consequences.

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