

**FOM2010 TUTORIAL WORKSHOP
“LIVE CELL IMAGING”**

Jurek W.Dobrucki

**Division of Cell Biophysics, Faculty of Biochemistry, Biophysics and Biotechnology,
Jagiellonian University, Kraków, Poland
e-mail: jerzy.dobrucki@uj.edu.pl**

Optical microscopy has witnessed an unprecedented growth and development in the last three decades. Sophisticated microscopy studies of structure and function of living cells are becoming almost routine now. However, the use of new microscopy techniques for studies of living cells is associated with new challenges. Cells, which are labeled with fluorescent dyes and fluorescent proteins are easily damaged, when exposed to exciting light. Cell physiology may be influenced considerably by interaction of light with fluorescent probes and tags.

I will introduce methods, which are used in the realm of live cell imaging, in order to optimize experimental conditions and avoid disturbance and damage to cells under study. I will discuss how to: 1. minimize photobleaching and phototoxicity caused by low molecular weight dyes and fluorescent proteins, 2. stabilize pH in live cell imaging, in a small sample on a microscope stage, 3. avoid evaporation and hypertonic shock, 4. minimize thermal drift of the sample vs. the objective, 5. minimize spherical aberration, 6. gain depth in confocal imaging, 7. use photodamage constructively for studies of cellular repair processes.