

Microscopy methods in biomedicine 14 – 18 October 2013

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-9:00	Registration of participants	x	x	x	x
9.00 - 9.45	Physical optics in transmitted light microscopy <i>Prof. Plášek</i>	Microscopy observation of processes in living systems, overview of techniques: FRAP, FLAP, FLIP, BRET, FLIM, PRIM, FRET, FCS, LCS cytometry <i>Prof. Hozák</i>	Image formation in transmission electron microscope, tomography and EELS <i>Dr. Benada</i>	Image Sensing and Digitization <i>Doc. Hozman</i>	Tutorials (3 groups): ... continuation from Thursday afternoon 3rd set 9.00-10.45
10.00 - 10.45	Components of a microscope, image formation, optical aberrations, types of objectives <i>Prof. Plášek</i>	Super-resolution light microscopy <i>Prof. Hozák</i>	Image generation in scanning electron microscope <i>Dr. Benada</i>	Correlative microscopies (light, electron/FIB/...) <i>Ing. Nebesářová</i>	
10.45 - 11:00	coffee break	coffee break	coffee break	coffee break	coffee break
11.00 - 11.45	Contrast formation in transmitted light, mathematical methods for improving image quality, deconvolution <i>Prof. Plášek</i>	FRET a FRAP in detail <i>Dr. Staněk</i>	Sample preparation for electron microscopy – chemical methods <i>Ing. Nebesářová</i>	Stereological methods: sampling, volume, number, surface area, and length measurements <i>Dr. Kubínová</i>	Measurement of 3D image data using image analysis and stereological methods <i>Dr. Kubínová and Dr. Janáček</i>
12.00 - 12.45	Fluorescence microscopy and immunolabelling <i>Prof. Hozák</i>	Atomic force microscopy in biology (AFM) <i>Dr. Janda</i>	Sample preparation for electron microscopy – physical methods <i>Ing. Nebesářová</i>	Company presentations – Zeiss, MTM, Nikon	Image segmentation <i>Dr. Čapek</i>
12.45 - 14.00	lunch	MTM lunch workshop	lunch	lunch	lunch
14.00 - 14.45	Multidimensional laser confocal microscopy - principles and applications <i>Prof. Hozák</i>	Tutorials (5 groups) 1) atomic force microscope (AFM) 2) confocal microscope – observation of GFP-tagged protein in living cells	Tutorials (5 groups) 1) TEM demonstration 2) HPF, FS and ultramicrotomy 3) EM immunolabelling – detection of clustering and colocalization	Tutorials (3 groups): 14.00-17.15 1) image processing 2) stereological methods 3) methods for evaluation of CLSM data <i>Dr. Janáček</i>	Image analysis and 3D visualization
14.45 - ca 17.00	Tutorials (5 groups) 1) microscope adjustments and Köhler illumination 2) phase contrast 3) interference contrast 4) selection of immunolabelling 5) working with living cells 6) fluorescence microscope <i>Prof. Hozák/Leica (2)/ Zeiss (1,3)/ Dr. J. Rohožková (4)/ Mgr. A. Filimoněnko (5)</i>	...continues 3) FRAP – microscopy observation 4) FRAP – determination of diffusion constant 5) TIRF microscopy <i>Prof. Hozák/Dr. J. Rohožková (1) Dr. Petrášek (2)/ RNDr. J. Fukalová (2)/ Mgr. E. Simkova (3,4)/Mgr. S. Yildirim(4)/ Dr. Horváth (5)</i>	...continues 4) image acquisition and digitizing in TEM 5) SEM demonstration <i>Prof. Hozák/Ing. Nebesářová (1)/Dr. M. Sobol (2)/Mgr. A. Filimoněnko (3)/ Dr. O. Benada (4,5)</i>	1st set: 14.00-15.45 2nd set: sled 15.45 - 17.15 <i>Dr. Kubínová/Mgr. Čerňavský/ Dr. Lhotáková/Mgr. Z. Kubínová/ Dr. Radochová/Dr. Janáček/ Dr. Karen/Dr. Gerla</i>	Preparing digital images for publications <i>Dr. Benada</i>
					COURSE EVALUATION 15.30 – 15.45 Prof. Hozák