Program

Nano2Life Summer School

Methods in Micro – Nanotechnology and Nanobiotechnology

30 June – 10 July 2008

MONDAY , 30 JUNE – NCSR "DEMOKRITOS"	
09:00-09:30	***Welcome***
09:30-10:15	Lecture 1.1: Cell biology principles - Part 1 (Dr Dimitris Mastellos)
10:15-11:00	Lecture 1.2: Structure of biological macromolecules (Prof. Elias Eliopoulos)
11:00-11:15	***Coffee Break***
11:15-12:00	Lecture 1.2: Structure of biological macromolecules (Prof. Elias Eliopoulos)
12:00-13:00	Lecture 1.1: Cell biology principles - Part 2 (Dr Dimitris Mastellos)
13:00-14:00	***Lunch break***
14:00-15:30	Lecture 1.3: Microelectronic Materials and Device Technology (Dr Spyros Gardelis)
15:30-15:45	***Coffee Break***
15:45-17:15	Lecture 3.2: Lab on chip devices: Principles, applications, opportunities (**Invited**: Dr Joel Rossier)
17:15-18:00	Lecture 2.3.7: Applied Bioinformatics in BioNanoTechnology (Dr Georgios Spyrou)

TUESDAY , 1 JULY – NCSR "DEMOKRITOS"	
09:00-10:30	Lecture 2.3.1: Gel-based protein analysis methods (Dr Antonia Vlahou)
10:30-11:15	Lecture 2.3.2: Non-gel based protein analysis methods (Dr Spiros D. Garbis)
11:15-11:30	***Coffee Break***
11:30-12:15	Lecture 2.3.3: Binding Assays and Immunosensors Part 1 - Binding assays (Dr Sotirios Kakabakos)
12:15-13:00	Lecture 2.3.3: Binding Assays and Immunosensors Part 2 - Immunosensors (Dr Christos Mastichiadis)
13:00-13:45	Lecture 2.3.4: DNA and Protein arrays: fabrication, detection and applications (Dr Panagiota Petrou)
13:45-14:45	***Lunch break***
14:45-15:30	Lecture 2.3.6: Introduction into Bioinformatics (Dr Sophia Kossida)
15:30-17:00	Lecture 1.4: Introduction to nanobiotechnology (**Invited**: Prof. Yossi Shacham-Diamand)
17:00-17:15	***Coffee Break***
17:15-18:45	Lecture 2.2.7: Imaging with Scanning Probes (AFM, STM, SNOM) (**Invited**: Dr Martin Bennink)

WEDNESDAY , 2 JULY – ACADEMY OF ATHENS

09:00-09:45	Lecture 2.2.8: Fluoresence imaging and 3D image visualization using confocal microscopy (Dr Stamatis Pagakis)
09:45-10:00	***Coffee Break***
10:00-12:00 **(shift 1)**	Laboratory 2.2.4: State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) Laboratory 2.3.1: Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) Laboratory 2.3.2: Mass spectrometry (Dr Spiros D. Garbis) Laboratory 2.3.3: Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) Laboratory 2.3.6: Bioinformatics laboratory (Dr Sophia Kossida)
12:00-12:15	***Coffee Break***
12:15-14:15 **(shift 2)**	Laboratory 2.2.4: State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) Laboratory 2.3.1: Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) Laboratory 2.3.2: Mass spectrometry (Dr Spiros D. Garbis) Laboratory 2.3.3: Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) Laboratory 2.3.6: Bioinformatics laboratory (Dr Sophia Kossida)
14:15-15:15	***Lunch break***
15:15-17:15 **(shift 3)**	Laboratory 2.2.4: State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) Laboratory 2.3.1: Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) Laboratory 2.3.2: Mass spectrometry (Dr Spiros D. Garbis) Laboratory 2.3.3: Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) Laboratory 2.3.6: Bioinformatics laboratory (Dr Sophia Kossida)
17:15-17:30	***Coffee Break***
17:30-19:30 **(shift 4)**	Laboratory 2.2.4: State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) Laboratory 2.3.1: Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) Laboratory 2.3.2: Mass spectrometry (Dr Spiros D. Garbis) Laboratory 2.3.3: Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) Laboratory 2.3.6: Bioinformatics laboratory (Dr Sophia Kossida)

THURSDAY , 3 JULY – NCSR "DEMOKRITOS"

09:00-10:30	Lecture 2.1.1: Conventional patterning schemes for hard substrates for bioanalytic microdevices (Dr Evangelos Gogolides)
10:30-11:15	Lecture 2.1.2: Microfabrication technologies for plastic analytical microfluidics Part 1 - (Dr Angeliki Tserepi)
11:15-11:30	***Coffee Break***
11:30-12:15	Lecture 2.1.2: Microfabrication technologies for plastic analytical microfluidics Part 2 - (Dr Angeliki Tserepi)
12:15-13:45	Lecture 2.1.3: Patterning of biomolecules and other biological substances (Dr Panagiotis Argitis)
13:45-14:45	***Lunch break***

14:45-16:15	Lecture 2.1.4: Molecular bioelectronics (Dr Eleni Makarona)
16:15-16:30	***Coffee Break***
16:30-18:00	Lecture 3.1: Principles of Integrated Biosensing Devices (Dr Konst. Misiakos)

FRIDAY , 4 JULY – NCSR "DEMOKRITOS"

09:00-10:30	Lecture 3.3: Acoustic wave sensors: from device fabrication to biological applications (**Invited**: Dr Elektra Gizeli)
10:30-10:45	***Coffee Break***
10:45-14:15 **(shift 1)**	Laboratory 2.1.1: Fabrication of microfluidic devices on plastic substrates by Soft lithography (Dr Angeliki Tserepi) Laboratory 2.1.2: Fabrication of plastic microfluidic devices by Lithography and deep polymer plasma etching techniques (Dr Evangelos Gogolides) Laboratory 2.1.3: Electrical characterization of tunnelling devices based on organic molecules or biomolecules (Dr Eleni Makarona, Dr Dimitris Velessiotis) Laboratory 2.3.4+2.3.5: Fabrication of protein microarrays using lithography (Dr Antonis Douvas) Fluorescence detection of protein arrays (Dr Panagiota Petrou) Laboratory 3.1: Operation of a lab-on-a-chip optical device using model assays and real time measurements (Dr Konstantinos Misiakos)

MONDAY , 7 JULY – NCSR "DEMOKRITOS"

09:00-11:30 **(shift 2)**	Laboratory 2.1.1: Fabrication of microfluidic devices on plastic substrates by lithographic techniques (Dr Angeliki Tserepi) Laboratory 2.1.2: Fabrication of plastic microfluidic devices by Lithography and deep polymer plasma etching techniques (Dr Evangelos Gogolides) Laboratory 2.1.3: Electrical characterization of tunnelling devices based on organic molecules or biomolecules (Dr Eleni Makarona, Dr Dimitris Velessiotis) Laboratory 2.3.4+2.3.5: Fabrication of protein microarrays using lithography (Dr Antonis Douvas) Fluorescence detection of protein arrays (Dr Panagiota Petrou) Laboratory 3.1: Operation of a lab-on-a-chip optical device using model assays and real time measurements (Dr Konstantinos Misiakos)
11:30-12:00	***Coffee break***
12:00-14:30 **(shift 3)**	Laboratory 2.1.1: Fabrication of microfluidic devices on plastic substrates by lithographic techniques (Dr Angeliki Tserepi) Laboratory 2.1.2: Fabrication of plastic microfluidic devices by Lithography and deep polymer plasma etching techniques (Dr Evangelos Gogolides) Laboratory 2.1.3: Electrical characterization of tunnelling devices based on organic molecules or biomolecules (Dr Eleni Makarona, Dr Dimitris Velessiotis) Laboratory 2.3.4+2.3.5: Fabrication of protein microarrays using lithography (Dr Antonis Douvas) Fluorescence detection of protein arrays (Dr Panagiota Petrou) Laboratory 3.1: Operation of a lab-on-a-chip optical device using model assays and real time measurements (Dr Konstantinos Misiakos)

14:30-15:30	***Lunch break***
15:30-18:00 **(shift 4)**	Laboratory 2.1.1: Fabrication of microfluidic devices on plastic substrates by lithographic techniques (Dr Angeliki Tserepi) Laboratory 2.1.2: Fabrication of plastic microfluidic devices by Lithography and deep polymer plasma etching techniques (Dr Evangelos Gogolides) Laboratory 2.1.3: Electrical characterization of tunnelling devices based on organic molecules or biomolecules (Dr Eleni Makarona, Dr Dimitris Velessiotis) Laboratory 2.3.4+2.3.5: Fabrication of protein microarrays using lithography (Dr Antonis Douvas) Fluorescence detection of protein arrays (Dr Panagiota Petrou) Laboratory 3.1: Operation of a lab-on-a-chip optical device using model assays and real time measurements (Dr Konstantinos Misiakos)

TUESDAY , 8 JULY – NCSR "DEMOKRITOS"

09:00-09:45	Lecture 2.2.1: Targeting RNA with small molecules: a Pharmaceutical Industry Study (Dr Dionysios Vourloumis)
09:45-11:00	Lecture 2.2.2 and 2.2.3: Drug Delivery and Targeting Systems - Focus on Liposomes (**Invited**: Prof. Sophia Antimisiaris)
11:00-11:15	***Coffee Break***
11:15-12:00	Lecture 2.2.5: Magnetic nanoparticles for bioapplications (Dr Ioannis Rabias)
12:00-12:45	Lecture 2.2.6: Principles of Biomimetics in Core Nanotechnologies (Prof. Georgia C. Papaefthymiou)
12:45-13:45	***Lunch break***
13:45-14:30	Lecture 2.2.4: Controlled positioning of biomolecules using lasers (**Invited**: Dr Maria Farsari)
14:30-15:15	Lecture 2.3.5: Metabolomics in the Post-Genomic Era (**Invited**: Dr Maria I. Klapa)
15:15-16:30	Lecture 2.2.2 and 2.2.3: Drug Release and Delivery Systems - Methods (Dr Irene Mavridis, Dr Konstantina Yannakopoulou)
16:30 **20:00**	*Excursion to Cape Sounion* ***Dinner***

WEDNESDAY , 9 JULY – NCSR "DEMOKRITOS"

10:15-13:45 **(shift 1)**	Laboratory 2.2.1: Drug inclusion in cyclodextrins: monitoring in situ by NMR spectroscopy, X-ray diffraction characterisation of drug inclusion and 3-D visualisation (Dr K. Yannakopoulou, Dr E. Saridakis, Dr A. Paulidou) Laboratory 2.2.2+2.2.3: • Liposomes: preparation and characterisation by dynamic light scattering and ζ-potential • Video enhanced optical microscopy and Atomic Force Microscopy of Liposomes (Dr Dimitrios Tsiourvas, Dr Zili Sideratou) Laboratory 2.2.5+2.2.6: Magnetic nanomaterials for bioapplications Magnetic hyperthermia for Biomedical applications (Dr Ioannis Rabias) Determining Magnetic Anisotropy at the Nanoscale Case study: Horse Spleen Ferritin STEM, Mössbauer and SQUID measurements (Prof. Georgia C. Papaefthymiou) Laboratory 3.2: Demonstration of a capillary fluoroimmunosensor (Dr Sotirios Kakabakos)

13:45-14:45	***Lunch break***
14:45-18:00 **(shift 2)**	Laboratory 2.2.1: Drug inclusion in cyclodextrins: monitoring in situ by NMR spectroscopy, X-ray diffraction characterisation of drug inclusion and 3-D visualisation (Dr K. Yannakopoulou, Dr E. Saridakis, Dr A. Paulidou) Laboratory 2.2.2+2.2.3: • Liposomes: preparation and characterisation by dynamic light scattering and ζ-potential • Video enhanced optical microscopy and Atomic Force Microscopy of Liposomes (Dr Dimitrios Tsiourvas) Laboratory 2.2.5+2.2.6: Magnetic nanomaterials for bioapplications Magnetic hyperthermia for Biomedical applications (Dr Ioannis Rabias) Determining Magnetic Anisotropy at the Nanoscale Case study: Horse Spleen Ferritin STEM, Mössbauer and SQUID measurements (Prof. Georgia C. Papaefthymiou) Laboratory 3.2: Demonstration of a capillary fluoroimmunosensor (Dr Sotirios Kakabakos)

THURSDAY , 10 JULY – NCSR "DEMOKRITOS"

09:00-12:30 **(shift 3)**	Laboratory 2.2.1: Drug inclusion in cyclodextrins: monitoring in situ by NMR spectroscopy, X-ray diffraction characterisation of drug inclusion and 3-D visualisation (Dr K. Yannakopoulou, Dr E. Saridakis, Dr A. Paulidou) Laboratory 2.2.2+2.2.3: • Liposomes: preparation and characterisation by dynamic light scattering and ζ-potential • Video enhanced optical microscopy and Atomic Force Microscopy of Liposomes (Dr Dimitrios Tsiourvas) Laboratory 2.2.5+2.2.6: Magnetic nanomaterials for bioapplications Magnetic hyperthermia for Biomedical applications (Dr Ioannis Rabias) Determining Magnetic Anisotropy at the Nanoscale Case study: Horse Spleen Ferritin STEM, Mössbauer and SQUID measurements (Prof. Georgia C. Papaefthymiou) Laboratory 3.2: Demonstration of a capillary fluoroimmunosensor (Dr Sotirios Kakabakos)
12:30-13:00	***Closing ceremony***
13:00-14:00	***Lunch***