

**Nano2Life Summer School**  
**Micro – Nanotechnology and Nanobiotechnology**  
 26 June-7 July  
**Programme**

<b>MONDAY, 26 JUNE – NCSR “DEMOKRITOS”</b>	
9:00-9:30	<i>Welcome</i>
9:30-10:15	<u>Lecture 1.1</u> : Cell biology principles-Part 1 (Dr Dimitris Mastellos)
10:15-11:00	<u>Lecture 1.2</u> : Structure of biological macromolecules (Professor Elias Eliopoulos)
11:00-11:15	<i>Coffee Break</i>
11:15-12:00	<u>Lecture 1.2</u> : Structure of biological macromolecules (Professor Elias Eliopoulos)
12:00-12:45	<u>Lecture 1.1</u> : Cell biology principles-Part 2 (Dr Dimitris Mastellos)
12:45-14:00	<i>Lunch break</i>
14:00-15:30	<u>Lecture 1.3</u> : Microelectronic Materials and Device Technology (Dr Spyros Gardelis)
15:30-15:45	<i>Coffee Break</i>
15:45-17:15	<u>Lecture 1.4</u> : Introduction to nanobiotechnology (Professor Yoshi Shacham-Diamand)
<b>TUESDAY, 27 JUNE– NCSR “DEMOKRITOS”</b>	
9:00-10:30	<u>Lecture 2.3.1</u> : Gel-based protein analysis methods (Dr Antonia Vlahou )
10:30-10:45	<i>Coffee Break</i>
10:45-12:15	<u>Lecture 2.3.2</u> : Non-gel based protein analysis methods (Dr Spiros D. Garbis)
12:15-12:30	<i>Coffee Break</i>
12:30-13:15	<u>Lecture 2.3.3</u> : Binding Assays and Immunosensors Part A: Binding assays (Dr Sotirios Kakabakos)
13:15-14:15	<i>Lunch break</i>
14:15-15:00	<u>Lecture 2.3.3</u> : Binding Assays and Immunosensors Part B: Immunosensors (Dr Christos Mastichiadis)
15:00-15:15	<i>Coffee Break</i>
15:15-16:45	<u>Lecture 2.3.4</u> : DNA and Protein arrays: fabrication, detection and applications. (Dr Panayota Petrou)
16:45-17:00	<i>Coffee Break</i>
17:00-17:45	<u>Lecture 2.3.6</u> : Introduction into Bioinformatics (Dr Sophia Kossida)
<b>WEDNESDAY, 28 JUNE – ACADEMY OF ATHENS</b>	
9:00-9:45	<u>Lecture 2.2.8</u> : Fluorescence imaging and 3D image visualization using confocal microscopy (Dr Stamatis Pagakis)
9:45-10:00	<i>Coffee Break</i>
10:00-12:00 (shift 1)	<u>Laboratory 2.2.4</u> : State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) <u>Laboratory 2.3.1</u> : Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) <u>Laboratory 2.3.2</u> : Mass spectrometry (Dr Spiros D. Garbis) <u>Laboratory 2.3.3</u> : Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) <u>Laboratory 2.3.6</u> : Bioinformatics laboratory (Dr Sophia Kossida)

<b>12:00-12:30</b>	<i>Coffee Break</i>
<b>12:30-14:30 (shift 2)</b>	<u>Laboratory 2.2.4</u> : State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) <u>Laboratory 2.3.1</u> : Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) <u>Laboratory 2.3.2</u> : Mass spectrometry (Dr Spiros D. Garbis) <u>Laboratory 2.3.3</u> : Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) <u>Laboratory 2.3.6</u> : Bioinformatics laboratory (Dr Sophia Kossida)
<b>14:30-15:30</b>	<i>Lunch break</i>
<b>15:30-17:30 (shift 3)</b>	<u>Laboratory 2.2.4</u> : State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) <u>Laboratory 2.3.1</u> : Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) <u>Laboratory 2.3.2</u> : Mass spectrometry (Dr Spiros D. Garbis) <u>Laboratory 2.3.3</u> : Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) <u>Laboratory 2.3.6</u> : Bioinformatics laboratory (Dr Sophia Kossida)
<b>17:30-17:45</b>	<i>Coffee Break</i>
<b>17:45-19:45 (shift 4)</b>	<u>Laboratory 2.2.4</u> : State of the art confocal microscopy of biological samples (Dr Stamatis Pagakis) <u>Laboratory 2.3.1</u> : Protein separation by two-dimensional electrophoresis (Dr Antonia Vlahou) <u>Laboratory 2.3.2</u> : Mass spectrometry (Dr Spiros D. Garbis) <u>Laboratory 2.3.3</u> : Fabrication of protein microarrays using nanoplotter (Dr George Tsangaris) <u>Laboratory 2.3.6</u> : Bioinformatics laboratory (Dr Sophia Kossida)
<b>THURSDAY, 29 JUNE– NCSR “DEMOKRITOS”</b>	
<b>9:30-10:20</b>	<u>Lecture 2.1.1</u> : Conventional patterning schemes for hard substrates for bioanalytical microdevices (Dr Evangelos Gogolides)
<b>10:20-10:30</b>	<i>Coffee Break</i>
<b>10:30-11:50</b>	<u>Lecture 2.1.2</u> : Patterning technologies for plastic substrates: fabrication of (bio) analytical microdevices (Dr Angeliki Tserepi)
<b>11:50-12:00</b>	<i>Coffee Break</i>
<b>12:00-13:30</b>	<u>Lecture 2.1.3</u> : Patterning of biomolecules and other biological substances (Dr Panagiotis Argitis)
<b>13:30-14:30</b>	<i>Lunch break</i>
<b>14:30-15:50</b>	<u>Lecture 2.1.4</u> : Molecular bioelectronics (Dr Nikos Glezos)
<b>15:50-16:00</b>	<i>Coffee Break</i>
<b>16:00-17:30</b>	<u>Lecture 3.1</u> : Principles of Integrated Biosensing Devices (Dr Konstantinos Misiakos)
<b>FRIDAY, 29 JUNE – NCSR “DEMOKRITOS”</b>	
<b>9:00-12:30 (shift 1)</b>	<u>Laboratory 2.1.1</u> : Fabrication of microfluidic devices on plastic substrates by lithographic techniques (Dr Angeliki Tserepi) <u>Laboratory 2.1.2</u> : Fabrication of plastic microfluidic Devices by Lithography and deep polymer plasma etching techniques. (Dr Evangelos Gogolides) <u>Laboratory 2.1.3</u> : Electrical characterization of tunneling devices based on organic molecules or biomolecules (Dr Nikos Glezos): <u>Laboratory 2.3.4+2.3.5</u> : Fabrication of protein microarrays using lithography (Dr Margarita Chatzichristidi) Fluorescence detection of protein arrays (Dr Panagiota Petrou).

	<u>Laboratory 3.1</u> : Operation of a lab-on-a-chip optical device using model assays and real time measurements (Dr Konstantinos Misiakos).
<b>12:30-13:30</b>	<i>Lunch break</i>
<b>13:30-15:00</b>	<u>Lecture 3.3</u> : Lab on chip devices: Principles, applications, opportunities. (Dr Joel Rossier)
<b>15:00-15:15</b>	<i>Coffee Break</i>
<b>15:15-16:20</b>	<u>Lecture 3.2</u> : Acoustic wave sensors: from device fabrication to biological applications – part 1(Dr Elektra Gizeli)
<b>16:20-16:30</b>	<i>Coffee Break</i>
<b>16:30-17:30</b>	<u>Lecture 3.2</u> : Acoustic wave sensors: from device fabrication to biological applications – part 2 (Dr Elektra Gizeli)

### **MONDAY, 3 JULY– NCSR “DEMOKRITOS”**

<b>9:00-12:30 (shift 2)</b>	<p><u>Laboratory 2.1.1</u>: Fabrication of microfluidic devices on plastic substrates by lithographic techniques (Dr Angeliki Tserepi)</p> <p><u>Laboratory 2.1.2</u>: Fabrication of plastic microfluidic Devices by Lithography and deep polymer plasma etching techniques. (Dr Evangelos Gogolides)</p> <p><u>Laboratory 2.1.3</u>: Electrical characterization of tunneling devices based on organic molecules or biomolecules (Dr Nikos Glezos):</p> <p><u>Laboratory 2.3.4+2.3.5</u>: Fabrication of protein microarrays using lithography (Dr Margarita Chatzichristidi) Fluorescence detection of protein arrays (Dr Panagiota Petrou).</p> <p><u>Laboratory 3.1</u>: Operation of a lab-on-a-chip optical device using model assays and real time measurements (Dr Konstantinos Misiakos).</p>
<b>12:30-13:30</b>	<i>Lunch break</i>
<b>13:30-17:00 (shift 3)</b>	<p><u>Laboratory 2.1.1</u>: Fabrication of microfluidic devices on plastic substrates by lithographic techniques (Dr Angeliki Tserepi)</p> <p><u>Laboratory 2.1.2</u>: Fabrication of plastic microfluidic Devices by Lithography and deep polymer plasma etching techniques. (Dr Evangelos Gogolides)</p> <p><u>Laboratory 2.1.3</u>: Electrical characterization of tunneling devices based on organic molecules or biomolecules (Dr Nikos Glezos):</p> <p><u>Laboratory 2.3.4+2.3.5</u>: Fabrication of protein microarrays using lithography (Dr Margarita Chatzichristidi) Fluorescence detection of protein arrays (Dr Panagiota Petrou).</p> <p><u>Laboratory 3.1</u>: Operation of a lab-on-a-chip optical device using model assays and real time measurements (Dr Konstantinos Misiakos).</p>

### **TUESDAY, 4 JULY– NCSR “DEMOKRITOS”**

<b>9:00-9:45</b>	<u>Lecture 2.2.1</u> : Targeting RNA with small molecules; a Pharmaceutical Industry Study (Dr Dionysios Vourloumis)
<b>9:45-10:30</b>	<u>Lecture 2.2.2 and 2.2.3: (part 1)</u> Drug Release and Delivery Systems Why controlled release. Advantages of controlled drug release Polymers in controlled drug release (Dr Kyriaki Papadokostaki)
<b>10:30-10:45</b>	<i>Coffee Break</i>
<b>10:45-11:30</b>	<u>Lecture 2.2.2 and 2.2.3: (part 2)</u> Drug Release and Delivery Systems Dendrimers as Drug Delivery Systems (Dr Constantinos Paleos) Liposomes as Drug Delivery Systems (Dr Constantinos Paleos)
<b>11:30-12:15</b>	<u>Lecture 2.2.2 and 2.2.3: (part 3)</u> Drug Release and Delivery Systems Cyclodextrins as molecular carriers (Dr Irene. Mavridis or Dr Konstantina Yannakopoulou)
<b>12:15-13:15</b>	<i>Lunch break</i>

13:15-14:45	Lecture 2.2.4: Bioengineered nanomaterials (Dr Anna Mitraki)
15:00	Excursion to Cape Sounion
20:00	Dinner
<b>WEDNESDAY, 5 JULY– NCSR “DEMOKRITOS”</b>	
9:00-10:30	Lecture 2.3.5: Metabolomics in the Post-Genomic Era (Dr Maria I. Klapa)
10:30-11:00	Coffee Break
11:00-12:30	Lecture 2.2.6: Imaging with Scanning Probes (AFM, STM, SNOM) (Dr Martin Benninck)
12:30-13:30	Lunch break
13:30-14:20	Lecture 2.2.5: Magnetic Nanoparticles for Bioapplications (Dr Ioannis Rabias)
14:20-14:30	Coffee Break
14:30-15:20	Lecture 2.2.7: Experimental techniques for magnetic characterization of ferrofluids and Applications of ferrofluids in medicine (Dr Michael Fardis)
15:20-15:30	Coffee Break
15:30-17:00	Lecture 2.3.7: Applied Bioinformatics in BioNanoTechnology (Dr Georgios Spyrou)
<b>THURSDAY, 6 JULY– NCSR “DEMOKRITOS”</b>	
9:00-9:45	Lecture 2.2.2 and 2.2.3: (part 4) Drug Release and Delivery Systems Why controlled release. Advantages of controlled drug release NMR spectroscopy, X-ray diffraction characterisation of drug inclusion (Dr Konstantina Yannakopoulou, Dr Irene Mavridis)
9:45-10:00	Coffee Break
10:00-13:30 (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 Konstantina Yannakopoulou, Dr Emmanuel Saridakis). Laboratory 2.2.2+2.2.3: Liposomes: preparation and characterisation by dynamic light scattering and $\zeta$ -potential (Dr Dimitrios Tsiourvas). Video enhanced optical microscopy and Atomic Force Microscopy of Liposomes (Dr Dimitrios Tsiourvas). Laboratory 2.2.5+2.2.6: Magnetic nanomaterials for bio applications (Dr Ioannis Rabias) MRI for Biomedical applications (Dr Michael Fardis) Laboratory 3.2: Demonstration of a capillary fluoroimmunosensor. (Dr Sotirios Kakabakos.)
13:30-14:30	Lunch break
14:30-18:00 (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 Konstantina Yannakopoulou, Dr Emmanuel Saridakis). Laboratory 2.2.2+2.2.3: Liposomes: preparation and characterisation by dynamic light scattering and $\zeta$ -potential (Dr Dimitrios Tsiourvas). Video enhanced optical microscopy and Atomic Force Microscopy of Liposomes (Dr Dimitrios Tsiourvas). Laboratory 2.2.5+2.2.6: Magnetic nanomaterials for bio applications (Dr Ioannis Rabias) MRI for Biomedical applications (Dr Michael Fardis) Laboratory 3.2: Demonstration of a capillary fluoroimmunosensor. (Dr Sotirios Kakabakos)

**FRIDAY, 7 JULY– NCSR “DEMOKRITOS”**

<b>9:00-12:30 (shift 3)</b>	<p><u>Laboratory 2.2.1:</u> Drug inclusion in cyclodextrins: monitoring in situ by NMR spectroscopy, X-ray diffraction characterisation of drug inclusion and 3-D visualisation. (Dr Konstantina Yannakopoulou, Dr Emmanuel Saridakis).</p> <p><u>Laboratory 2.2.2+2.2.3:</u> Liposomes: preparation and characterisation by dynamic light scattering and <math>\zeta</math>-potential (Dr Dimitrios Tsiourvas). Video enhanced optical microscopy and Atomic Force Microscopy of Liposomes (Dr Dimitrios Tsiourvas).</p> <p><u>Laboratory 2.2.5+2.2.6:</u> Magnetic nanomaterials for bio applications (Dr Ioannis Rabias) MRI for Biomedical applications (Dr Michael Fardis)</p> <p><u>Laboratory 3.2:</u> Demonstration of a capillary fluoroimmunosensor. (Dr Sotirios Kakabakos,)</p>
<b>13:00-13:30</b>	<i>Closing ceremony</i>
<b>13:30-14:30</b>	<i>Lunch</i>