NanoProteomics
Summer Course 2018

POWERED BY BIOSCOPE GROUP
23rd - 27th July 2018

Faculty of Sciences and Technology (FCT NOVA), Caparica, Portugal
http://summercourse.bioscopegroup.org/

INNOVATION. COLLABORATION. BEYOND SCIENCE.

THE EARLIER YOU APPLY, THE MORE LIKELY IT IS FOR YOU TO BE ACCEPTED

ONLY 16 PLACES AVAILABLE

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FCT
THE HISTORY OF

NANOTECHNOLOGY

1857
Michael Faraday discovered the metallic gold colloids, which led to the discovery of the Faraday-Tyndall effect. For this reason, Faraday is considered one of the first researchers into the nanoscience and nanotechnology field.

1925
Richard Adolf Zsigmondy wins the Nobel Prize in Chemistry. First observations and size measurements of nanoparticles.

1951
Erwin Müller invented the field ion microscope. He was the first one to ever experimentally observe atoms.

1959
Richard Feynman gave what is considered as the first lecture on nanotechnology and nanoscience entitled, “There’s Plenty of Room at the Bottom.”

1974
Norio Taniguchi first used the term “Nanotechnology” in a paper where he described the characteristic controls on the order of a nanometer.

1980s
K. Eric Drexler developed the term of Nanotechnology and created the field of Molecular Nanotechnology.

1981
Gerd Binnig and Heinrich Rohrer invented the scanning tunneling microscope, which allowed scientists to see individual atoms for the first time.

1985
The Interagency Working Group on Nanotechnology (IWGN) was formed.

2000s

2006
James Tour and colleagues at Rice University build a nanoscale car.

PROTEOMICS

1971
Automated Edman sequencing, ELISA technique.

1977
DNA Sequencing (Sanger Method).

1979
First software for DNA sequence assembly.

1988
MALDI-TOF (>10 kD), phage display, DNA pyrosequencing invented.

1994
Introduction of the concept of PROTEOME. Correlation of tandem MS data with protein databases.

1996
Yeast PROTEOME (MALDI/ESI), real-time DNA pyrosequencing, Data-controlled automated LC-MS/MS.

2002
Yeast phosphoproteome, SILAC labelling, PAI.

2005
454 pyrosequencing, emPAI.

2008
Absolute SILAC.

2010
Large-scale ab initio gene discovery from MS/MS data, MIPA quantitation.

“...The combination of nanotechnology with proteomic analysis will be of significant importance in developing miniaturized analytical nanomaterials, including separation media and channels at nanoscale levels for biomedical research...”

Lee Jia et al, 2013
OUR TEACHERS

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THE COURSE

THE LEARNING OUTCOMES

- Synthesis of magnetics nanoparticles
- Functionalization of magnetic nanoparticles
- Conjugation of antibodies to magnetic nanoparticles
- Use of nanoparticles in proteomics: Simplifying the proteome.
- Mass spectrometry-based proteomics
- Protein identification & quantification

COURSE OUTLINE

Nano-synthesis and characterization

- Synthesis of magnetic nanoparticles
- Antibody functionalization of magnetic nanoparticles
- Characterization of magnetic nanoparticles by DLS and Z-potential

Proteomics

- Proteome extraction, clean-up and total protein quantification
- Nano-immunoaffinity purification and proteome fractionation
- Proteomics sample preparation: in-gel and in-solution.
- Proteomics sample preparation: 1D-gel electrophoresis
- Protein identification by Mass Spectrometry techniques (MALDI-TOF MS and ESI-MS/MS)
- Protein quantification by Mass Spectrometry (ESI-MS/MS)
- Bioinformatics
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<tr>
<td>09:00</td>
<td>Registration</td>
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<tr>
<td>09:30</td>
<td>Introduction to Proteomics</td>
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<td>Coffee Break</td>
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<td>Introduction to Nanoparticles</td>
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<td>14:00</td>
<td>Hands-on A: Nanosynthesis I - Synthesis of NanoParticles</td>
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<td>Theory II</td>
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<td>Hands-on A: Proteomics I - Protein extraction, clean-up &amp; total protein quantification</td>
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<td>16:30</td>
<td>Hands-on A: Proteomics II - Nano-immunoaffinity purification proteome fractionation</td>
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<td>Professor José Catita</td>
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<td>A: Nano-characterization DLS</td>
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<td>B: Proteomics Sample Preparation I</td>
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<td>19:30</td>
<td>SUNSET @ Costa da Caparica</td>
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<td>16:30</td>
<td>ALL TOGETHER - Beach Time @ Costa da Caparica</td>
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### 27th July 2018 (Friday)

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VENUE
Faculty of Sciences and Technology (FCT NOVA)

PRICES
SINGLE TICKET: 600€
GROUP OF 2: 570€ (save 5%)
GROUP OF 3 OR MORE: 540€ (save 10%)

APPLY NOW
For more information visit: www.summercourse.bioscopegroup.org
Or e-mail Professor Capelo at jlcm@fct.unl.pt (subject: Summer Course 2018)
Or by phone at +351 919 404 933
Recommended Accommodation

Mercure Almada (****)

WHY THIS HOTEL?
This Hotel has direct connection with the University through the tram. The Tram station is 450m away from the Hotel and there you can purchase a ticket to take you to the University (line 3 of the Tram Station. Destination: University). The Tram Station near the Hotel is called “Ramalha”. A single Tram ticket (one way) costs 0,85€ or 0,75€ (if you purchase 10 at a time).


Hotel Aldeia dos Capuchos (****)

WHY THIS HOTEL?
This Hotel has an excellent location, as it is 5 min away from the Caparica Beach and it has a SPA, Pool and a Golf facility. Also, the food and the amazing views ensures its quality. In order to go to the University from here, you should pick up a Taxi (5 to 8€, one ride). You can call for a taxi in the reception of the hotel.

http://www.aldeiadoscapuchos.pt/hotel-overview.html
Recommended Accommodation

**TRYP Lisboa Caparica Mar Hotel (****)**

**WHY THIS HOTEL?**

This Hotel has an excellent location as it is just in front of the Caparica Beach. In order to go to the University you should pick a Taxi. One single journey costs approximately 5 to 8€. You can call for a taxi in the reception of the hotel.

[http://www.tryplisboacaparica.com](http://www.tryplisboacaparica.com)