Nano Proteomics 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.

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ONLY 16 PLACES AVAILABLE

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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

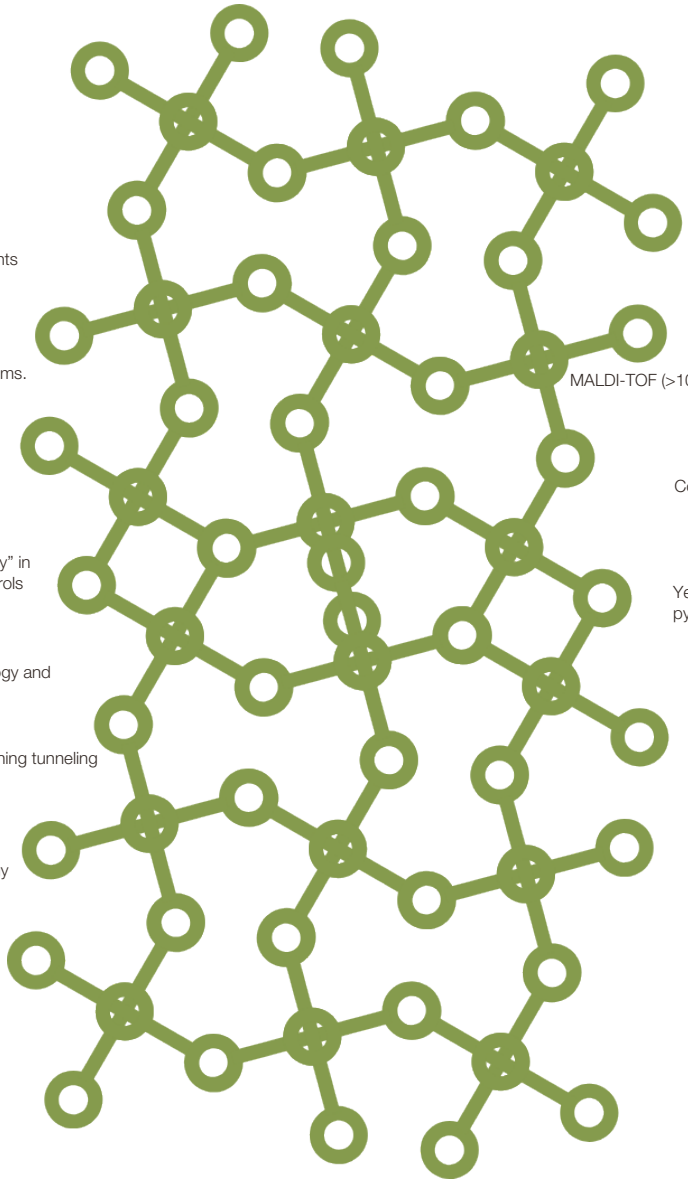
1980s
K. Eric Drexler developed the term of Nanotechnology and created the field of Molecular Nanotechnology

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
National Nanotechnology Initiative (NNI). Nanotechnology reaches the marketplace

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

SCHEDULE

NP 2018

23RD - 27TH July 2018

	23RD JULY 2018 (MONDAY)
09:00	Registration
09:30	Introduction to Proteomics
10:30	Coffee Break
11:30	Introduction to Nanoparticles
12:30	Networking Lunch
14:00	Hands-on A: Nanosynthesis I - Synthesis of NanoParticles | Hands-on B: Proteomics I - Protein extraction, clean-up & total protein quantification
16:00	Coffee Break
16:30	Hands-on A: Nanosynthesis I - Synthesis of NanoParticles | Hands-on B: Proteomics II - Nano-immunoaffinity purification & proteome fractionation
	24TH JULY 2018 (TUESDAY)
09:30	Theory II
10:30	Coffee Break
11:30	Theory III
12:30	Networking Lunch
14:00	Hands-on A: Proteomics I - Protein extraction, clean-up & total protein quantification | Hands-on B: Nanosynthesis I - Synthesis of nanoparticles
16:00	Coffee Break
16:30	Hands-on A: Proteomics II - Nano-immunoaffinity purification proteome fractionation | Hands-on B: Nanosynthesis I - Synthesis of nanoparticles
	25TH JULY 2018 (WEDNESDAY)
08:30	Professor José Catita
09:30	Professor Luís Spencer Lima
09:30	A: Nano-characterization DLS | B: Proteomics Sample Preparation I
10:30	Coffee Break
11:30	B: Proteomics Sample Preparation I | A: Nano-characterization DLS
12:30	Networking Lunch
14:00	A | B : Proteomics Sample Preparation II
16:00	Coffee Break
16:30	A | B : Proteomics Sample Preparation III
19:30	**SUNSET @ Costa da Caparica**
	26TH JULY 2018 (THURSDAY)
09:30	Professor Ruedi Aebersold
09:30	A | B : MS Data Acquisition
10:30	Coffee Break
11:30	A | B : MS Data Acquisition
12:30	Networking Lunch
14:00	A | B : Protein Identification & Quantification BioInformatics
16:00	Coffee Break
16:30	**ALL TOGETHER - Beach Time @ Costa da Caparica**

SCHEDULE

NP 2018

23RD - 27TH July 2018

	27TH JULY 2018 (FRIDAY)
09:30	A | B : Roundtable Session I
10:30	Coffee Break
11:00	A | B : Roundtable Session II | Closing Remarks
12:30	Networking Lunch

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).

http://www.mercure.com/gb/hotel-A040-mercure-lisboa-almada-hotel/index.shtml

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