

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 Muller invented the field ion microscope. He was the first one to ever experimentally observe atoms.

1959

Richard Feynman gave 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

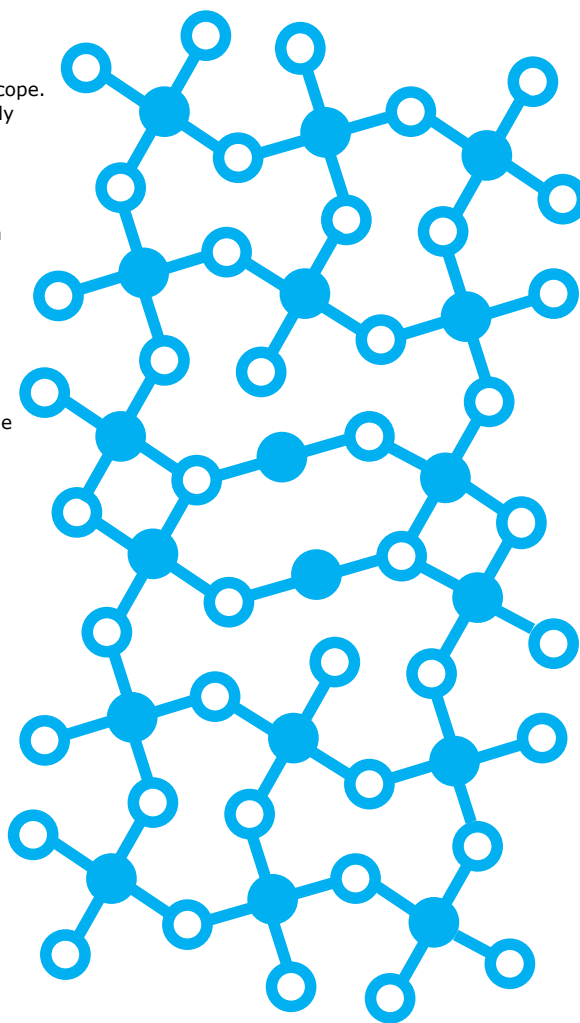
454 pyrosequencing, emPAI

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

LEARNING OUTCOMES

- Synthesis of magnetic 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: 1D-Gel electrophoresis
- Proteomics sample preparation: in-gel and in-solution digestion
- Protein identification and quantification by mass spectrometry
- Bioinformatics

THE VENUE

Faculty of Science and Technology, FCT – NOVA
Caparica Campus



PRICES

SINGLE TICKET: **600€**

GROUP OF 2: **570€ (save 5%)**

GROUP OF 3 OR MORE: **540€ (save 10%)**

APPLY NOW

For more information visit: <http://summercourse.bioscopegroup.org>

Or e-mail Prof. Capelo at jlcm@fct.unl.pt (subject Summer Course 2019)

Or by phone at **+351 919 404 933**



RECOMMENDED ACCOMODATION

MERCURE Almada (****)

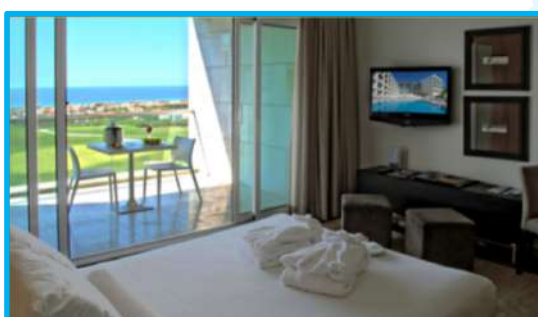


WHY THIS HOTEL?

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 ACCOMODATION

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>

