

Both Face-to-face and On-line

Mass Spectrometry Proteomics-based Diagnostic & Prognostic Winter Course 2024

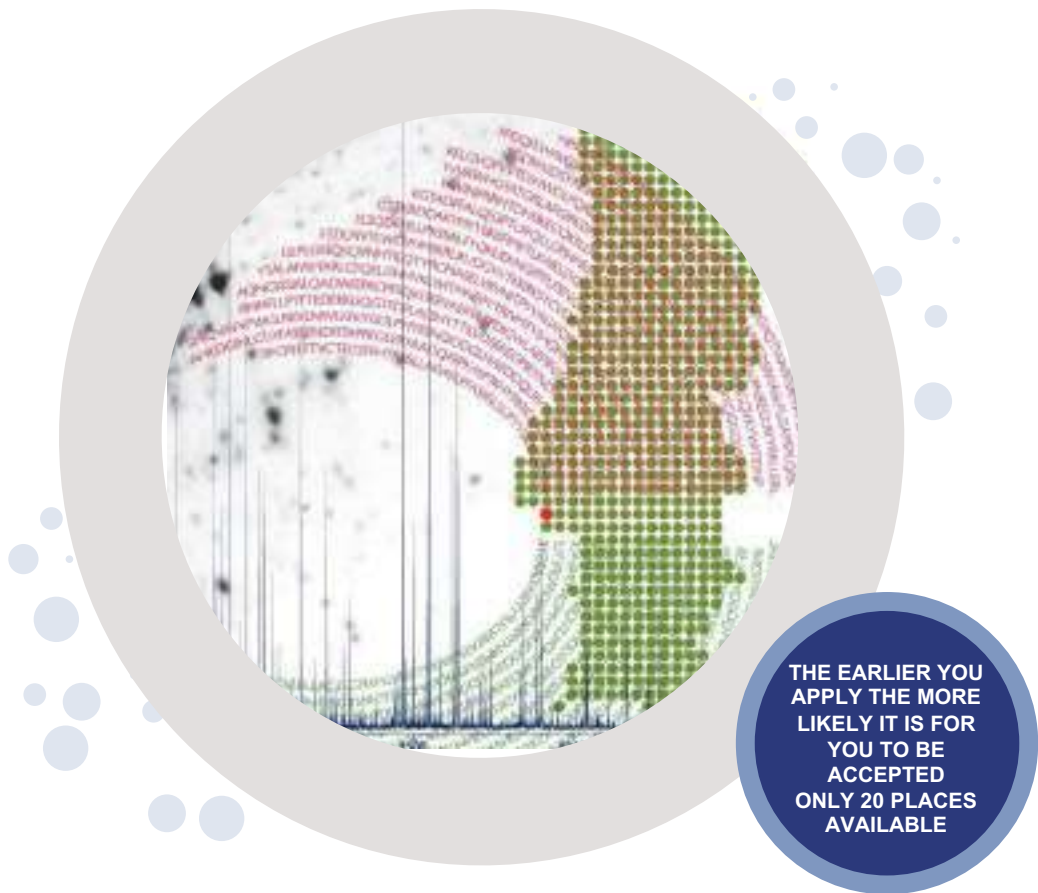
Powered by the BIOSCOPE Research Group

18th November – 22th November 2024

NOVA School of Science and Technology (FCT – NOVA), Caparica, Portugal

<https://wintercourse.bioscopegroup.org>

INNOVATION. COLLABORATION. BEYOND SCIENCE.



**THE EARLIER YOU
APPLY THE MORE
LIKELY IT IS FOR
YOU TO BE
ACCEPTED
ONLY 20 PLACES
AVAILABLE**

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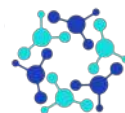


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NOVA
NOVA SCHOOL OF
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**BIOSCOPE
RESEARCH**
In the forefront of science



**LACV
requimte
NOVAiD**

OUR TEACHING STAFF

COURSE DIRECTOR



Hugo M. Santos, PhD
NOVA University of Lisbon
(Portugal)

INVITED PROFESSORS



Jacek Wisniewski, PhD
Max-Planck-Institute of
Biochemistry
(Germany)



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(Italy)



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BIOSCOPE GROUP'S PROFESSORS



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THE HISTORY OF...

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

Aptamer-based multiplexed proteomics

2015

Advancements in Data-Independent Acquisition (DIA) Mass Spectrometry

2016

Trapped Ion Mobility Spectrometry

2018

Parallel accumulation-serial fragmentation (PASEF)

2023

Prescriptomics

PERSONALIZED MEDICINE

1960's

Early research in pharmacogenetics began to reveal how genetic differences affect individual responses to drugs, laying the groundwork for personalized medication regimens

1990's

Discovery of BRCA1 and BRCA2 Genes

1998

The FDA approved Herceptin (trastuzumab) for the treatment of HER2-positive breast cancer, marking a significant step in targeted therapy based on genetic markers

2000's

Introduction of Gene Expression Profiling

2003

The successful completion of the Human Genome

2005

Completion of HapMap Project, facilitating studies on genetic contributions to common diseases

2007

James Watson, co-discoverer of the DNA double helix, became the first person to have his entire genome sequenced, ushering in an era of personal genomics

2010's

Cancer Immunotherapy Advancements

2012

The discovery and development of CRISPR-Cas9 technology revolutionized genetic research and therapeutic possibilities, enabling precise editing of the genome for potential treatments of genetic disorders

2012

Kalydeco (ivacaftor) was the first drug approved to treat cystic fibrosis in patients with specific genetic mutations, exemplifying targeted therapy based on genetic testing

“ ... With the sequencing of the human genome, personalized medicine is becoming a reality. In the future, medical treatments will be tailored to the individual genetic needs of each patient... ”

James D. Watson

THE COURSE

LEARNING OUTCOMES

- Sample treatment of complex proteomes
- Protein identification and protein quantification of complex proteomes
- Mass spectrometry-based diagnostic & prognostic
- Bioinformatics I: Protein identification and data normalization (MaxQuant & Perseus)
- Bioinformatics II: Cytoscape – pathways analysis
- Bioinformatics III: Differential Personalized Pathway Index (dPPi) & Total Protein Approach (TPA)

COURSE OUTLINE

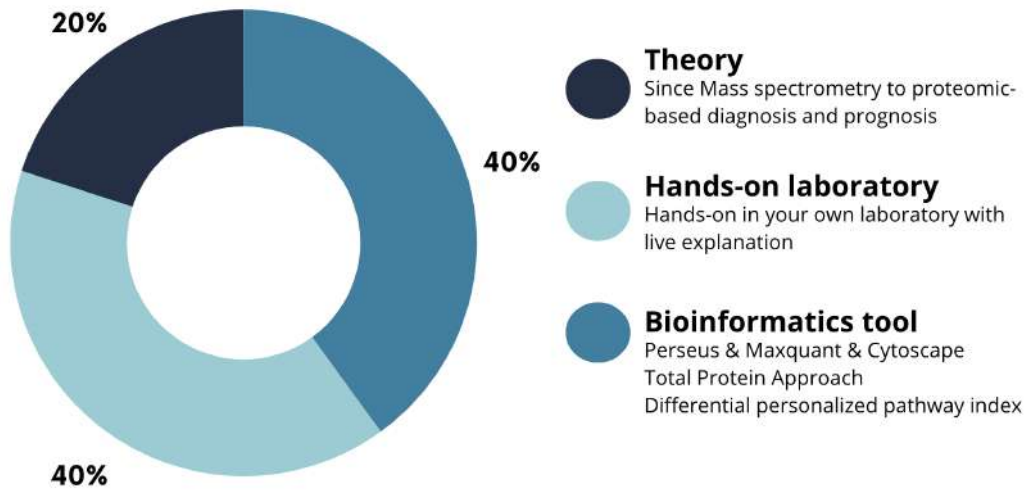
Sample treatment & Protein identification

- Sample treatment and protein quantification
- Proteomic sample preparation: Filter Aided Sample Preparation (FASP)

Proteomics & Diagnosis and Prognosis

- Protein identification by Mass Spectrometry: MaxQuant
- Label-free quantification by MS: Total Protein Approach (TPA)
- Bioinformatics: MaxQuant, Perseus & Cytoscape (different datasets)
- Differential Personalized Pathway Index (dPPi) for diagnosis and prognosis

MANDATORY REQUIREMENTS TO ONLINE COURSE



Review all mandatory requirements before enrolment to be eligible for participation

All samples and necessary reagents are delivered by us!

MANDATORY MATERIAL TO BE ELIGIBLE FOR ON-LINE FORMAT:

- Laboratory workspace with internet connection
- Centrifuge & ultrasonic bath/ Thermostatic Bath/ Incubator
- Computer with previews installed Perseus & Cytoscape programs

REGISTRATION FEE INCLUDES:

- Manual with theoretical and practical classes
- Labcoat & package with all reagents and solutions needed
- Certificate of participation

To register contact both:
hugosantos@bioscopegroup.org
ines.domingos@bioscopegroup.org

Winter Course 2024

18th - 22th November

Note that time zone is Portugal (GMT +1)

18th November | Monday

9:00	Registration
9:30	Introduction to Mass Spectrometry-based Proteomics Professor Capelo
10:30	Coffee break
11:00	Sampling and preservation of biopsies Laura Mercolini
12:00	Networking Lunch
13:30	Hands-on I: Sample treatment and protein quantification Professor Carvalho & Professor Domingos
16:00	Coffee break
16:30	Hands-on II: Filter Aided Sample Preparation (FASP) Professor Carvalho & Professor Domingos

19th November | Tuesday

9:30	Hand-on II: Filter Aided Sample Preparation protocol (FASP) quantification Professor Carvalho & Professor Domingos
10:30	Coffee break
11:15	MS-based proteomics applied to psychiatric disorders Professor Daniel Martins-de-Souza
13:15	Networking Lunch
14:30	Hands-on II: Filter Aided Sample Preparation protocol (FASP) quantification Professor Carvalho & Professor Domingos
16:00	Coffee break
16:30	Hands-on III: HPLC and Mass spectrometer visit Professor Santos

20th November | Wednesday

9:30 Soon available | Professor Nataly

10:30 Coffee break

11:15 Bioinformatic I: MaxQuant | Luís B. Carvalho, Professor Santos & Capelo

12:30 Networking Lunch

14:00 Bioinformatic I and II: Perseus & Cytoscape | Luís B. Carvalho, Professor Santos & Capelo

16:00 Coffee break

16:30 Bioinformatic II: Cytoscape | Professor Carvalho, Santos & Capelo

21th November | Thursday

10:00 Implementation of Personalized Medicine in hospitals | Professor Simmaco

11:00 Coffee break

11:30 Bioinformatics I, II and III | Luís B. Carvalho, Professor Santos & Capelo

12:30 Networking Lunch

14:00 Bioinformatics III - dPPi | Luís B. Carvalho

16:00 Coffee break

16:30 ALL TOGETHER - Beach time
@ Costa da Caparica

22th November | Friday

9:30 Total Protein Approach (TPA) | Professor Wisniewski

10:30 Coffee break

11:00 Bioinformatics III - TPA practical application | Professor Wisniewski

13:00 Networking Lunch

THE VENUE

Faculty of Science and Technology, FCT – NOVA Caparica Campus

Take a look at this → <https://www.youtube.com/watch?v=8DAZq40wmMo>



PRICES

SINGLE TICKET PRESENCIAL: **1 000 €**

SINGLE TICKET ONLINE: **1 200 €**

GROUP DISCOUNT ON DEMAND: ines.domingos@bioscopegroup.org

Please note that the ticket does not include accommodation

APPLY NOW

For more information visit: <https://wintercourse.bioscopegroup.org>

Or e-mail Prof. Hugo Santos at hugosantos@bioscopegroup.org

Or e-mail Inês Domingos at ines.domingos@bioscopegroup.org

Or via whatsapp **+351 919 404 933 (Prof. Capelo)**



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).

<https://www.mercure.com/gb/hotel-A040-mercure-lisboa-almada-hotel/index.shtml>

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.

<https://www.tryplisboacaparica.com>

RECOMMENDED ACCOMODATION

Hotel Residencial COLIBRI (**)



WHY THIS HOTEL?

This Hotel Colibri is located 400 meters from Caparica beach with low-cost rooms and an excellent breakfast. 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.

<https://hcolibri.com/>

WOT Costa da Caparica Hotel (**)



WHY THIS HOTEL?

This WOT Hotel is located 500 meters from Caparica beach and an excellent breakfast. 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.

<https://www.wotels.com/wotcostadacaparica/>