Nano Proteo Genomics Summer Course 2017

POWERED BY BIOSCOPE GROUP

10th - 21st July 2017

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 FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

THE HISTORY OF

GENOMICS

1871
Friedrich Miescher publishes his paper identifying the presence of 'nuclein' (now known as DNA) and associated proteins, in the cell nucleus.

1904
Walter Sutton and Theodor Boveri propose the chromosome theory of heredity after finding that chromosomes occur in matched pairs, one inherited from the mother and one from the father.

1980
Fred Sanger shares the Nobel Prize for Chemistry with Wally Gilbert and Paul Berg, for pioneering DNA sequencing methods.

1985
Alec Jeffreys develops a method for DNA profiling. A DNA profile is produced by counting the number of short repeating sequences of DNA sequence found at ten specific regions of the genome.

1990
Human Genome Project is launched. The project aims to sequence all 3 billion letters of a human genome in 15 years.

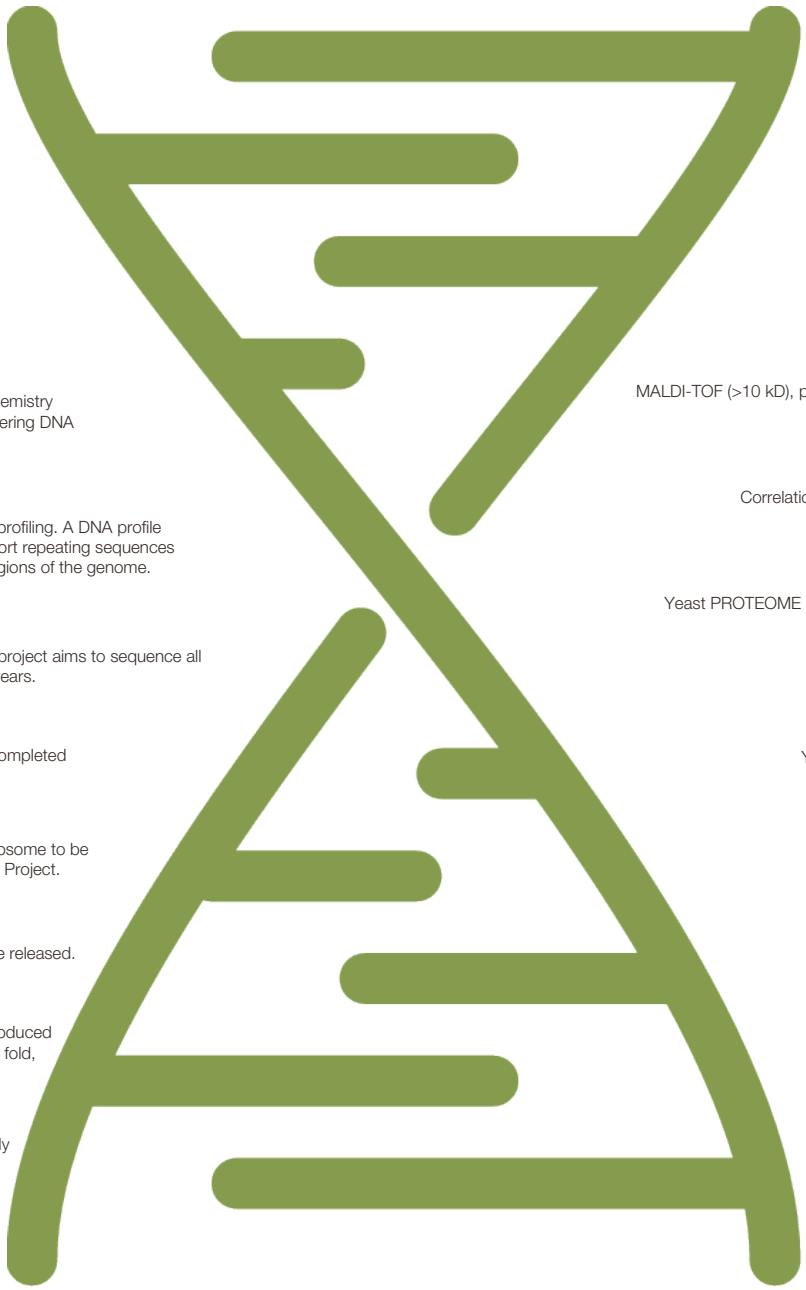
1995
The first bacterium genome sequence is completed (Haemophilus influenza).

1999
Chromosome 22 is the first human chromosome to be sequenced as part of the Human Genome Project.

2001
First draft of the human genome sequence released.

2007
A new DNA sequencing technology is introduced that increases DNA sequencing output 70 fold, in one year!

2013
The U.S. Supreme Court rules that naturally occurring DNA cannot be patented.



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

"…Proteogenomics, the integration of proteomics with genomics, is an emerging approach that promises to advance clinical & translational research. By combining genomic and proteomic information, leading scientists are gaining new insights due to a more complete and unified understanding of complex biological processes."

Lisa Thomas, Thermo Fischer Scientific Inc.

OUR TEACHERS

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THE COURSE

THE LEARNING OUTCOMES

- Synthesis of nanoparticles: gold, silica and magnetic ones.
- Decoration of Gold nanoparticles: attaching antibodies and proteins
- Use of nanoparticles in proteomics: Simplifying the proteome.
- Functionalized Magnetic@Silica Nanoparticles with Antibodies
- Profiling diseases.
- Tissue proteomics.
- Fishing proteins in tissues with nanoparticles.
- Protein identification: Shot Gun.
- Protein quantification using 18O
- Proteogenomics

COURSE OUTLINE

Proteomics I

- Protein extraction, clean-up and total protein quantification

Proteomics II

- 1D-SDS-PAGE and 2D-Gel Electrophoresis

Proteomics III

- Proteomics sample preparation: in-gel and in-solution digestion

Bioinformatics I

- 2D-Gel Analysis - Protein expression profiling
- Main databases for research of scientific literature, DNA, RNA and protein sequences genome and structure of the molecules

Bioinformatics II

- Identification, characterisation and quantitation of proteins using mass spectrometry data (ESI/MALDI)

Nano-characterization

- Characterization of Nanomaterials by UV-vis, Fluorescence, IR and DLS

Nano-immuno capturing

- Isolation and characterization of target proteins using Gold-nano-Antibodies

Mass Spectrometry I

- MS sample preparation

Mass Spectrometry II

- MALDI-TOF MS

Mass Spectrometry III

- LC-ESI MS/MS

Nano-synthesis I

- Synthesis of Gold, Magnetic Nanoparticles

Nano-synthesis II

- Functionalization of Gold, Magnetic and Magnetic Silica Layer Nanoparticles w/ Antibodies

Genomics I

- Genome projects and model organisms

Genomics II

- Comparative genomics and molecular evolution

Genomics III

- Phylogenetic analysis and data integration

SCHEDULE

WEEK ONE

11TH - 16TH July 2017

	10TH JULY 2017 (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: Proteomics I - Protein extraction, clean-up and total protein quantification
16:00	Coffee Break
16:30	Hands-On: Proteomics II - 2D-Gel Electrophoresis
	11TH JULY 2017 (TUESDAY)
09:30	Hands-On: Proteomics II - 2D-Gel Electrophoresis
10:30	Coffee Break
11:30	Theory I
12:30	Networking Lunch
14:00	Hands-On: Nanosynthesis I - Synthesis of Nanoparticles
16:00	Coffee Break
16:30	Hands-On: Proteomics II - 2D-Gel Electrophoresis
17:30	**ALL TOGETHER - Beach Time @ Costa da Caparica**
	12TH JULY 2017 (WEDNESDAY)
09:30	Theory II
10:30	Coffee Break
11:30	Theory III
12:30	Networking Lunch
14:00	Hands-On: Nanosynthesis II - Functionalization of Nanoparticles with Antibodies
16:00	Coffee Break
17:30	**Roundtable Session**
	13TH JULY 2017 (THURSDAY)
09:30	Nano-Characterization I - UV-Vis
10:30	Coffee Break
11:30	Nano-Characterization II - DLS
12:30	Networking Lunch
14:00	Hands-On: Nano-immuno capturing - Isolating and characterization of target proteins using Nano-Antibodies
16:00	Coffee Break
17:00	**ALL TOGETHER - Beach Time @ Costa da Caparica**
19:30	**SUNSET @ Costa da Caparica**

SCHEDULE

WEEK ONE

11TH - 16TH July 2017

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	14TH JULY 2017 (FRIDAY)
09:30	de novo peptide sequencing - Professor José Luís Capelo Martínez | FCT-UNL (Portugal)
10:30	Coffee Break
11:30	Nanodrugs and Proteomics - Professor Julia Ljubimova | Cedars-SINAI LA (USA)
12:30	Networking Lunch
14:00	Drug Delivery with Nano - Professor Holler Eggehard | Cedars-SINAI LA (USA)
15:00	Coffee Break
15:30	Proteogenomics - Professor William LaFramboise | University of Pittsburgh Cancer Institute (USA)
16:30	**Roundtable Session**
	15TH JULY 2017 (Saturday)
14:00	**VISIT TO SINTRA**

	16TH JULY 2017 (Sunday)
	FREE DAY

SCHEDULE

WEEK TWO

17TH - 21ST July 2017

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	17TH JULY 2017 (MONDAY)
09:30	Theory IV
10:30	Coffee Break
11:30	Theory VI
12:30	Networking Lunch
14:00	Hands-On: Bioinformatics I - 2D-Gel Analysis - Protein expression profiling
16:00	Coffee Break
16:30	Hands-on : Proteomics III - Proteomics sample preparation in-gel and in-solution digestion
	18TH JULY 2017 (TUESDAY)
09:30	Hands-On : Proteomics III - Proteomics sample preparation
10:30	Coffee Break
11:30	Mass Spectrometry I - MS Sample Preparation
12:30	Networking Lunch
14:00	Mass Spectrometry II - MALDI TOF-MS - LC ESI MS/MS
16:00	Coffee Break
16:30	Mass Spectrometry II - MALDI TOF-MS - LC ESI MS/MS
17:30	**ALL TOGETHER - Beach Time @ Costa da Caparica**
	19TH JULY 2017 (WEDNESDAY)
09:30	Theory IV
10:30	Coffee Break
11:30	Mass Spectrometry I - MS Sample Preparation
12:30	Networking Lunch
14:00	Mass Spectrometry II - MALDI TOF-MS - LC ESI MS/MS
16:00	Coffee Break
16:30	Mass Spectrometry II - MALDI TOF-MS - LC ESI MS/MS
17:30	Genomics I
	20TH JULY 2017 (THURSDAY)
09:30	Bioinformatics II - Protein Id. and Quantification
10:30	Coffee Break
11:30	Bioinformatics II - Protein Id. and Quantification
12:30	Networking Lunch
14:00	Genomics II
16:00	Coffee Break
16:30	Genomics III
17:30	**ALL TOGETHER - Beach Time @ Costa da Caparica**
19:30	**SUNSET @ Costa da Caparica**
	21ST JULY 2017 (FRIDAY)
09:30	**Roundtable Session**
12:00	**Closing Remarks**
12:30	**Networking Lunch**

VENUE

Faculty of Sciences and Technology (FCT NOVA)

Hotel Aldeia dos Capuchos

PRICES

WITH ACCOMMODATION

SINGLE TICKET: **2990€ (SR) | 2790€ (DSR)**
GROUP OF 2: **2841€ per person (SR) | 2651€ per person (DSR) (Save 5%)**
GROUP OF 3 OR MORE: **2691€ per person (SR) | 2511€ per person (DSR) (Save 10%)**

THIS FEES INCLUDE HOTEL ROOM, BREAKFAST AND DINNER AT HOTEL DOS CAPUCHOS.
LUNCH TAKES PLACE IN THE FACULTY FACILITIES
SR: Single Room | DSR: Double Shared Room

WITHOUT ACCOMMODATION

SINGLE TICKET: **2000€**

APPLY NOW

For more information visit: **www.summercourse.bioscopegroup.org**
Or e-mail Professor Capelo at **jlcm@fct.unl.pt (subject: Summer Course 2017)**
Or by phone at **+351 919 404 933**