Training PhD Biomolecular Sciences cycle 39

PhD Program Biomolecular Sciences

UNIVERSITÀ DEGLI STUDI DELLA CAMPANIA
LUIGI VANVITELLI
DIPARTIMENTO DI SCIENZE E TECNOLOGIE AMBIENTALI BIOLOGICHE E FARMACEUTICHE

Training PhD Biomolecular Sciences cycle 39

PhD training activities will start on **March 5st**. The lectures will be mostly held remotely by using platform Microsoft Teams (access code: **ao1rgmo**). Eventual lessons held in mixed mode (in presence/remote) will be announced in due time. All lessons are in English and the **attendance is mandatory for PhD students of cycle 39°.**

Sections of theoretical courses on topics of interest for the doctorate program:

- 1. Structural biology and protein function (I year, 14 hours)
- 2. Cell biology (I year, 8 hours)
- 3. Molecular bases of Human diseases (I year, 16 hours)
- 4. Immunology and Microbiology (I year, 8 hours)
- 5. Cancer Biology and Therapy (I year, 16 hours)
- 6. Drug design and development (I year, 8 hours)
- 7. Bioinformatics (I year, 10 hours)

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Training organized by the Vanvitelli PhD School in Life Sciences

- Course of Scientific writing (Started: I year, 15 hours; Prof. Jerome Tessuto);
- Rosetta Stone language Courses are available at the following link: https://www.unicampania.it/index.php/indexphp/corsi-di-lingua-rosetta-stone
- Medical Statistics with R software (To be scheduled: I year, 16 hours; Signoriello Simona and Simeon Vittorio)
- Machine Learning e Reti neurali (To be scheduled: II year, 16 hours; Di Martino Beniamino and D'Angelo Salvatore)

Structural biology and protein function (I year, 14 hours)

Reference Professor: Luigi Russo; luigi.russo2@unicampania.it

Topics

- Structural biology and human health (Dr. **Rita Berisio**; IBB-CNR)
- X-ray Crystallography: principles and applications (Dr. **Luigi Vitagliano**, IBB-CNR)
- NMR in structural biology (Prof. **Luigi Russo**, Università degli Studi della Campania Luigi Vanvitelli)
- A revolution in Structural Biology: principles, resolution, and perspectives of single particle cryo electron microscopy (Prof. **Martino Bolognesi**, Università degli Studi di Milano)
- Empowering Life Science Exploration: Artificial Intelligence (AI) meets Protein Structure Bioinformatics (Prof. **Domenico Raimondo**, Università di Roma Sapienza)
- Omics in Precison Medicine (Dr. **Andrea Petretto**, Istituto Gaslini)

Cell biology (I year, 8 hours):

Reference Professor: Pieter De Lange: pieter.delange@unicampania.it

Topics

- Cellular senescence: from physiology to pathology (Prof. **Maria Moreno**, Università del Sannio)
- Exerkines from muscle to brain (Prof. **Pieter De Lange**, Università degli Studi della Campania Luigi Vanvitelli)
- Genetics and brain disorders caused by ARX mutations (Dr. **Maria Giuseppina Miano**, IGB-CNR)
- Role of mitochondria in thermogenesis (Prof. **Assunta Lombardi**, Università di Napoli Federico II)

Molecular bases of Human diseases (I year, 16 hours)

Reference Professor: Andrea Riccio; andrea.riccio@unicampania.it

- The expanding world of cilia: from basic meccanisms to genetic disorders (Prof. **Brunella Franco**, Università di Napoli Federico II/Tigem)
- Disorders of genomic imprinting (Prof. **Andrea Riccio**, Università degli Studi della Campania Luigi Vanvitelli)
- An invertebrate model organism for understanding the molecular bases of human diseases: Caenorhabditis elegans (Dr. **Elia Di Schiavi**, IBBR-CNR)
- Angiogenesis in health and diseases (Dr. **Sandro De Falco**, IGB-CNR)
- Non-coding RNAs in health and disease (Prof. **Sandro Banfi**, Università degli Studi della Campania Luigi Vanvitelli/Tigem)
- Undiagnosed genetic diseases (Prof. **Vincenzo Nigro**, Università degli Studi della Campania Luigi Vanvitelli)
- Pangenomics (Dr. **Enza Colonna**, CNR)
- Epigenetic control of cellular identity and function in human disorders (Dr. **Maria Matarazzo**, IGB-CNR)

Immunology and Microbiology (I year, 8 hours)

Reference Professor: Mirko Cortese, mirko.cortese@unicampania.it

- Innate immunity (Dr. **Diana Boraschi**, Shenzhen Institute of Advanced Technology)
- Innate immune memory (Dr. **Paola Italiani**, IBBC-CNR)
- Introduction to virology (Prof. **Mirko Cortese**, Università degli Studi della Campania Luigi Vanvitelli)
- Adaptive immunity in cancer (Dr. **Luigi Buonaguro**, Istituto Nazionale Tumori IRCCS Fondazione Pascale)

Cancer Biology and Therapy (I year, 16 hours)

Reference Professor: Nicoletta Potenza; nicoletta.Potenza@unicampania.it

- Electrochemotherapy: in vitro and in vivo models of application (Prof. **Alfonso Baldi**, Università degli Studi della Campania Luigi Vanvitelli)
- Immunotherapy in cancer (Prof. **Aksam Merched**, Bordeaux University)
- Old and new frontiers in CAR T-cell therapy (Dr. **Vincenzo Giambra**, Fondazione Casa Sollievo della Sofferenza)
- Cancer Genomics in the Era of Precision Medicine (Dr. **Pietro Carotenuto**, Università di Napoli Federico II/Tigem)
- Telomere Targeting Approaches in Cancer: Beyond Length Maintenance (Dr. **Erica Salvati**, IBPM-CNR)
- Non-coding RNA in Cancer Biology (Prof. **Nicoletta Potenza**, Università degli Studi della Campania Luigi Vanvitelli)
- Metabolomics studies integrated with computational biology approaches for the research of novel cancer boimarkers and therapeutic strategies (Dr. **Susan Costantini**, Istituto Nazionale Tumori IRCCS Fondazione Pascale)
- Molecular and cellular mechanisms underlying skeletal tumours (Dr. **Fernando Gianfrancesco**, CNR)

Drug design and development (I year, 8 hours)

Reference Professor: Ivana D'Angelo; ivana.d'angelo@unicampania.it

Topics

- Targetting understudied G protein-coupled receptors for therapy (Prof. **Pawel Kozielewicz**, Karolinska Institutet)
- Delivery Systems for the Controlled Release of Active Molecules: a Glimpse of Pharmaceutical Sciences (Prof. **Ivana D'Angelo**, Università degli Studi della Campania Luigi Vanvitelli)
- Peptides as drugs: An old and new avenue for the treatment of human diseases (Prof. **Salvatore Di Maro**, Università degli Studi della Campania Luigi Vanvitelli)

Bioinformatics (I year, 10 hours)

Reference Professor: Sandro Cosconati; sandro.cosconati@unicampania.it

Topics

- Introduction to ChIPseq and ATAC-seq data Analysis (Dr. **Claudia Angelini**, CNR)
- Introduction to RNA-Seq data Analysis (Dr. **Annamaria Carissimo**, CNR)
- Practical Insights: Navigating Biomacromolecular Complexity with AI (Prof. **Domenico Raimondo**, Università di Roma Sapienza)
- From Receptor- to Artificial Intelligence-Based Methods in Drug Discovery (Prof. **Sandro Cosconati**, Università degli Studi della Campania Luigi Vanvitelli)

Mandatory Courses organized by Vanvitelli University in collaboration with Agency for the Promotion of European Research APRE

18 March 2024: “Introduction to Research in Horizon Europe: Focus on the 1° Pillar”
8 April 2024: “Introduction to Research in Horizon Europe: Focus on the 2° Pillar”
15 May 2024: “Introduction to Research in Horizon Europe: Focus on the 3° Pillar”
19 June 2024: “How to write a MSCA proposal with a focus on postdoctoral fellowships
10 July 2024: "How to write Infrastructure proposal"
20 September 2024: "COME SCRIVERE UNA PROPOSTA ERC" (INGLESE)
16 October 2024: "Open Science”
13 November 2024: "General Data Protection Regulation-GDPR" (Italian, not mandatory)

Additional not mandatory APRE Courses will be later defined

APRE
Agenzia per la Promozione della Ricerca Europea

Program

Month	Day	Time	Lecturer	*Section	topic
March	5	9.30-11.30	Brunella Franco	Molecular bases of Human diseases	The expanding world of cilia: from basic meccanisms to genetic disorders
March	5	11.30-13.30	Andrea Riccio	Molecular bases of Human diseases	Disorders of genomic imprinting
March	12	9.30-11.30	Maria Moreno	Cell Biology	Cellular senescence: from physiology to pathology
March	12	11.30-13.30	Pieter De Lange	Cell Biology	Exerkines from muscle to brain
March	19	9.30-11.30	Alfonso Baldi	Cancer Biology and Therapy	Electrochemotherapy: in vitro and in vivo models of application
March	19	11.30-13.30	Rita Berisio	Structural biology and protein function	Structural biology and human health
March	26	9.30-11.30	Diana Boraschi	Immunology and Microbiology	Innate immunity
March	26	11.30-13.30	Paola Italiani	Immunology and Microbiology	Innate immune memory

Program

Month	Day	Time	Lecturer	*Section	topic
April	2	9.30-11.30	Mirko Cortese	Immunology and Microbiology	Introduction to virology
April	2	11.30-13.30	Aksam Merched	Cancer Biology and Therapy	Immunotherapy in cancer
April	9	9.30-11.30	Vincenzo Giambra	Cancer Biology and Therapy	Old and new frontiers in CAR T-cell therapy
April	9	11.30-13.30	Elia Di Schiavi	Molecular bases of Human diseases	An invertebrate model organism for understanding the molecular bases of human diseases: Caenorhabditis elegans
April	16	9.30-11.30	Pietro Carotenuto	Cancer Biology and Therapy	Cancer Genomics in the Era of Precision Medicine
April	16	11.30-14.30	Luigi Vitagliano	Structural biology and protein function	X-ray Crystallography: principles and applications
April	23	9.00-11.30	Luigi Russo	Structural biology and protein function	NMR in structural biology
April	23	11.30-13.30	Martino Bolognesi	Structural biology and protein function	A revolution in Structural Biology: principles, resolution, and perspectives of single particle cryo electron microscopy
April	30	9.30-11.30	Maria Giuseppina Miano	Cell Biology	Genetics and brain disorders caused by ARX mutations
April	30	11.30-13.30	Assunta Lombardi	Cell Biology	Role of mitochondria in thermogenesis

Program

Month	Day	Time	Lecturer	*Section	topic
May	7	9.30-11.30	Pawel Kozielewicz	Drug design and development	Targetting understudied G protein-coupled receptors for therapy
May	7	11.30-14.30	Ivana d'Angelo	Drug design and development	Delivery Systems for the Controlled Release of Active Molecules: a Glimpse of Pharmaceutical Sciences
May	14	9.30-11.30	Luigi Buonaguro	Immunology and Microbiology	Adaptive immunity in cancer
May	14	11.30-14.30	Salvatore Di Maro	Drug design and development	Peptides as drugs: An old and new avenue for the treatment of human diseases
May	21	9.30-11.30	Claudia Angelini	Bioinformatics	Introduction to ChIPseq and ATAC-seq data Analysis
May	21	11.30-14.30	Annamaria Carissimo	Bioinformatics	Introduction to RNA-Seq data Analysis
May	28	9.30-11.30	Sandro De Falco	Molecular bases of Human diseases	Angiogenesis in health and diseases
May	28	11.30-13.30	Domenico Raimondo	Structural Biology and Protein Function	Empowering Life Science Exploration: Artificial Intelligence (AI) meets Protein Structure Bioinformatics
May	28	14.00-18.00	Domenico Raimondo	Bioinformatics	Practical Insights: Navigating Biomacromolecular Complexity with AI

Program

Month	Day	Time	Lecturer	*Section	topic
June	4	9.30-11.30	Sandro Cosconati	Bioinformatics	From Receptor- to Artificial Intelligence-Based Methods in Drug Discovery
June	4	11.30-13.30	Erica Salvati	Cancer Biology and Therapy	Telomere Targeting Approaches in Cancer: Beyond Length Maintenance
June	11	9.00-11.30	Andrea Petretto	Structural biology and protein function	Omics in Precison Medicine
June	11	11.30-13.30	Nicoletta Potenza	Cancer Biology and Therapy	Non-coding RNA in Cancer Biology
June	18	9.30-11.30	Sandro Banfi	Molecular bases of Human diseases	Non-coding RNAs in health and disease
June	18	11.30-13.30	Vincenzo Nigro	Molecular bases of Human diseases	Undiagnosed genetic diseases
June	25	9.30-11.30	Vincenza Colonna	Molecular bases of Human diseases	Pangenomics
June	25	11.30-13.30	Maria Matarazzo	Molecular bases of Human diseases	Epigenetic control of cellular identity and function in human disorders
July	2	9.30-11.30	Susan Costantini	Cancer Biology and Therapy	Metabolomics studies integrated with computational biology approaches for the research of novel cancer boimarkers and therapeutic strategies
July	2	11.30-13:30	Fernando Gianfrancesco	Cancer Biology and Therapy	Molecular and cellular mechanisms underlying skeletal tumours