

Introduction to Translational medicine: from benchside to bedside to the community

January 14-18, 2019

George Mason University, Dipartimento della Salute della Donna e del Bambino-Azienda Ospedaliera-Università di Padova, Istituto di Ricerca Pediatrica

Course Scientific Directors:

Lance A. Liotta, MD, PhD (George Mason University)

Raffaella Colombatti, MD, PhD (Azienda Ospedaliera-Università di Padova)

Contact (US): lliotta@gmu.edu, Office: 703-993-9444

Contact (Italy): Raffaella Colombatti

Local organizing committee (alfabetico):

Benedetta Accordi

Raffaella Colombatti

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LECTURES

Monday 9:00am-2:00pm (Department of Women's and Children's Health, Azienda Ospedaliera-Università di Padova)

Tuesday-Friday 9:00am-12:30pm (Pediatric Research Institute, City of Hope)

LABORATORY HANDS-ON-SESSION

Monday 1:15pm-4:45pm (Department of Women's and Children's Health)

Tuesday-Friday 2:00pm-5:30pm (Research Institute, City of Hope)

Lectures Faculty:

Adriana Albini, University of Milan, Milan, Italy

Gustavo Baldassarre, Centro di Riferimento Oncologico, Aviano, Italy

Pamela Ballotta, Azienda Ospedaliera-University of Padova, Padova, Italy

Alessandra Biffi, University of Padova, Padova, Italy, Dana Farber Cancer Institute, Boston USA

Silvio Bicciato, University of Modena and Reggio-Emilia, Modena, Italy

Gianni Bisogno, Azienda Ospedaliera-University of Padova, Padova, Italy

Barbara Buldini, Azienda Ospedaliera-University of Padova, Padova, Italy

Raffaella Colombatti, Azienda Ospedaliera-University of Padova, Padova, Italy

Lucia De Franceschi, Azienda Ospedaliera-University of Verona, Verona, Italy

Anita De Rossi, University of Padova, Padova, Italy

Gianluca Fincato, Novartis Pharmaceuticals, Italy

Carlo Giaquinto, University of Padova, Padova, Italy

Lance Liotta, George Mason University, Manassas, Virginia, USA

Alessandra Luchini, George Mason University, Manassas, Virginia, USA

Renzo Manara, University of Salerno, Salerno, Italy

Gabriella Pasciullo, BluebirdBio, Italy
Silvia Tusino, University of Padova, Padova, Italy
Giampietro Viola, University of Padova, Padova, Italy
Renato Zambello, Azienda Ospedaliera-University of Padova, Padova, Italy
Theoklis Zaoutis, Children's Hospital of Philadelphia, USA and Penta Foundation, Padova, Italy

Laboratory Hands-on workshops Faculty

Marco Agostini, University of Padova, Pediatric Research Institute, City of Hope
Benedetta Accordi, University of Padova, Pediatric Research Institute, City of Hope
Silvia Bresolin, University of Padova, Pediatric Research Institute, City of Hope
Giuseppe Germano, Pediatric Research Institute, City of Hope
Maddalena Paganin, Pediatric Research Institute, Padova, Italy

Course Description

Translational medicine is a discipline in biomedical research that aims to turn observations in the laboratory, clinic and community into interventions that improve the health of individuals and the public. The new era of personalized therapy and molecular medicine is also perfect example where the functional aspects of genomics, proteomics and bioinformatics can come together at the patient's bedside. This introductory course will introduce attendees to a key aspects of translational medicine in the field of oncology, hematology and infectious diseases and focus on the practical use of these three areas for the diagnosis, prevention and treatment of disease. Hands-on technical workshops will be used to illustrate and educate students, as well as touch on issues related to implementation of new platforms and assays.

The **laboratory workshops** will encourage scientific inquiry through the analysis of "unknown" specimens.

Course Goals

1. Exposure to recent concepts in translational research. Understand the role of translational research in clinical medicine.
2. Exposure to proteomic and genomic technologies used in translational research via small group training/analysis workshops. Application of technologies to solve research questions.
3. Ability to synthesize hypotheses and experimental plans for research projects.
4. Discuss real world examples of translational medicine projects in oncology, hematology and infectious disorders

Course materials: Lectures will be based upon information from review articles, primary literature, and *Molecular Profiling* (Methods in Molecular Biology series) edited by Virginia Espina/Lance Liotta. You do not need to purchase the book. Thumb drives containing the course materials and software will be provided. Students are encouraged to bring a laptop computer with Microsoft Excel for viewing the course material and preparing their final project.

Laboratory materials: Lab notebooks are required. The notebooks can be any style and are intended to be resources for the students for note taking, data recording, and data analysis. A laboratory manual will be provided.

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Course Itinerary

Monday January 14, 2019 Location: Azienda Ospedaliera-University of Padova 9:00am-5:30pm INNOVATIVE TOOLS FOR TRANSLATIONAL MOLECULAR RESEARCH	
9:00am-9:30am	Greetings from local Authorities
The Need for Personalized Molecular Medicine 9:30am-11:45am	
9:30am-10:00am	Lance Liotta (GMU) The upcoming revolution in translational medicine. Introduction to the course. Review of cancer medicine and the basics of cancer molecular biology and cancer metastasis Discussion of basic principles of molecular medicine, including the definition and the need for individualized diagnostics and therapeutics.
10:00am-10:30am	Giuseppe Basso: A success story: Childhood Leukemia
PLENARY LECTURE	
10:30-11:00	Coffee Break
11:00am-11:30am	Renato Zambello (University of Padova): Biological and clinical features of chronic lymphoproliferative disorders of granular lymphocytes
11:30am-12:00am	Barbara Buldini (University of Padova) Flow cytometry and the diagnosis of leukemia.
12:00PM-12:30PM	Adriana Albini (Milano): Angiogenesis and Tumor Microenvironment
12:30PM-13:00PM	Lunch
13:15pm-4:45pm	Laboratory Hand-on workshops

Tuesday January 15, 2019

Location: Institute of Pediatric Research (IRP)

9:30am-5:30pm

Morning Lectures**How translational research is revolutionizing cancer treatment****9:00AM-12:15PM**

9:30am-10:00am	Alessandra Luchini (Mason University): Protein protein interactions / Protein Painting
10:00am-10:30am	Giampietro Viola: Mechanisms for activating cell death in cancer cells: implication for therapeutic targeting
10:30am-10:45am	Coffee break
10:45am-11:15am	Gustavo Balzarre (Molecular Oncology Unit, CRO Aviano): Translational research in ovarian cancer: the MITO experience
11:15am-11:45am	Lance Liotta: Translational research in breast cancer
11:45am-12:15pm	Gianni Bisogno (Prof. of Pediatrics, University of Padova): Challenges in Pediatric Clinical Research
12:30pm-2:30pm	Lunch
2:30pm-5:30pm	Laboratory Hands-on workshop

Wednesday January 16, 2019

Location: Institute of Pediatric Research

9:30am-5:30pm

Morning Lectures**Translational research for dissection of host-pathogen interaction, infectious disease diagnostics and treatment.****9:00AM-12:15PM**

9:00am-9:30am	Theoklis Zaoutis (Children's Hospital of Philadelphia and PENTA Foundation): Antibiotic Resistance and Stewardship
9:30am-10:00am	Theoklis Zaoutis (Children's Hospital of Philadelphia and PENTA Foundation): Update on the Management of Infectious Diseases in Pediatric Oncology Patients
10:00am-10:45am	Alessandra Luchini (Mason University) – Raffaella Colombatti (Padova): Novel strategies for tuberculosis and neglected disease detection and diagnosis in developing countries
10:45am- 11:00am	Coffee break
11:00am-12:00am	Carlo Giaquinto- Anita de Rossi (University of Padova): Update on Translational medicine in HIV research and virology.
12:00am-12:30pm	Silvio Bicciato (University of Modena and Reggio Emilia): Bioinformatics and Data analysis
12:30pm-2:30pm	Lunch
2:30pm-5:30pm	Laboratory Hands-on workshop

Thursday January 17, 2019	
Location: Institute of Pediatric Research 9:30am-5:30pm	
Genetic hematologic disorders 9:00am-12:30pm	
9:00am-9:30am	Raffaella Colombatti (Azienda Ospedaliera-University of Padova): From clinical questions to the design of Clinical Trials in Sickle cell anemia: new therapeutic molecules in SCD
9:30am-10:00am	Lucia de Franceschi (University of Verona): Murine models of sickle cell anemia and hematologic disorders
10:00am-10:30am	Alessandra Biffi (Dana Farber, Boston Children Hospital and University of Padova): gene editing and gene therapy in genetic disorders
10:30am-10:45am	Coffee break
10:45am-11:15am	Renzo Manara (University of Salerno): Unraveling the brain: advanced imaging and "old" techniques in hematologic disorders
11:15am-11:45am	Patient perspective: Associazione Malattia Drepanocitica patient advocacy group
11:45am-12:15pm	Patient perspective: AIL (Associazione Italiana Leucemia) patient advocacy group
12:30pm-2:30pm	Lunch
2:30pm-5:30pm	Laboratory Hands-on workshops
Friday January 18, 2019	
Location: Institute of Pediatric Research 9:30am-5:30pm	
Pharma perspective Bioethics Patent and Intellectual property 9:00am-10:30am	
9:00am-9:30am	Silvia Tusino (University of Padova): The role of Ethics in Biomedical Research: past, present and future
9:30am-10:00am	Annachiara Frigo (University of Padova): The role of ethics committees in biomedical research
10:00am-10:30am	Pamela Ballotta (Azienda Ospedaliera di Padova): Patient care from the nurse perspective in the era of precision medicine
10:30am-10:45am	Coffee Break
10:45am-11:15am	Gabriella Pasciullo (Blue Bird Bio): From research to the community: the case of gene therapy development
11:15am-11:45am	Fincato Gianluca (Novartis Pharmaceuticals): Translational medicine: focus and approach from a big pharma
11:45am-12:15pm	Lance Liotta (Mason University): Intellectual property
12:15-12:30	Concluding remarks -Delivery of certificates
12:30pm-2:00pm	Lunch
2:00pm-6:00pm	Hands-on workshops + Final Essay Preparation

Laboratory Hands on Workshops

Students will participate in hands-on workshop in the afternoons from Monday January 14, 2019 to Friday January 18, 2019.

Monday Workshops

1. Flow cytometry and cytogenetics (Dr. Barbara Buldini and Renato Zambello)

Tuesday Workshops

1. Reverse-Phase Protein Arrays (Dr. Benedetta Accordi/ Dr. Valentina Serafin)
2. Mass Spectrometry (Dr. Marco Agostini/ Dr. Sara Crotti)

Wednesday Workshops

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Thursday Workshops

1. Zebrafish and disease modeling(Dr. Giuseppe Germano)
2. Next Gen sequencing (Dr. Silvia Bresolin/ Dr. Maddalena Paganin)

Friday Workshops

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ADDITIONAL

3. Nanoparticle Rapid Test for Infectious disease (Dr. Alessandra Luchini)

Student Groups:

Group A (1-20); Group B (21-40);

Workshops	Monday 2:30pm-5:30pm
Flow cytometry and cytogenetics, adult leukemia	A
Flow cytometry and cytogenetics, pediatric leukemia	B

Workshops	Tuesday	Wednesday	Thursday	Friday
Reverse Phase Protein Array	A	B		
Nanoparticles / Mass Spectrometry	B	A		
Zebrafish			A	B
Next gen sequencing			B	A

Student Papers due Monday January 20, 2019