TEACHING MODULE Announcement

PhD in Information and Communication Technology for Health

Università degli Studi di Napoli Federico II

Module Title: Immunology: from basic principles to mathematical modeling

Lecturer 1: Angela Alberico

CNR, Istituto per le Applicazione del Calcolo (IAC) "M. Picone", Napoli
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CV: She received the Dr. degree (summa cum laude) in Mathematics from University of Napoli Federico II, Italy, in 1993, and the Ph.D. degree in Mathematics from the University of Napoli Federico II, in 1998. Since December 2001, she has served as a Researcher with the Istituto per le Applicazioni del Calcolo "Mauro Picone" (IAC), CNR, Napoli. She received the national scientific habilitation as Associate Professor of Analysis, Probability, and Mathematical Statistics in 2018. Her research activity includes regularity properties of solutions to elliptic PDEs, eigenvalue problems, symmetrizations and rearrangements, isotropic and anisotropic variational problems, Sobolev type inequalities, anisotropic functions spaces, and functional inequalities. She has been serving as a Reviewer for several international journals.

Lecturer 2: Veronica De Rosa

CNR, Istituto per l'Endocrinologia e l'Oncologica Sperimentale (IEOS) c/o Centro Interdipartimentale di Ricerca in Scienze Immunologiche di Base e Cliniche (CISI) Università degli Studi di Napoli Federico II, Napoli
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CV: Dr. De Rosa graduated in Biotechnology with highest honors, in 2002 at the University Federico II of Naples. In 2004, Dr. De Rosa won a research doctorate in Molecular Endocrinology and Oncology at the University of Naples Federico II. From 2016 she has a permanent position of Researcher at the Institute for Endocrinology and Experimental Oncology of the National Research Council (IEOS-CNR). Her research activity is mainly focused on the alteration of T cell tolerance and the control of Treg cell function in autoimmunity. She received multiple awards (4th PBI International Prize in 2006, Harlan Prize for Immunology in 2007, Rotary club Prize for young Researcher in 2015, "Rita Levi Montalcini" Prize in 2018).

Lecturer 3: Francesco Verde

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CV: He received the Dr. Eng. degree (summa cum laude) in electronic engineering from the Second University of Napoli, Italy, in 1998, and the Ph.D. degree in information engineering from the University of Napoli Federico II, in 2002. Since December 2011, he has served as an Associate Professor of telecommunications with the Department of Electrical Engineering and Information Technology, University of Napoli Federico II. His research activity lies in the broad area of signal processing for wireless communications. He has been serving as an Associate Editor for the IEEE TRANSACTIONS ON COMMUNICATIONS since 2017 and a Senior Area Editor for the IEEE SIGNAL PROCESSING LETTERS since 2018. He is an IEEE Senior Member.

Dates and Locations (This is a distance on-line learning course)

Date	Hours	Room	Lecturer
09 novembre 2020	9:30-12:30	MS Teams	Veronica De Rosa
13 novembre 2020	9:30-12:30	MS Teams	Veronica De Rosa
16 novembre 2020	9:30-11:30	MS Teams	Francesco Verde
20 novembre 2020	9:30-11:30	MS Teams	Angela Alberico
23 novembre 2020	9:30-11:30	MS Teams	Angela Alberico
27 novembre 2020	9:30-12:30	MS Teams	Francesco Verde

Content

I Lesson: The immune system: the innate and adaptive response. T cell activation. T cell differentiation, clonal expansion and maturation.

II Lesson: T lymphocyte fate and plasticity. Impact on activation, differentiation and regulation of the immune response. Relationships with autoimmunity.

III lesson: Role of mathematical models in immunology. Molecular-level, cellular-scale, and tissue-scale immune dynamics.

IV Lesson: Models based on ordinary differential equations (ODEs) in immunology.

V Lesson: Models based on partial differential equations (PDEs) in immunology.

VI Lesson: Models based on information theory in immunology. Cell signalling and uncertainty into kinetics of T cell receptor (TCR) binding.

ECTS Credits: 3

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