



University of Cyprus
Department of Biological
Sciences

Postgraduate Seminars

Seminar Series 2018 - 2019

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The Institute of Genetics and Molecular Medicine
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““Regulating the Regulators: The curious case of protein citrullination”

**Wednesday, 10 April 2019, at 17:00
Building CTF 01, Room 110, Panepistimioupoli Campus**

This seminar is open to the public

We aim to understand how extracellular signals (e.g. developmental cues or cellular stresses) are transduced to the cell nucleus to modulate gene expression and epigenetic state, ultimately determining cellular responses and cell identity. Within this broad goal, our work focusses mainly on the protein post-translational modification (PTM) citrullination and the enzymes that catalyse it, the peptidylarginine deiminases (PADIs). The nuclear deiminase PADI4 is a well-established regulator of transcription and chromatin compaction. It is activated during the innate immune response to infection, whereby it leads to profound chromatin decondensation, mediating the formation of neutrophil extracellular traps. Our work has shown that PADI4 is also activated in stem cells during the transition to naïve pluripotency and in the pre-implantation embryo. Notably, PADI4 deregulation, typically in the form of over-active citrullination, is strongly implicated in the aetiology of a host of pathologies including autoimmunity, neurodegeneration and late stage cancer. This has created impetus to understand how PADI4 is regulated at the biochemical, cellular and organismal level. I will present our recent findings of the signalling pathways that lead to PADI4 activation in pluripotent cells and the role of PADI4 in tissue and cancer stem cells. In addition, I will tell the extraordinary story of PADI enzyme evolution and speak about its implications for citrullination biology in mammals.