

Expositor: Luis Zapata, Institute of Cancer Research, London.

Título: Immune selection determines mutational landscape of cancer and predict response to immunotherapies.

Abstract:

Natural selection forces govern somatic cell evolution. One of these forces is the immune system that, besides protecting us from viruses and bacteria, recognises our own faulty somatic cells and ultimately shapes the emergence of tumors during a process called immunoediting. However, to what extent genetic variation in cancer undergoes immunoediting, and what are the determinants that predispose somatic cells to become malignant remain poorly understood. By exploiting 10K genomic datasets from 33 tumor types, we have uncovered the extent of natural selection in the cancer genome and demonstrated how immunoediting shapes the emergence of antigen-free and antigen-rich tumors.

In this talk, I will uncover cancer drivers and essential genes using evolutionary theory and mathematical modelling, demonstrate the impact of the immune system on the cancer genome, and how molecular signatures can provide us with better stratification strategies to improve patient outcomes. Overall, my research demonstrates the critical role of natural selection in cancer evolution and highlights the potential of evolutionary theory to uncover important insights into cancer biology and treatment.

Bio:

Dr. Luis Zapata is currently a Team Leader at the Institute of Cancer Research, London. His research focuses on understanding the role of the immune system in healthy and malignant tissues using genomic technologies, evolutionary theory, mathematical modelling and clinical data. After finishing his PhD in Biomedicine as La Caixa Fellow under the supervision of Dr. Stephan Ossowski at the CRG in Barcelona, and worked with Prof. Andrea Sottoriva as a Marie Curie-Sklodowska Postdoctoral Fellow at the Institute of Cancer Research (ICR) in London, he continued at the ICR first as an ICR fellow, and recently as a Team Leader. His work spans several topics including plant, viral and bacterial genomics, cancer evolution, and more recently immunology. He enjoys football, tennis, swimming and poker.

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