Virtual BSC RS/Life Session: Single-cell cancer phylogenomics

Objectives

Title: Single-cell cancer phylogenomics

Abstract: A tumor consists of an expanding population of clonal cells that differentiate to a bigger or lesser extent and disperse to nearby or distant tissues. We have leveraged state-of-the-art approaches from statistical phylogenetics, phylodynamics, and phylogeography to exploit the information contained in single-cell whole genomes from multiregional tumor samples to understand this evolutionary process. This talk will present our current progress in obtaining, processing, and analyzing single-cell NGS data from colorectal tumors. I will show how proper methods from organismal evolutionary biology can be ported to the somatic level to decipher complex tumoral dynamics over time and space with unprecedented detail.



Short Bio:

David Posada (Vigo, 1971) obtained a Ph.D. in Zoology from Brigham Young University (USA) in 2001. After a postdoc in a pharmacogenomics company (Variagenics) and MIT, he returned to the University of Vigo as a Ramon y Cajal fellow in 2003, where he is a Professor of Genetics since 2010. His lab is focused on theoretical, methodological, and empirical aspects of the evolutionary analysis of genes and genomes. His research has been essentially cross-disciplinary, combining concepts and tools from biology, statistics, and computer science. He has worked mainly on the selection of DNA substitution models, detection of recombination, coalescent models, phylogeography, and estimation of species phylogenies from genomic data. More recently, he has initiated a new research avenue in the field of cancer evolution, focusing on understanding the complex dynamics of tumor cell populations over time and space using single-cell genomic data produced in his lab, and analytical methods adapted from organismal evolutionary biology. His work has been cited more than 67,000 times, and one of his articles is among the 100 most cited in the history of science. He has obtained two grants (StG 2008 and CoG 2014) from the European Research Council.

Speakers

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