

Arcadi Navarro
ICREA / U. Edinburgh (on sabbatical)

“Why do we age? Contradictory effects of disease-causing variants in early and old age”

Friday 30th November 2018, 1pm
Levinsky Room, ICH

Abstract

"Senescence, the process of organismic decay with ageing, is a public health challenge and a fascinating evolutionary problem. We tested the two most well-known evolutionary explanations of senescence, mutation accumulation and antagonistic pleiotropy, which postulate that genetic variants with harmful effects in old ages can be tolerated by natural selection, or even favored by it at early ages. We studied the effects of genetic variants associated with diseases appearing at different periods in life, when they are expected to have different impacts on fitness and observed that data fit theoretical expectations. Namely, we observe higher risk allele frequencies combined with large effect sizes for late-onset diseases; we also detect a significant excess of early-late antagonistically pleiotropic variants which, strikingly, tend to be harbored by ageing-related genes. This latter result led us to study the comparative genomics of ageing in primates and mammal, looking for potential amino-acid changes and modifications in rates of protein evolution that might parallel extensions or shortenings of animal longevities. We do find some relevant changes that, interestingly, could not have been accessed by typical association studies, since they are fixed in our species"

Biosketch

Arcadi Navarro obtained his PhD from the Universitat Autònoma de Barcelona. After quitting the academic world for a few years, he went back to basic research in 1999 as a postdoctoral fellow at the University of Edinburgh. He was appointed ICREA Research Professor at the UPF in 2006 and Professor of Genetics in 2010. Since 2002 he has led a group researching on Evolutionary Genomics, an area in which he has over 150 publications, within the Evolutionary Biology Unit of the Department of Experimental and Health Sciences of the UPF. Between 2013 and 2016, he was the director of that Department. Additionally, he was the director of the Population Genomics Node of the Spanish National Institute for Bioinformatics (INB) and joined the CRG (Center for Genomic Regulation) to take co-responsibility of the European Genome-phenome Archive (EGA, see <https://ega-archive.org>) in the context of a collaboration with the EMBL-EBI (European Bioinformatics Institute).

In January 2016 he quitted all these responsibilities to start a second period out of academia, this time as a member of the Catalan Government. He served as Secretary for Universities and Research until July 2018. They were two and half intense years, but now he is back to his previous positions as a scientist.