Department of Biochemistry and Molecular Biology

2018 Seminar Series

Wednesday 18th of April
12-1pm
Bio21 Institute Auditorium
30 Flemington Road, Parkville

Dr Sebastián Duchêne

Department of Biochemistry, University of Melbourne

Uncovering pathogen epidemiological dynamics using evolutionary methods

Sebastian joined the University of Melbourne as a McKenzie fellow in mid 2016. He obtained his PhD in 2015 at the University of Sydney, supervised by Prof Simon Ho. His thesis investigated the factors that govern evolutionary rates in viruses and it developed bioinformatics approaches for evolutionary analyses of viral genomes. After his PhD, Sebastian was a postdoctoral fellow with Prof Edward Holmes at the Charles Perkins Centre in the University of Sydney. In this role, he studied the time of origin of Dengue and Yellow Fever, and he developed statistical approaches to improve estimates of the time of origin of viruses. He is currently based in the Holt research group in the Bio21 institute. His current research consists in developing phylogenetic methods to harness the potential of bacterial genome surveillance. Sebastian runs an annual phylogenetics workshop at the University open to all students and staff members.

Microbial pathogens evolve orders of magnitude faster than their multicellular hosts, such that their evolutionary and epidemiological processes occur at a similar timescale. Phylogenetic methods can take advange of pathogen genomic information to the time and location of origin of these organisms. More recently, sequencing technologies have dramatically increased the speed with which pathogen genome data can be obtained, which has prompted epidemiological investigations using phylogenetic methods, a field known as ‘phylodynamics’. This talk will discuss some recent advances in phylogenetic and phylodynamic methods for microbial pathogens. It will present two key examples of studies that investigated the ‘deep’ evolutionary origin of Neanderthal microbiota and of giant viruses. Then it will illustrate the potential of phylodynamics in the recent Ebola virus West African epidemic and the global 2009 H1N1 flu pandemic.

ALL WELCOME. Please join us for a light lunch after the seminar!
Further information: Matthew Dixon (matthew.dixon@unimelb.edu.au)