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## CBA and RSB Director's seminar series: Developing Darwin's Computer

Tuesday 16 July 2013 1 – 2pm

**Alexei Drummond** Professor of Computational Biology, Allan Wilson Centre of Molecular Ecology and Evolution, Department of Computer Science, University of Auckland, [Co-founder and Director of Biomatters Ltd]

**Robertson Lecture Theatre**, R.N. Robertson Building (no. 46), Research School of Biology ANU.

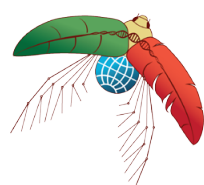


What would Darwin want his computer to do if he were alive today? Evolution has long been an essential tool in understanding biology, but two things are very different about the biological sciences of the 21st century: vast amounts of computational power and vast amounts of data. Technology has a knack of changing the way we do science.

In this talk I will outline some recent forays into evolutionary biology, phylogenetics, infectious disease modeling and ecosystem biology from the perspective of a computational biologist. My research has focused on developing computer software to understand the increasingly large volumes of molecular sequence data from an evolutionary perspective. I will describe four main areas:

- (1) molecular epidemiology for tracking the sources and dynamics of rapidly evolving pathogens such as HIV and Influenza,
- (2) ancestral reconstruction of prehistoric populations,
- (3) molecular ecology and the interface between population genetics and phylogenetics and
- (4) next-generation environmental ecology.

All these areas are threaded together by a need for sound statistical computing approaches that take into account the evolutionary underpinnings of the problem.



Centre for  
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