Introductory human genome bioinformatics workshop

Thursday 28th - Friday 29th January 2016

UNSW THE UNIVERSITY OF NEW SOUTH WALES

LOWY CANCER RESEARCH CENTRE

tcrn bridging the gap translational cancer research network

Prince of Wales Clinical School

Overview

The aim of this workshop is to introduce established and emerging bioinformatics resources to researchers studying the human genome. The workshop is specifically designed for biomedical scientists who are interested to make use and take advantage of vast resources of genomics data that is current available in the public domain. Furthermore, the workshop will cover some basic practical bioinformatics skills that will enable preliminary inspection of public datasets. The objective of the workshop is for attendees to leave with knowledge of how to begin to use publicly available bioinformatics resources for their own research.

The workshop is organised by Dr Jason Wong, head of the Bioinformatics and Integrative Genomics group at the Prince of Wales Clinical School, UNSW. This year we will have Dr Joshua Ho, author of one of the major ENCODE papers in Nature (Ho et al. (2014) Nature 512:449-452) to run a workshop on accessing ENCODE data.

Participation in this workshop is free, but registration is essential. To register, please visit (https://powcs.med.unsw.edu.au/bioinformatics_workshop). Note that there is a limited of 30 places for the workshop.

Programme

The workshop will run over 2 days and will be divided into 4 independent sessions. The first day will be focused on basic techniques used to visualise and work with genomics data using genome browsers and Galaxy. On the second day the focus will be on gene annotation and accessing different publicly available human genomics resources.

To get the most of the workshop, attendance of all sessions is encouraged, but registrants must indicate the sessions they will attend upon registration.

All sessions will be run in computing labs G08 in the Wallace Wurth using free and browser-based software.

Location

All sessions of the workshop will be held on in the computing lab G08 on the ground floor of the Wallace Wurth Building (cnr High and Botany St) at the University of New South Wales.

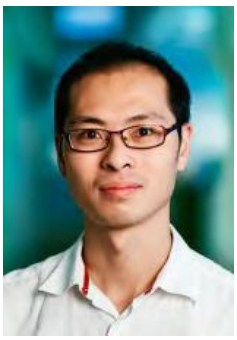
Programme

Location: G08 Wallace Wurth Building, University of New South Wales

Time	Topic	Instructor
Day 1 – Thursday 28th Jan 2016 **Session 1:** Browsing the human genome		
9:30 am – 9:45 am	Welcome and introduction to the workshop	Jason Wong
9:45 am – 10:45 am	Introduction to the UCSC genome browser and Integrative Genomics Viewer.	Dominik Beck
10:45 am – 11:00 am	Tea break	
11:00 am – 12:30 am	Workshop: Visualising and downloading data using genome browsers.	Dominik Beck
12:30 pm – 1:30 pm	Lunch	
Session 2: Working with genomics data		
1:30 pm – 2:00 pm	Introduction to genomics data types.	Jason Wong
2:00 pm – 3:00 pm	Working with large files, genomic algebra and Galaxy	Jason Wong
3:00 pm – 3:15 pm	Tea break	
3:15 pm – 4:30 pm	Workshop: Exercises using Galaxy	Jason Wong

Day 2 – Friday 29th Jan 2016 **Session 3:** Gene variation and annotation (including ENCODE data)		
9:30 am – 10:00 am	Introduction to the 1000 genomes project and COSMIC.	Jason Wong
10:00 am – 11:00 am	Workshop: Using 1000 genomes project and COSMIC to annotate a gene of interest.	Jason Wong
11:00 am – 11:15 am	Tea break	
11:15 am – 11:45 am	Introduction to the ENCODE project and the Human Epigenome Atlas	Joshua Ho
11:45 am – 12:30 pm	Workshop: Using ENCODE to annotate a gene of interest.	Joshua Ho
12:30 pm – 1:30 pm	Lunch	
Session 4: Cancer genomics and data integration		
1:30 pm – 2:00 pm	TCGA and ICGC datasets and other genomics data repositories.	Rebecca Poulos
2:00 pm – 2:45 pm	Workshop: Accessing and interrogating TCGA/ICGC data.	Rebecca Poulos
2:45 pm – 3:00 pm	Tea break	
3:00 pm – 4:30 pm	Workshop: Putting it all together – integration of genomic datasets.	Jason Wong

Instructors



Dr Jason Wong heads the Bioinformatics and Integrative Genomics group at the Lowy Cancer Research Centre and is an ARC Future Fellow and Senior Lecturer at the Prince of Wales Clinical School, UNSW. He obtained his D.Phil from the University of Oxford in 2007 in the fields of biophysical chemistry and bioinformatics.
His current research is focused on the application of bioinformatics, genomics and proteomics to study mutation processes and gene regulation in cancer.

Dr Dominik Beck is a NHMRC Peter Doherty Post-doctoral fellow and a Senior Lecturer in the School of Software and a core member of the Centre for Health Technologies at the University of Technology Sydney. He obtained his PhD in Bioinformatics from ADFA, UNSW in 2010 and completed his post-doctoral training in the Stem Cell Group at the Lowy Cancer Research Centre, UNSW. His current research interests are in the areas of haematopoietic malignancies, non-coding RNA, gene regulatory networks and bioinformatics.

Dr Joshua Ho completed a BSc (Hon 1, Medal) in Biochemistry and Computer Science in 2006 and a PhD in Bioinformatics in 2010, both from the University of Sydney. He then completed an interdisciplinary postdoctoral fellowship at the Harvard Medical School (HMS), and was promoted to an Instructor in Medicine in 2012. In 2013, he returned to Australia to set up the Bioinformatics and Systems Medicine Laboratory at the Victor Chang Cardiac Research Institute. He is also a conjoint senior lecturer at UNSW. His research focuses on developing fast and reliable bioinformatics methods to identify the genetic cause of inherited heart diseases.

Ms Rebecca Poulos completed a BSc in Biotechnology and BBus in Accounting at the University of Technology Sydney in 2013 and a BSc (Hon 1, Medal) in Medical Science in 2014 at UNSW. She is currently a second year PhD student in the Bioinformatics and Integrative Genomics Group at the Lowy Cancer Research Centre. Her PhD project is focused on the identification of cis-regulatory mutation and mutational processes that govern the formation of these mutations in cancer.