



# Sydney Summer School in Pathogen Genomics and Global Health Program

## Program

**12-16 February 2018**

Venue: Nanoscience Hub, The University of Sydney (Camperdown Campus)

### Monday, 12 February 2018

**10.00-13.00** Registration – (Seminar Room 1.1)

**13.00-13.30** Welcome and introduction to the course

#### Module One Introduction to microbial genomics

**13.30-15.00** Masterclass 1: Microbial genomes and genome sequencing  
*Dr Rebecca Rockett and Dr Verlaine Timms (CIDM-PH, MBI, University of Sydney)*

**15.00-15.15** Afternoon Tea

**15.15-16.00** Informatics Review 1: CLC Genomics Workbench  
*Dr Rebecca Rockett, Dr Elena Martinez (CIDM-PH, MBI, University of Sydney)*

**16.00-17.30** Exercise 1: Identification of the taxonomic position of viruses and bacteria from genomic data  
*Dr Rebecca Rockett (CIDM-PH, MBI, University of Sydney)*

### Tuesday, 13 February 2018

#### Module Two Genomics and evolution of drug resistance

**9.00-10.00** Masterclass 2: Prediction of drug resistance and its clinical relevance  
*Dr Grant Hill-Cawthorne (MBI, School of Public Health, University of Sydney)*

**10.00-11.00** Masterclass 3: Plasmid-mediated antibiotic resistance and emerging clones of drug resistant bacteria  
*Dr Sally Partridge (WIMR, University of Sydney)*

**11.00-11.30** Morning coffee

**11.30-12.30** Informatics Review 2: ABC of high performance computing  
*Dr Ranjeeta Menon (CIDM-PH, MBI, University of Sydney)*

**12.30-13.30** Lunch

**13.30-15.30** Exercise 2: Inference of drug resistance in bacterial resistance  
*Dr Elena Martinez (CIDM-PH, MBI, University of Sydney)*

**15.00-15.30** Afternoon Tea

**15.30-17.00** Exercise 3: Transcriptional profiling  
*Dr Elena Martinez (CIDM-PH, MBI, University of Sydney)*

**18.30** Course Dinner and Guest Lecture: “Public health applications of bacterial genomics” *Professor Ben Marais (MBI, University of Sydney and Children’s Hospital Westmead)*



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## Wednesday, 14 February 2018

### Module Three Genomics-guided public health surveillance

9.00-11.00	Masterclass 4: Phylogenomics of emerging pathogens <i>Prof Eddie Holmes (Sydney Medical School/Faculty of Science, University of Sydney)</i>
11.00-11.30	Morning Coffee
11.30-12.30	Masterclass 5: International, national and regional surveillance networks <i>Dr Matthew O'Sullivan (NSW Health Pathology, Westmead Hospital, University of Sydney)</i>
12.30-13.30	Lunch
13.30-14.30	Informatics Review 3: Visualisation of multi-dimensional clinical and genomics data <i>Dr Rosie Sadsad (Sydney Informatics Hub, CIDM-PH, MBI, University of Sydney)</i>
14.30-15.30	Exercise 4: Deciphering transmission pathways (Galaxy example) <i>Dr Rosie Sadsad (Sydney Informatics Hub, CIDM-PH, MBI, University of Sydney)</i>
15.30-16.00	Afternoon Tea
16.00-17.00	Exercise 5: Detection of point source outbreaks <i>Dr Qinning Wang (CIDM-PH, Pathology West)</i>

## Thursday, 15 February 2018

### Module Four Genomic data in clinical and public health context

9.00-9.45	Masterclass 6: Integration of genomic, clinical and epidemiological data <i>A/Prof Vitali Sintchenko (CIDM-PH, MBI, University of Sydney)</i>
9.45-10.30	Masterclass 7: Evolution of genomes under vaccine pressure <i>Prof Ruiting Lan (University of New South Wales)</i>
10.30-11.00	Morning Coffee
11.00-12.00	Informatics Review 4: Analysis of core and accessory genomes <i>Dr Verlaine Timms (CIDM-PH, MBI, University of Sydney)</i>
12.00-13.00	Exercise 6: Genome mapping, assembly and characterisations (in small groups) <i>Dr Verlaine Timms and Dr Rajat Dhakal (CIDM-PH, MBI, University of Sydney)</i>
13.00-14.00	Lunch
14.00-15.00	Transfer to Westmead
15.00-17.00	<b>Visit to NSW Public Health Pathogen Genomics Unit at the Centre for Infectious Diseases and Microbiology, NSW Health Pathology and Westmead Hospital</b> Station 1: DNA Extraction and Quantification, Station 2: Library Preparation, Station 3: Sequencing, Station 4: FastQ files' handling and Quality Control procedures , Station 5: Synthesis with epidemiological data



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## Friday, 16 February 2018

### Module Five      Metagenomics and culture-independent sequencing

<b>9.00-10.00</b>	Masterclass 8: Metagenomics <i>Dr Rohan Williams (National University of Singapore)</i>
<b>10.00-11.00</b>	Exercise 7: Analysis of culture-independent metagenomic data <i>Dr Rebecca Rockett (CIDM-PH, MBI, University of Sydney)</i>
<b>11.00-11.30</b>	Morning coffee
<b>11.30-12.00</b>	Informatics Review 5: Genomic data analysis using R <i>Dr Alex Outhred (Children's Hospital Westmead and University of Sydney)</i>
<b>12.00-13.00</b>	Informatics Review 6: Genome-wide association studies <i>Dr Ranjeeta Menon (CIDM-PH, MBI, University of Sydney)</i>
<b>13.00-13.45</b>	Lunch
<b>13.45-16.00</b>	Presentations from participants (Exercise 6 cont.)
<b>16.00-16.30</b>	Closing remarks and evaluation