SANBio BIOINFORMATICS TRAINING COURSE
23-27 OCTOBER 2017
UNIVERSITY OF CAPE TOWN
SOUTH AFRICA

"THE MICROBIOME: ANALYSIS OF NGS DATA FOR SPECIES IDENTIFICATION"

SUMMARY

Microbiome relates to the complexity of microbial species that co-exist in the same habitat. The isolation and characterization of organisms in such samples are quite challenging with conventional techniques. However, they can be analysed through sequencing of DNA extracts from different sources such as soil, water or biological specimens like fecal matter, blood, body fluids or tissues. The DNA is randomly sequenced, meaning that fragments from multiple genomes are in the same mix. Thus the data has to be processed using bioinformatics applications that will assemble corresponding fragments for meaningful interpretation.

Species can be identified based on the sequences of 16S ribosomal genes. NGS (Next Generation Sequencing) results in large collections of sequences that have to be processed for interpretation. This course will teach participants how to use those applications for species identification based on the 16S rRNA sequences. The topics that will be covered are:

- Study design: 16S versus whole-genome versus
- The human microbiome – overview of bacteria, fungi, and viruses
- Taxonomic approaches: OTUs, alpha, beta diversity, UniFracg
- 16S Workflow
- Introduction to QIIME
- Uparse and Phyloseq
- Overview of shotgun sequence analysis
- Assembly of metagenomic data
- Functional annotation and gene prediction
- Microbiome tools and databases

TARGET PARTICIPANTS

This course is targeted to students and researchers who are working in microbial genomics and bioinformatics. Ability to work with Linux will be an advantage (for those with no experience in Linux, online materials will be recommended before the course). Datasets will be provided for processing, but please bring your own datasets to work through on the final day if available.

Application

Applicants should fill in the form at: https://is.gd/SANBioMicrobiome2017 and submit by 15 September 2017. Selected applicants will be notified by the end of September 2017.

Travel Fellowships

Up to 10 travel fellowships are available for successful applicants from the SANBio region. These can be applied for in the course application form. Selected participants can also apply for mobility grants from SANBio: http://www.nepadsanbio.org/opportunities-funding/funding/mobility-grants