



ARC-BTP: BIOINFORMATICS AND STATISTICAL GENOMICS TRAINING PROGRAM

Venue: Bioinformatics Training Laboratory, ARC-Biotechnology Platform Building (Building 38), ARC's Onderstepoort Campus, 100 Old Soutpan Road, Onderstepoort

**Bioinformatics module training for 2026/2027 will be request-based.
For registration and payment details contact:**

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Target audience

- Postgraduate students (Animal Science/ Plant Science/Genetics/Bioinformatics/Microbiology/etc.)
- Private and Government
- Scientists/Researchers

Prerequisite Knowledge/skills

- Intermediate level of computer knowledge and experience
- Using Linux systems and basic knowledge of R (module dependent)

General module information

- Modules are between 4 and 5 days in length
- All modules will run from 09h00 - 16h00 everyday
- Lunches are included
- Maximum 12 participants per training module
- Costs are R5 300.00 for a 4-day training and R6 500 for 5-day training.
- Modules 3 and 4 can be tailored made and packaged into one, depending on the request and target audience

MODULE CONTENT, SCHEDULE, AND COST IMPLICATIONS

Module	DURATION	Module Content
1 16s rRNA Metabarcoding Analysis Unit price per person (15% VAT included): R5 300.00	4 Days	<p>The 16s rRNA gene is currently a standard prokaryote marker and in combination with high-throughput sequencing technologies provide a method to analyse the structure and composition of microbial communities. This workshop is designed to provide participants with the necessary background and practical experience to successfully analyse and understand the 16s rRNA metabarcoding workflow. This workshop will cover the Qiime 2 and DADA2 workflows. Participants will have an opportunity for hands on data analysis with the assistance of the facilitators and tutors.</p>
2 Bacterial Whole Genome Sequencing (WGS) Analysis Unit price per person (15% VAT included): R5 300.00	4 Days	<p>Whole genome sequencing (WGS) is a critical tool in the agricultural, production and medical sector and currently provides the highest resolution with regards to bacterial profiling. This workshop is designed to provide participants with the necessary background and practical experience to successfully analyse and understand the bacterial whole genome sequencing workflow. This workshop will cover: (i) Wet-lab and library preparation background; (ii) Sequence quality control, whole genome assembly, annotation and assembly quality control (iii) Species identification and screening of other traits of interest, e. g. typing, antimicrobial resistance and virulence factors. Participants will have an opportunity for hands on data analysis with the assistance of the facilitators and tutors.</p>
3 Genome-wide SNP Data Analysis - Basic Population Genetic Analysis. Unit price per person (15% VAT included): R6 500.00	5 Days	<p>Genome-wide SNP genotyping arrays provide a useful genetic tool to explore the genomics variations in a wide variety of organisms including animal and plant species. They are one of the commonly used resources for population studies and genome mapping. This course will introduce data analysis tools for whole genome SNP genotyping array. The focus is on quality control and basic population/diversity analysis. Participants will learn</p>

			to use open-source software, R packages and web-based software for data analysis. Participants will have an opportunity for hands on data analysis with the assistance of the facilitators and tutors.
4	Genome-Wide Association Studies (GWAS) Unit price per person (15% VAT included): R6 500.00	5 Days	Rapid advance of sequencing and genotyping technology resulting in a wealth of new, high-quality data that may hold promise for the further elucidation of genetic factors underlying complex traits. A genome-wide association study (GWAS) is an approach used in genetics research to associate specific genetic variations with a specific trait. The course will be delivered over 4 days and participants will have an opportunity for hands on data analysis with the assistance of facilitators and tutors. In this hands-on session we will align example data from an GWAS experiment against the genome, variation calling, statistical GWAS analysis, interpret and visualize the results, as well as perform basic post-GWAS analyses for identifying candidate genes.
5	RNA-Seq Data Analysis (Transcriptomics) Unit price per person (15% VAT included): R6 500.00	5 Days	RNA-Seq is a next-generation sequencing method used for identifying genes and pathways underlying diseases or physiological conditions. This workshop introduces bulk RNA-seq data analysis, with a particular emphasis on differential expression analysis and will cover: (i) Workflow for a modern RNA-seq experiment (ii) Sample preparation considerations for RNA-seq experiments (iii) Process raw NGS data in FASTQ format to generate a gene expression matrix; (iii) Differential Expression analysis and (iii) Functional annotation. Participants will have an opportunity for hands on data analysis with the assistance of the facilitators and tutors.
6	Shotgun Metagenomics Unit price per person (15% VAT included): R5 300.00	4 Days	Shotgun metagenomic sequencing is a powerful alternative to 16S rRNA sequencing for analysing complex microbiome communities, or the virome. This workshop is designed to provide participants with the necessary background and practical experience to successfully analyse and understand the shotgun metagenomics workflow. This workshop will cover: (i) Sequence quality control and shotgun metagenomics assembly; (ii) Binning and (iii) Annotation. Participants will have an opportunity for hands on data analysis with the assistance of the facilitators and tutors

<p>Long Read Sequencing Analysis</p>		<p>Long read sequencing technologies such as Oxford Nanopore and Pacific BioSciences generate extended sequence reads that improve the resolution of complex genomic regions and genome assemblies. This workshop provides participants with the necessary background and practical experience to analyse long read sequencing data. This workshop will cover: (i) Principles of long read sequencing technologies; (ii) Sequence quality control and error correction; (iii) Genome assembly and polishing and; (iv) Structural variant detection and annotation. Participants will have an opportunity for hands on data analysis with the assistance of the facilitators and tutors.</p>
<p>7 Unit price per person (15% VAT included): R5 300.00</p>	<p>4 Days</p>	