

Foundations for Genomics



What: 2 Week Laboratory ready journey.

When: 5-16 February 2018

Cost: R15 000/participant

Workshop Program

- **Day 1**

Lecture: Quality management and introduction to CPGR

Brief CPGR tour

Lecture: DNA extraction protocols, quality assessment and PCR

Discussion of case study; how to use on-line databases to obtain information

Exercise: Prepare DNA extraction SOP

Lecture: Review SOPs

Carry out buffer calculations, in preparation for Day 2

- **Day 2**

Lab: Prepare buffers and consumables for DNA extraction

Lab: Prepare and catalog samples for DNA extraction

Lab: Carry out DNA extractions

Lab: DNA extractions continued

Record any deviations from SOP

- **Day 3**

Lab: Prepare DNA gels, qubit and nanodrop

Lab: Load and run gels; storage of samples

Lecture: Review results, discuss trouble shooting

Lab: repeat/re-run any QC if necessary

Record DNA extraction results Lecture

- **Day 4**

PCR Primer design and quality analysis

Lab: Design own primers

Lecture: Setting up a PCR reaction, including calculations

Lab: PCR mastermix calculations

Lab: Set up PCR; run overnight

Record any deviations from SOP

- **Day 5**

Lab: Prepare gel

Review own prime designs

Load and run PCR gel

Lecture: Review results; discuss trouble shooting

Exercise: Write Week 1 report

Complete report, for submission on Monday morning at 8:30am

- **Day 6:**

Lecture: Types of qPCR

Lecture: qPCR experimental design

Exercise: Design a qPCR project based on case study

Exercise: Analysis of qPCR data and trouble shooting

Round table discussion: MIQE requirements

- **Day 7**

Lecture: Genomics 101

Databases continued?

Lecture: Introduction to array technology

SNP analysis?

Lecture: Introduction to NGS

Lecture: Clinical applications of NGS/NGS examples

- **Day 8**

Bioinformatics - an introduction to data analysis

Practical Bioinformatics

Tutorials

Bioinformatics without a bioinformatician

- **Day 9 & 10**

Lecture: Protein theory and sample preparation techniques

Practical: Protein extraction and quantitation

Practical: QC and SDS PAGE

Lecture: In-gel digestion Practical

In-gel digestion