NGS Bioinformatics Course AFRICA 2021

Module 8: RNA-Seq Expression Analysis (Pathogens)

Practical Assignment MEMORANDUM

Module topic: Analysis of RNA-sequencing data Contact session title: Module 8: RNA-Seq Pathogens

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Introduction

This practical illustrates the principles of RNA-seq expression analysis using data derived from bacterial isolates. The practical assignment for this module can be found in the file:

'Module8_RNASeq_Pathogen_Practical.pdf' or

`Module8_RNASeq_Pathogen_Practical_Manual.html`

The participant should follow the instructions outlined in this manual and perform each analysis step as indicated. Each practical section ends with a series of exercises that are compiled in the accompanying assignment document.

Participants should answer the questions at the end of each section and submit their answers by the deadline indicated on Vula.

Learning Outcomes

The learning outcomes for this session are for participants to be able to:

- Use salmon to quantify transcript abundance
- Know how to create a study design file
- Load the required files into R
- Create a DESeq2 data set
- Run DESeq
- Visualise the relationship between samples
- Create a results object
- Rank genes by significance
- Visualise differential expression results

Tools used in this session

List any tools and appropriate URLs or software download information. Please note: use web-based online applications as far as possible.

See Section 1.5 Prerequisites in Module8 RNASeq Pathogen Practical Manual.pdf

Assigned Tasks

See 'Questions' sections in 'Module8_RNASeq_Pathogen_Practical_Manual.pdf'

Additional Information

Supplemental Software Packages and Data

Please take note of the supplemental software and data download instructions in Section 1.6. Internet access will be specifically required to complete that section. Successful completion of the practical depends on having these additional elements.

Multi-line Code Snippets

Please make participants aware of issues that might arise when they are copying and pasting commands into their command line window. In particular, some code lines are long and wrap around when the final .pdf file is rendered. Please let participants know to be careful when copying wrap-around code lines to be careful to transfer each command to a single line and to avoid any carriage returns in the pdf file.

An additional .html file of the practical is also provided. This might be the best option to use for copying and pasting during the practical.