Data Analysis Pipelines

Dr. Stan Kwenda
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AGESA

- Variety of methods and tools are available to analyze bacterial pathogens
- Most bioinformatics tools are implemented in Unix environment
  - Require at least some bioinformatics expertise for usage
- Web-based bioinformatics tools
  - Often free for use
  - Do not require computational power from the user
  - Limited bioinformatics knowledge
  - In some cases demand that that users deposit the analyzed data in public repositories
- Always make an effort to browse through the documentation of web based platforms
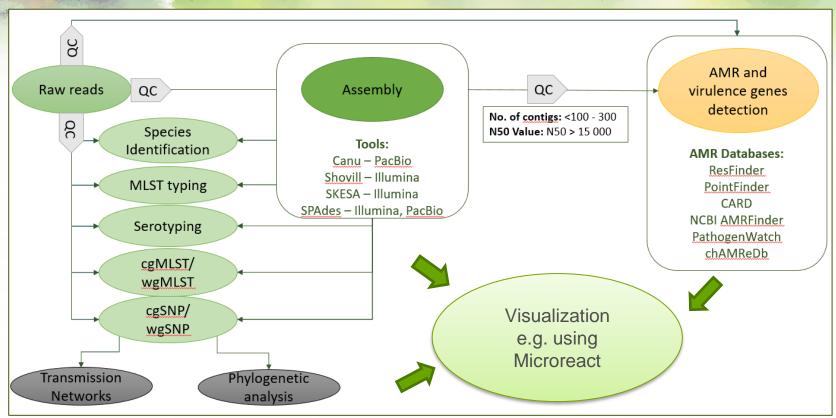 - Helps with choice of parameters and interpretation of results

- Web-based tools
  - PathogenWatch (https://pathogen.watch/)
  - CGE tools (https://cge.cbs.dtu.dk/services/)
  - Galaxy (https://usegalaxy.org/)

- Locally installable:
  - Jekesa (https://github.com/stanikae/jekesa)
  - Tormes (https://github.com/nmquijada/tormes)
  - BacPipe (https://github.com/wholeGenomeSequencingAnalysisPipeline/BacPipe)
  - Bactopia (https://github.com/bactopia/bactopia)
- Commercial (Licensed) tools
  - Genious
  - CLC Genomics Workbench Server

Bacterial WGS Workflow – Overview

Choice of Tools to Use

- Currently no universally accepted "gold-standard" tools.
- Analysts with WGS expertise may prefer different tools optimized to their needs.
  - Support often needed for individuals with limited expertise in deciding type of analyses and tools to use
- 4 things to consider when deciding on optimal tool for a task:
  - Setting/Resources e.g. type of IT infrastructure you have access to?
  - Type of sequencer used,
  - Genetic characteristics of the sequenced organism
  - Purpose of the analysis
- Results from different laboratories should be comparable/reproducible.

Applications of WGS in AMR surveillance

- Supports a consortium of 3 regional sequencing centers in Nigeria, South Africa and Tanzania, including a national centre in Ghana.
  - Provide funding for WGS services for bacterial isolates
- To apply for sequencing you fill in an application form and submit it to the sequencing center in your region
- https://antimicrobialresistance.dk/seqafrica.aspx

Thank you