Bacterial Genome Assembly and Annotation

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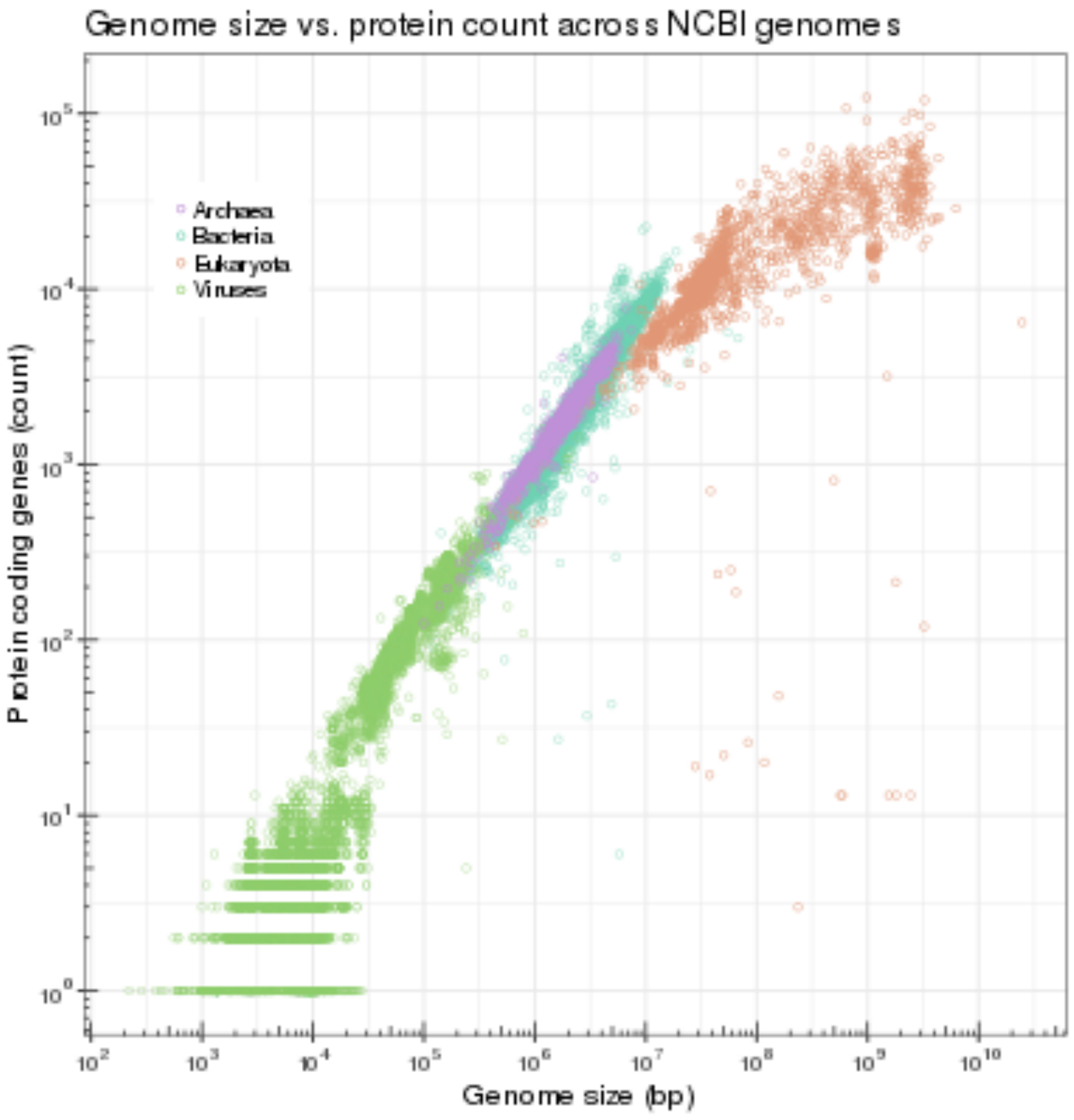
Bacterial Genomes Vary in Size and Structure



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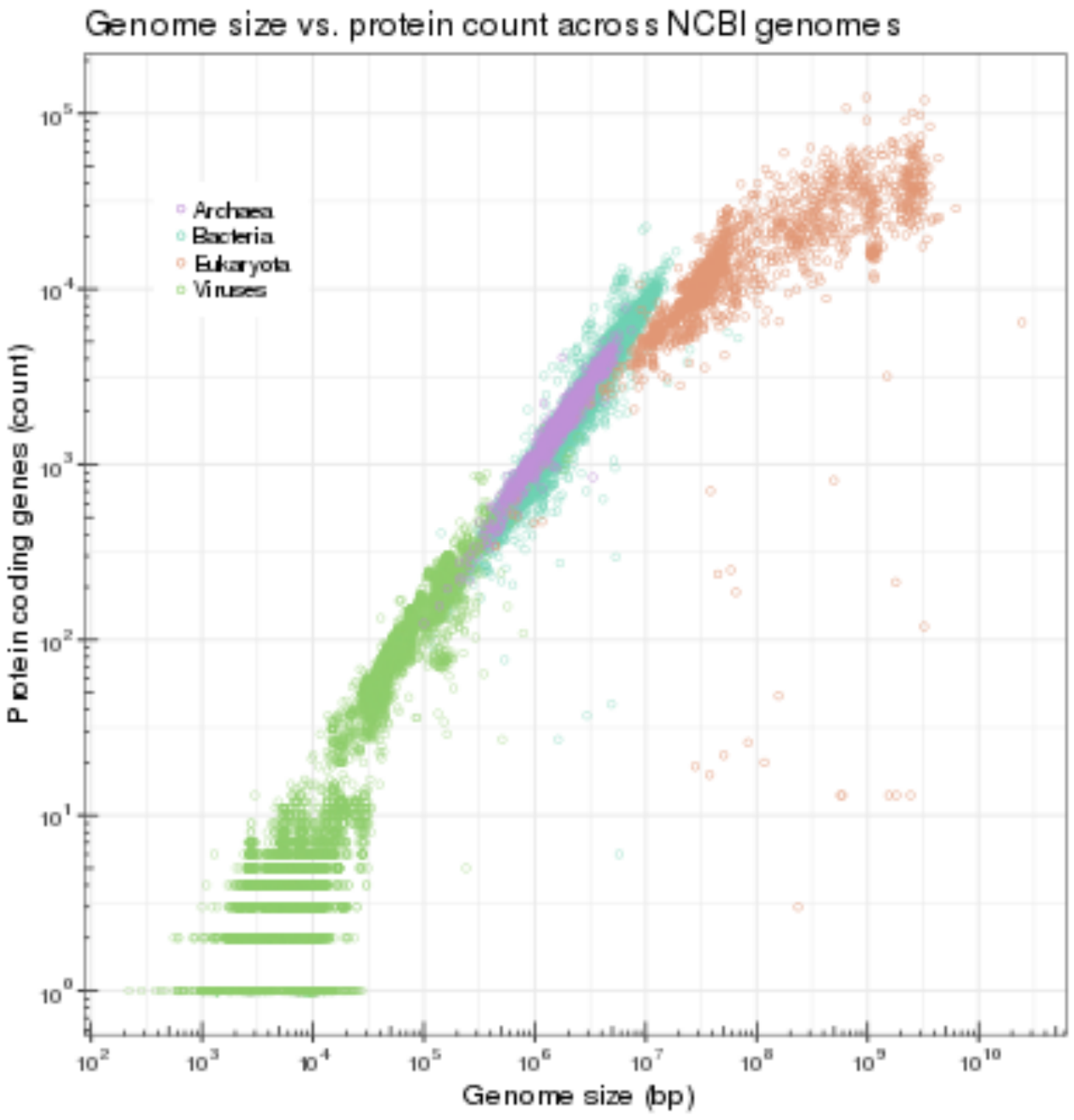

Linear vs. Circular Chromosomes

Plasmids and other Episomes

Assembly and Annotation of Bacterial Genomes

Tools are available for assembly:

SPAdes
Canu
Flye
Shasta
A5
Miniasm

Velvet
Edena
SOAPdenovo

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A couple of pipelines do it all

Unicycler
Trycycler

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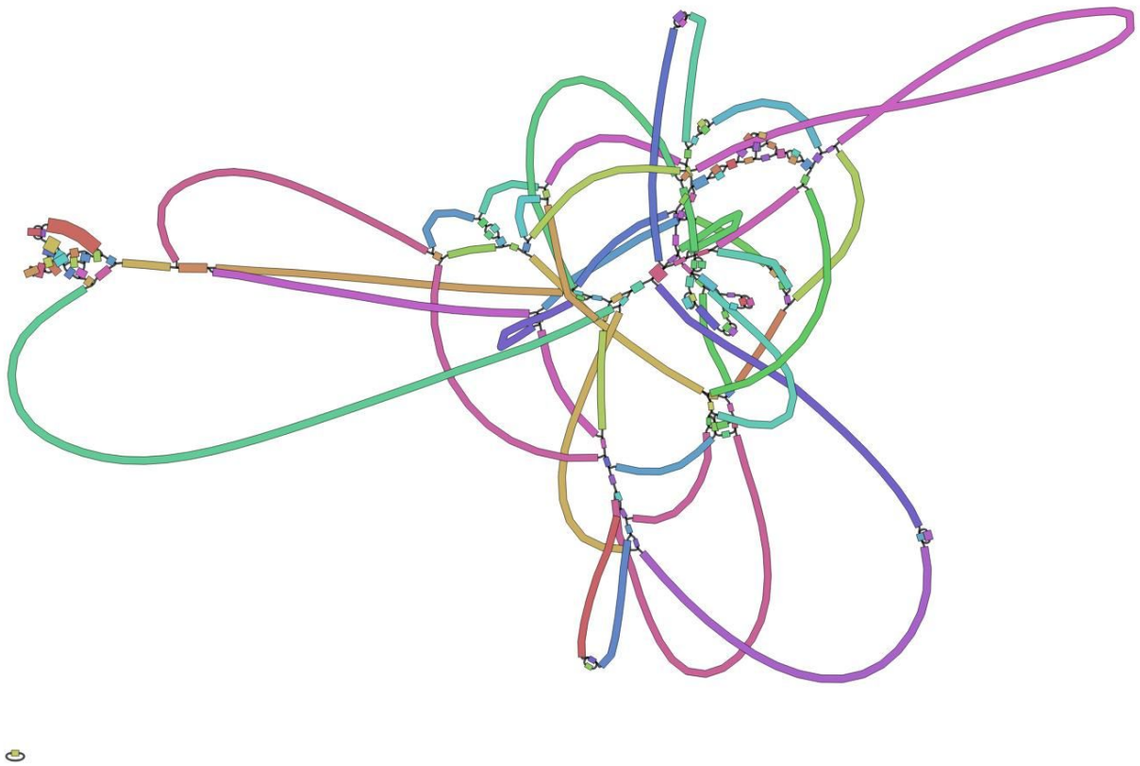
Tools for Annotation

PGAP
RAST
Prokka

Examples of Challenges with Bacterial Genome Assembly: Repeats



https://training.galaxyproject.org/training-material/news/2021/03/24/tutorial_assembly_mrsa.html

Examples of Challenges with Bacterial Genome Assembly: Small Plasmids

Recovery of small plasmid sequences via Oxford Nanopore sequencing

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Wick et al. 2021

Examples of Challenges with Bacterial Genome Assembly: Population Variation