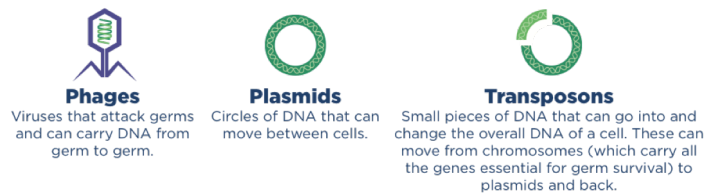
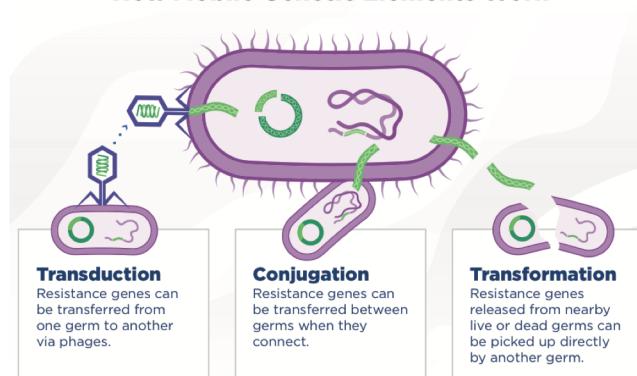


# Genomics of nontuberculous mycobacteria

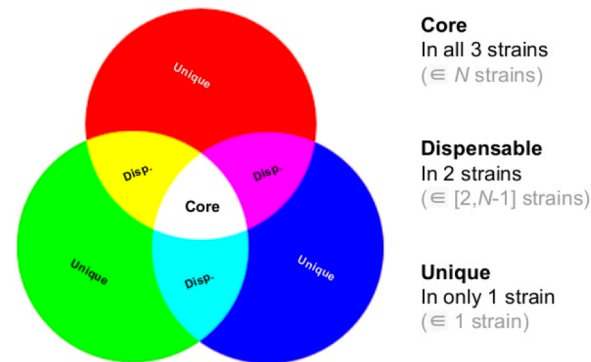


## How Mobile Genetic Elements Work

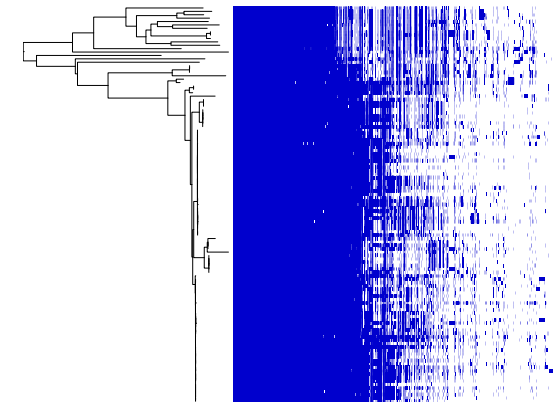


In addition to mutations, mycobacterial genomes also vary their content through mobile elements. Phages, plasmids and transposons introduce and remove genes each generation.

## Three genomes



Mobile elements change the genes present and absent between individual bacteria; so the pan-genome includes the genes unique to an individual, genes found in some, and the core genes found in all bacteria within a species.



Pan-genome variation within a mycobacterial species shows that Hawai'i patient and environmental isolates have similar genes gained and lost.