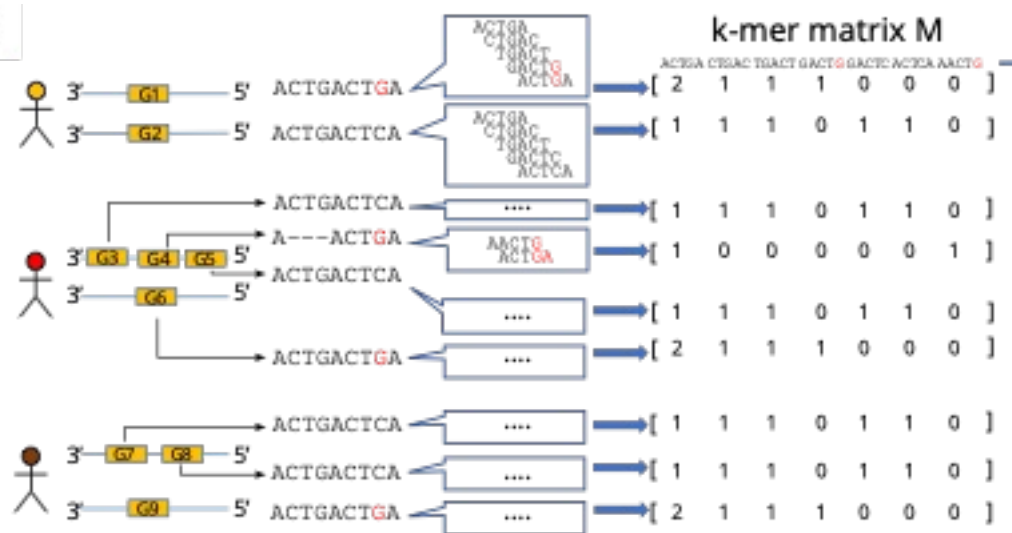


a

● 18 American ● 2 European ● 27 African ● 67 East Asian

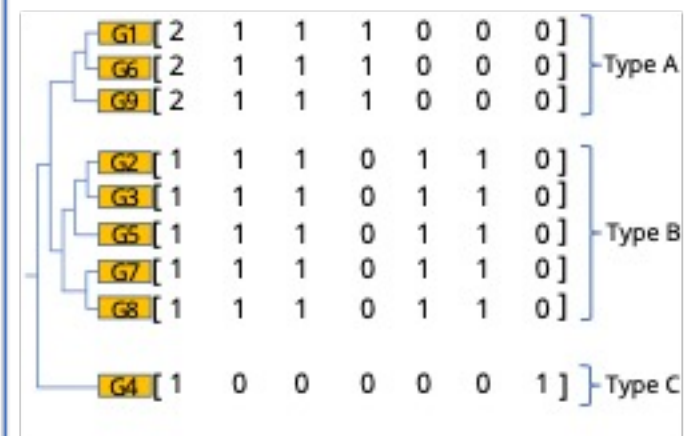


b



c

Phylogenetic tree construction



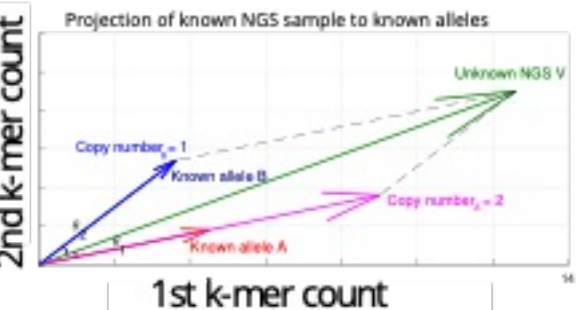
d

NGS

k-mer counting

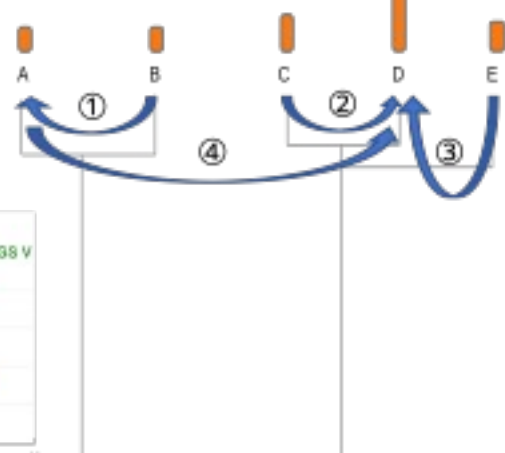
$$\text{Argmin}_x (||MX - V||)$$

Projection of known NGS sample to known alleles



e

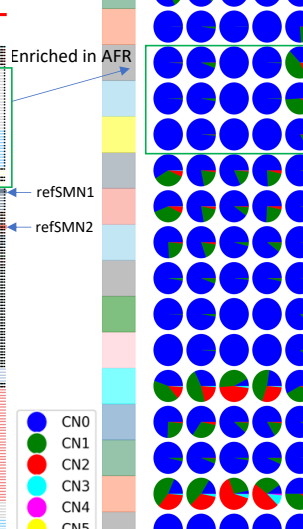
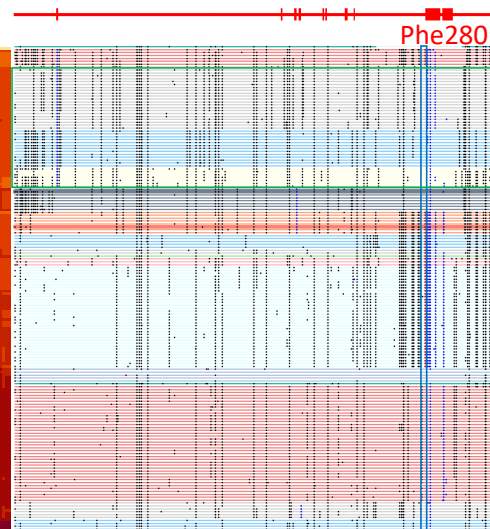
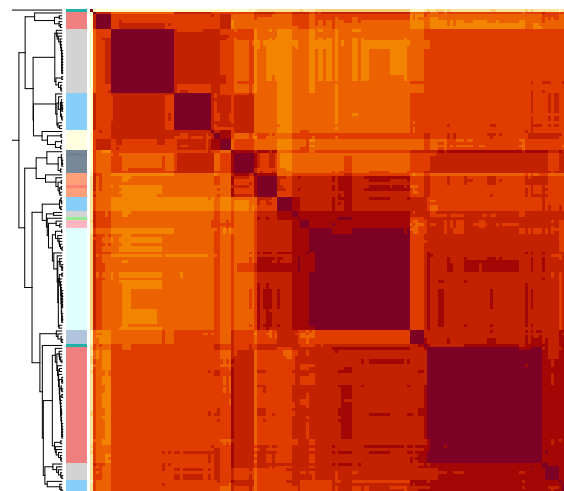
0.45 0.49 0.6 1.9 0.5



f

SMN gene group

SMN2-2 SMN1-conv SMN1-2 SMN2 SMN1



CN: Copy Number

EUR AMR EAS SAS AFR