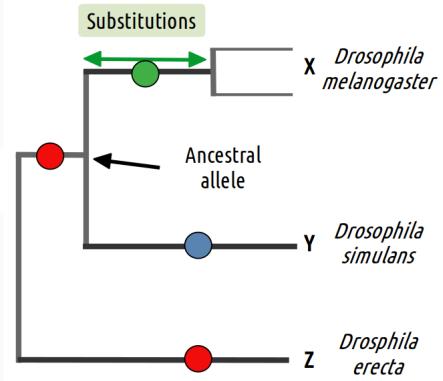


A

We defined the ancestral allele invoking at most one substitution event to explain the observation on the three species

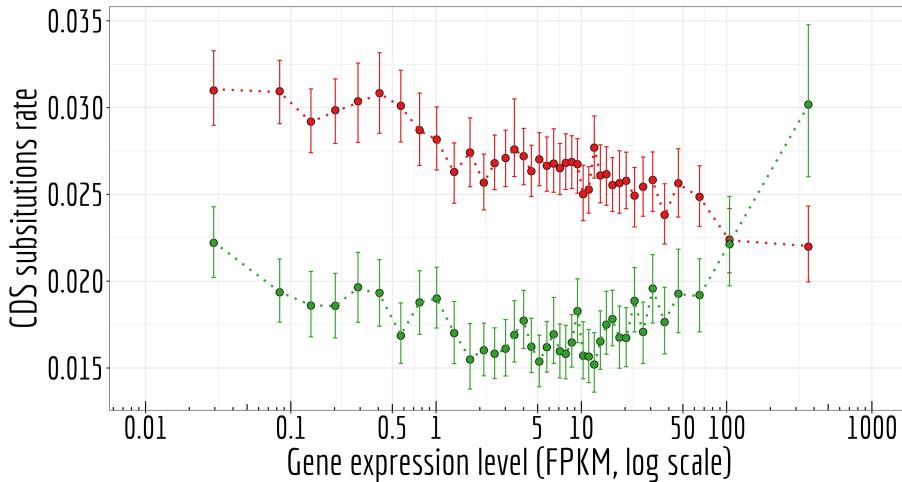
- If $X = Y$ or $X = Z \rightarrow$ ancestral = X (i.e. no substitution)
- If $Y = Z$ and $Y \neq X \rightarrow$ ancestral = Y (i.e. substitution $Y \rightarrow X$)
- Else \rightarrow ancestral = Undefined

B

CDS substitutions rate

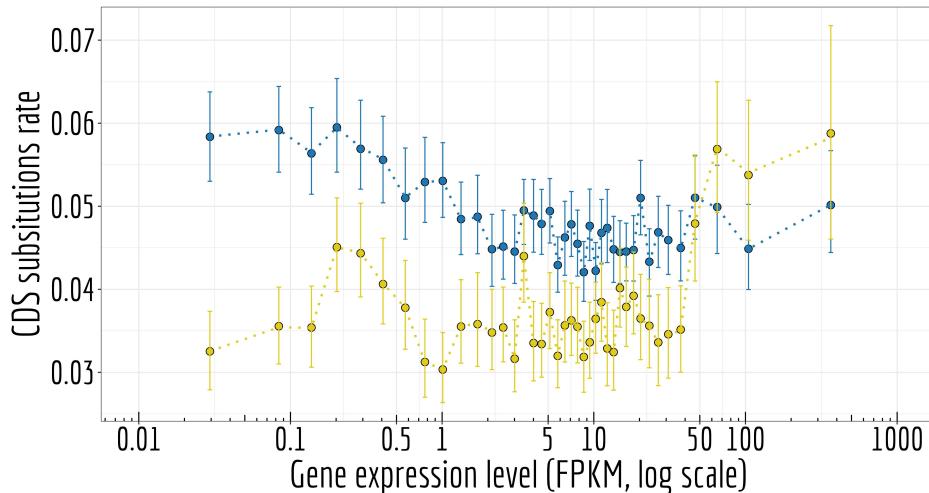
POC for non ambiguous amino acid

● non-POC → POC ● POC → non-POC

**C**

Wobble G:U for ambiguous duets

- watson-crick (NNC) → wobble (NNT)
- wobble (NNT) → watson-crick (NNC)

**D**

Wobble I:C

- watson-crick (NNT) → wobble (NNC)
- wobble (NNC) → watson-crick (NNT)

