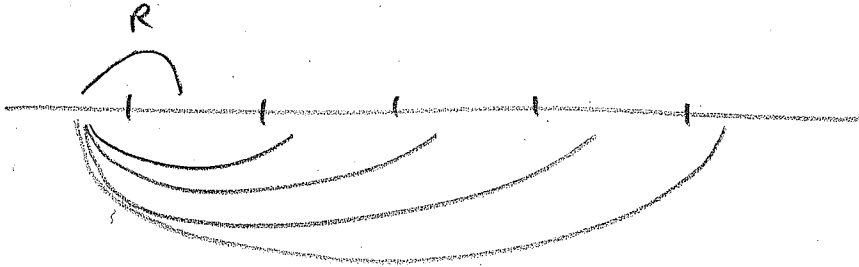


① from the celsim paper, "A o (.8) m (.1, .3) u(b)"



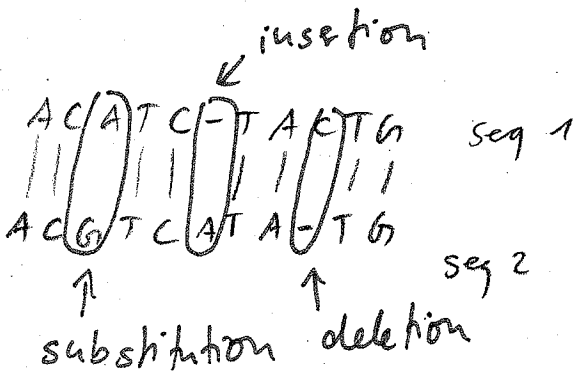
A_i are mutations of some sequence A , \overline{A} is RC of sequence A .

Annotation

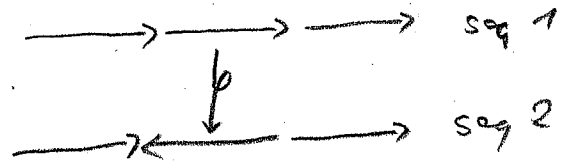


the other edges can be inferred automatically

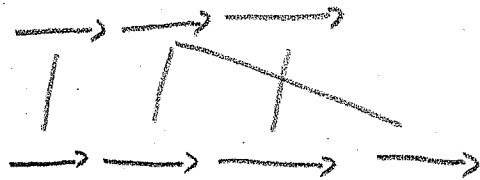
②



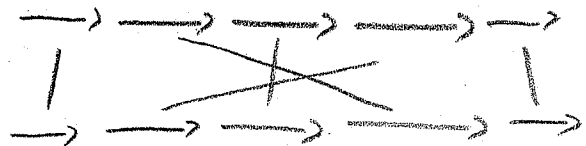
INVERSION



DUPLICATION

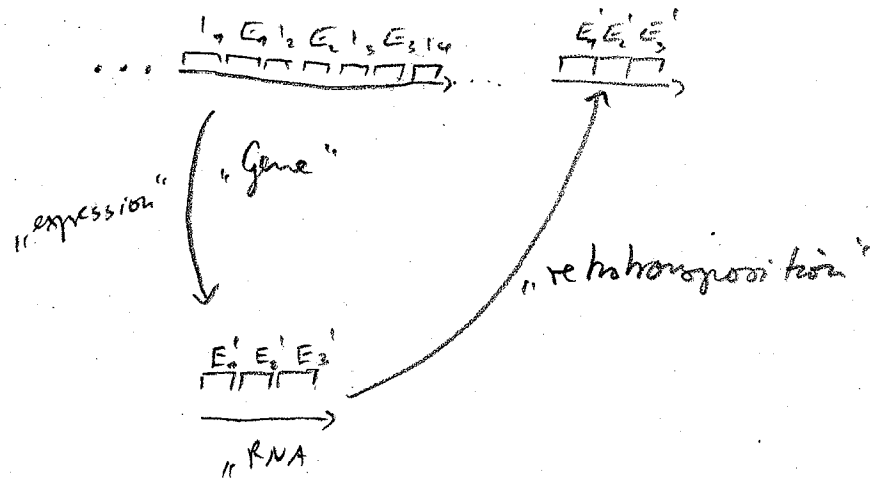


TRANSPOSITION

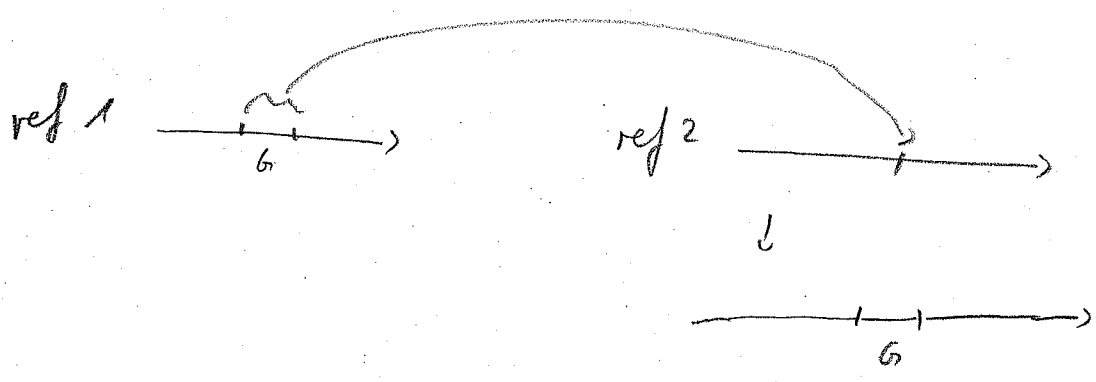


③ Retrotransposed pseudogene

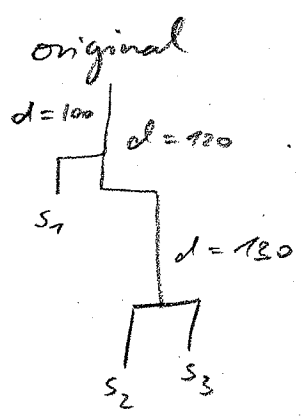
I - Intron
E - Exon



horizontal gene transfer



④



$E\{\text{no of operations}\} = d \cdot d$