GENETIC CONTROL OF RECOMBINATION EXCHANGE FREQUENCY IN ESCHERICHIA COLI K-12

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The frequency of recombination exchanges per unit length of DNA (FREULD) can be estimated by measuring the scale of the genetic map that is the mean statistical distance between the two neighbouring crossovers. The scales appear to be equal for the alternative pathways of recombination, RecBCD (wild-type cells) or RecF (recBC$^-$ sbcB$^-$ sbcC$^-$ genotypes). The absolute value of the scale depends on specific experimental conditions. **recF**, **recQ**, **ruv**, **recJ** and **recN** genes of the RecF pathway of recombination (recBC$^-$ sbcBC$^-$ cell genotypes) do not appear to be silent in wild-type cells where the RecBCD pathway predominates. On the contrary, these genes are responsible for the FREULD. The list **recF504::Km^r > recQ61::Tn3 > ruv-54 > recJ284::Tn10** shows the decreasing efficiency in inhibiting recombination exchanges by these mutations. The **recN264** mutation gives a small, but opposite effect of increasing the frequency of recombination exchanges. The effect of the **recF** and **recQ** mutations appears to be additive, but that is not the case in the combinations of **ruv-54** with **recF504::Km^r** or **recQ61::Tn3**.