Copy of a printed diagram referenced as "Genetic map of the "lac" segment of the Esch. Coli chromosome"

Contributors

Coombes, Dr.

Publication/Creation

October 1962

Persistent URL

https://wellcomecollection.org/works/sr3r4xpp

License and attribution

by the study of mutatio̶̶̶̶̶̶̶̶̶̶̶̶̶̶̶ of the molecular properties of the enzyme. T̶h̶e̶ ̶s̶t̶r̶u̶c̶t̶u̶r̶a̶l̶ ̶g̶e̶n̶e̶s̶ ̶f̶o̶r̶ ̶g̶ transacetylase and galactoside-permease have been identified (with less certainty) as adjacent to the galactosidase (z) gene.

(2) Many 'constitutive' regulator mutants have been studied. They all 'map' outside of the structural genes. They all affect simultaneously, and to the same extent, galactosidase, galactoside-transacetylase, and galactoside-permease. These mutations do not detectably affect the properties of the enzymes. The constitutive allele is recessive to wild-type.
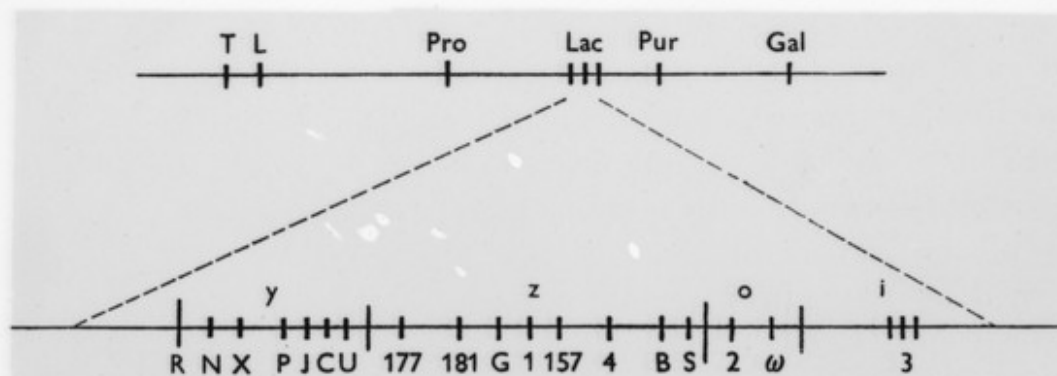
Genetic map of the 'Lac' segment of the *Esch. coli* chromosome. All the mutations which affect specifically the synthesis of β-galactosidase, galactoside-transacetylase and galactoside-permease, have been found to map in the so-called 'Lac' segment of the chromosome. The position of this segment (whose length corresponds approximately to $\frac{1}{500}$th of the total linkage group) is shown on the upper line. The lower line represents an enlargement of the Lac segment, showing its division into four determinants: y and z = structural genes, o = operator of the y–z group, i = regulator gene. The vertical lines indicate the order of a number of mutations within each determinant.

̶ be made:

(1) This allele should be *dominant* towards wild-type: in diploid, bearing the wild-type chromosome, it should block the synthesis of the enzymes (see Fig. 7).

(2) The mutant organisms should regain the ability to synthesize the two enzymes by achieving the 'constitutive' state, i.e. by inactivation of the regulator gene.