

Radiogenetic studies on Gal/Lambda transduction

Memorandum for Latarjet and Marcovich

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This project is based on preliminary studies of M. L. Morse, who should be consulted ~~for~~ before proceeding further.

The objective is a combined genetic and kinetic study of UV and X ray effects on the transmission of Gal markers by lambda. It is comparable to studies on transforming DNA of pneumococcus (Latarjet & T. Ephrussi) and on T2 (Doermann and Stahl). However, this material has the great advantage that the genetic fragment, which can be irradiated either in the host bacterium or in the free phage, persists as such in the heterogenetic condition after it is introduced into the recipient cell. It is therefore possible to study the type of damage imposed on the fragment by direct genetic test, and not only by inference of the kinetics of loss of activity. A further advantage over the DNA system is the homogeneity of the particles, almost all of which may, in special situations, be obtained to carry the specific genetic factors.

The existing data are: 1) that UV results in an initial increase in activity followed by a very slow decline. The increase may be related to the interference function of the bacteria against lambda infection, as it is different in different types of recipients. The decrease is not yet known to be genetic damage rather than loss of absorbability. 2) With higher doses of UV, the quality of the transductional products changes, in regard to the incidence of lysogenization and of heterogenosis.

A second, possibly related problem is discussed in the CSH 16 (1951) article: the search for evidence of recessive lethal effects in the irradiation of diploid strains of E. coli.

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