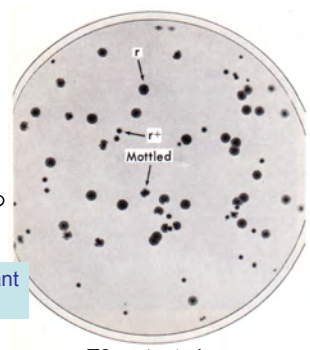


11. Photograph of phage T2 plaques on a lawn of *E. coli* bacteria

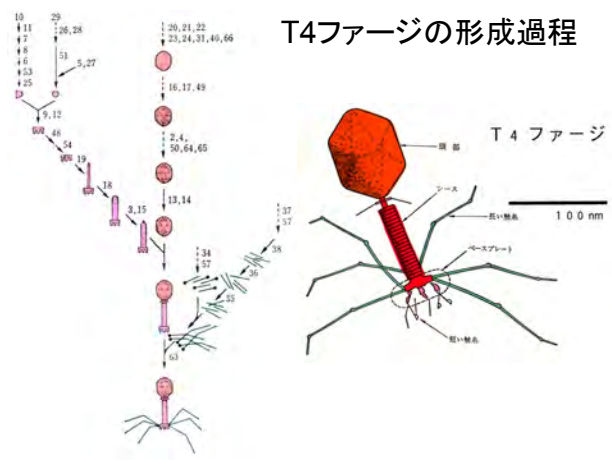


T2 phage  
 原因は分からないが、プラークの形をかえる変異を得ることが容易にできた  
 T2 r : rapid-lysis mutant  
 T2 r<sup>+</sup>: wild-type

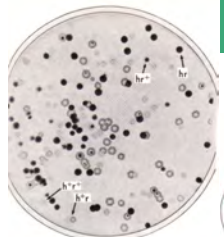


T2 mutant phage

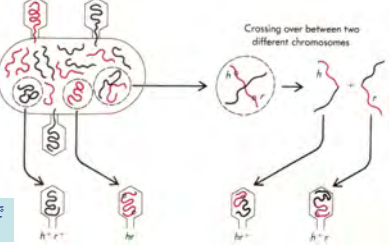
T4ファージの形成過程



13. Phage recombination in cells infected with two different strains of phage T2



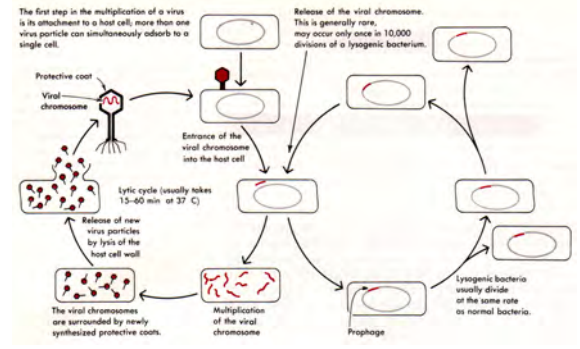
T2h:野生型T2が吸着できない大腸菌B/2に感染できる変異株  
 T2 r : rapid-lysis 変異株



大腸菌B株とB/2株の混合菌でプラークを作らせることで、h<sup>+</sup>r<sup>+</sup>、h<sup>-</sup>r<sup>+</sup>、h<sup>+</sup>r<sup>-</sup>、h<sup>-</sup>r<sup>-</sup>を区別

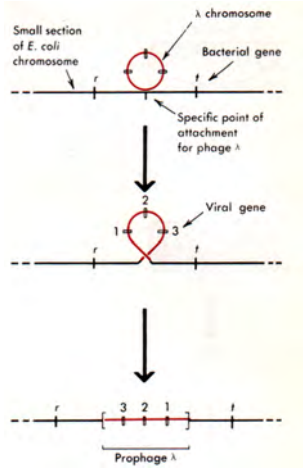
1945年: 変異株ファージ間での遺伝的組み換えの発見

29. The life cycle of a lysogenic bacterial virus

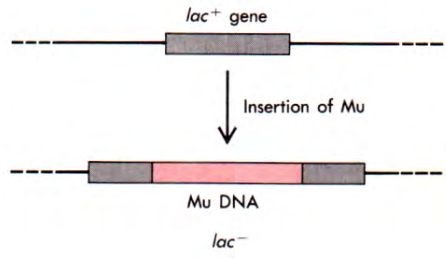


溶原化ファージ→λファージ→プロファージ

30. Insertion of the chromosome of phage λ into *E. coli* chromosome

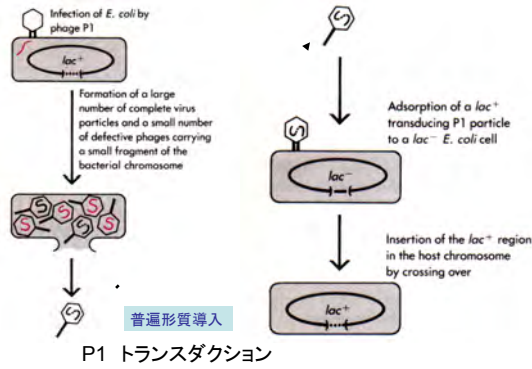


Insertion of Mu DNA



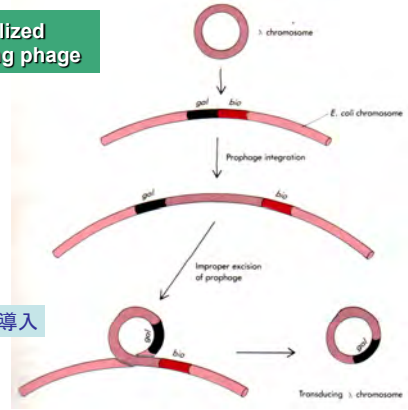
Muはλファージと異なり、挿入が起こる場所はランダムである

**Transduction, the passive transfer of genetic material from one bacterium to another by means of carrier phage particles**

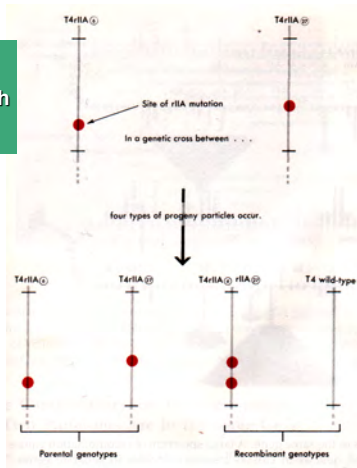


**Specialized transducing phage**

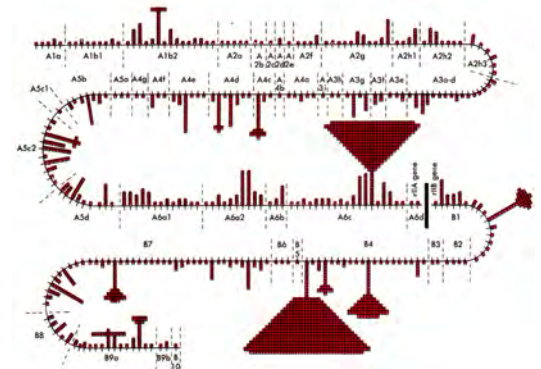
特殊形質導入



**The demonstration of crossing over with in the gene**

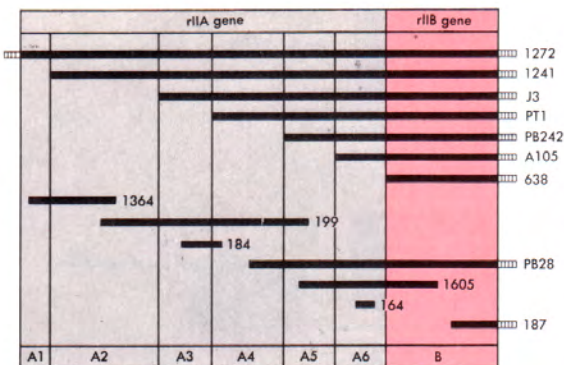


**The genetic map of the rIIA and rIIB genes of phage T4**



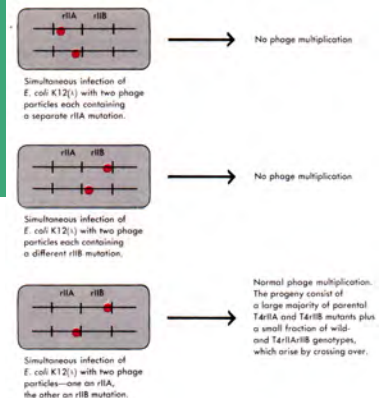
S. Benzer, PNAS, (1961) 多くの変異部位を同定することで、遺伝子には変異する部位がたくさんありそれが線状に配列していることが分かった。

**Deletion mutations with in the rII region of T4**



**The rII region consists of two distinct genes that can complement each other during simultaneous infection**

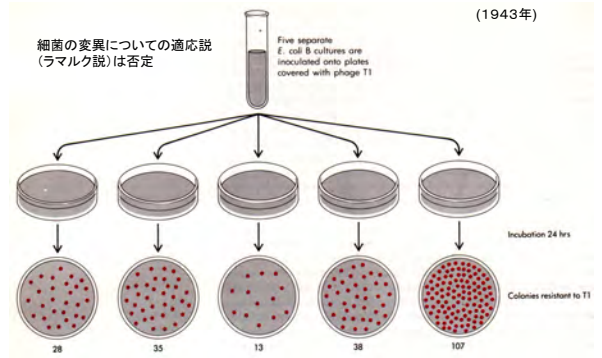
相補性検定  
シストランス検定  
シストロン



# The Genetic Systems Provided by *E. coli*

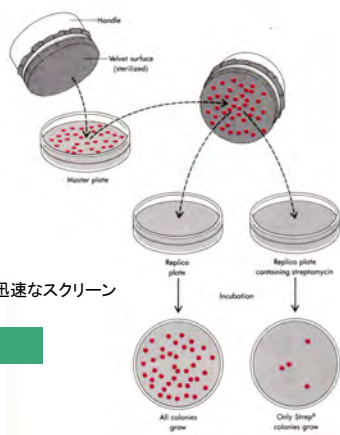
## Molecular Biology of the Gene

### 1. Fluctuation analysis of bacterial resistance to phage



遺伝マーカーの迅速なスクリーン

### 2. Replica plating



### 3. Isolation of mutant *E. coli* cells with a specific growth factor requirement

