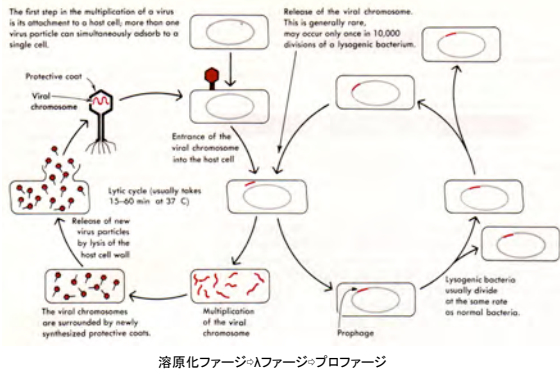


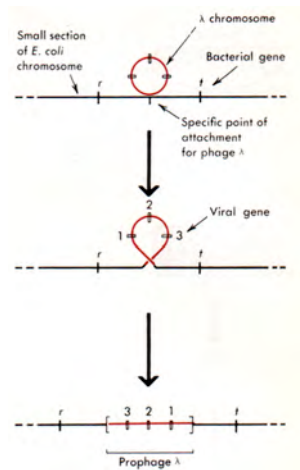
29. The life cycle of a lysogenic bacterial virus



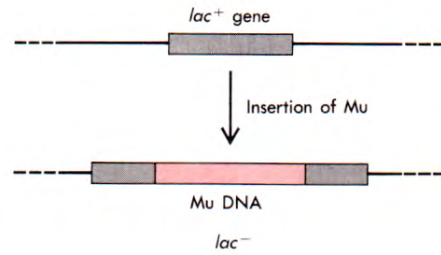
The Fine Structure of Bacterial and Phage Genes

Molecular Biology of the Gene

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

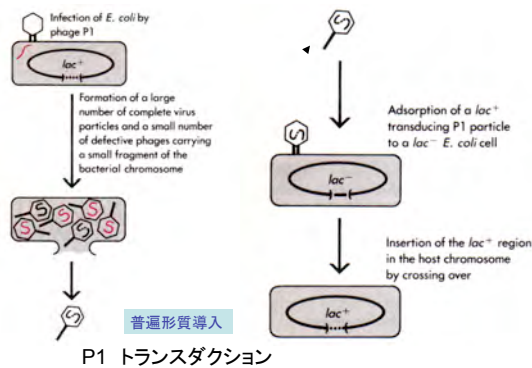


Insertion of Mu DNA

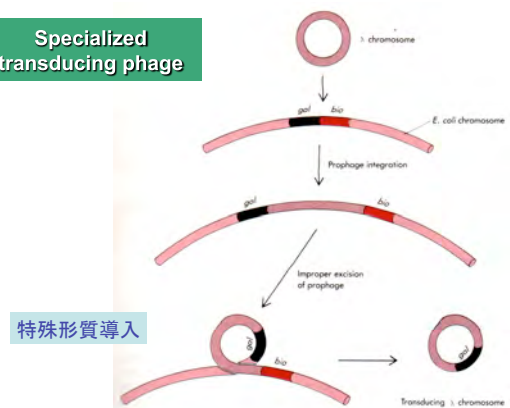


Muはλファージと異なり、挿入が起こる場所はランダムである

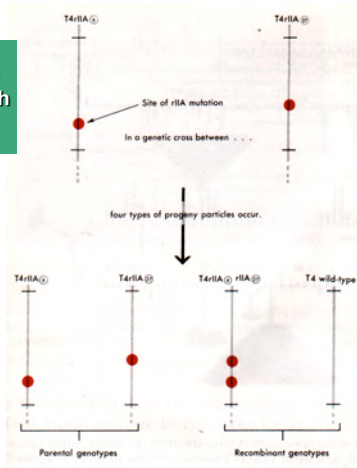
Transduction, the passive transfer of genetic material from one bacterium to another by means of carrier phage particles



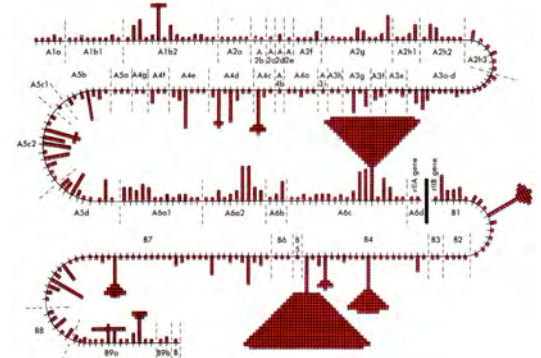
Specialized transducing phage



The demonstration of crossing over with in the gene

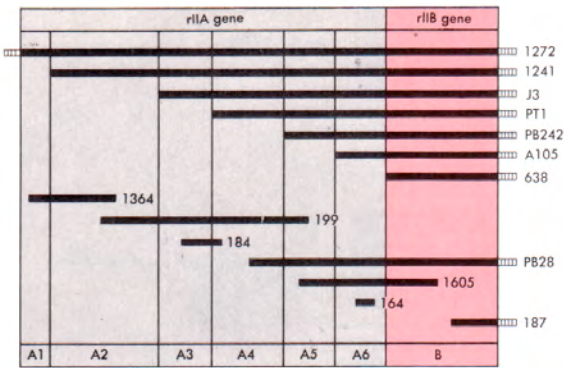


The genetic map of the *rIIA* and *rIIB* genes of phage T4



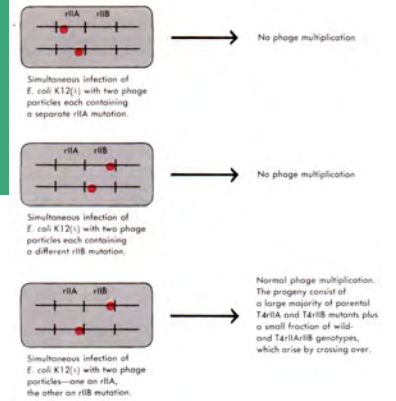
S. Benzer, PNAS, (1961) 多くの変異部位を同定することで、遺伝子には変異する部位がたくさんありそれが線状に配列していることが分かった。

Deletion mutations within the *rII* region of T4



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

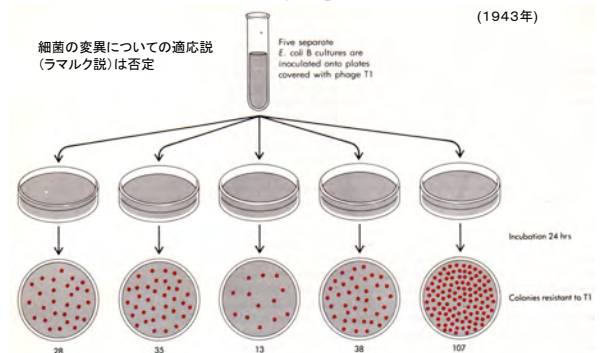
相補性検定
シストランス検定
シストロン



The Genetic Systems Provided by *E. coli*

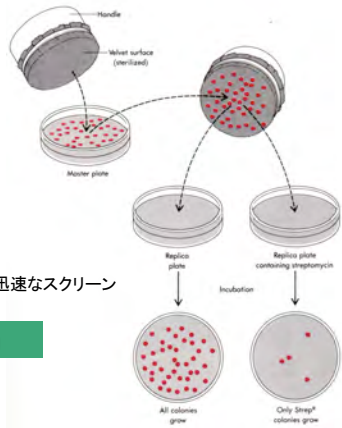
Molecular Biology of the Gene

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

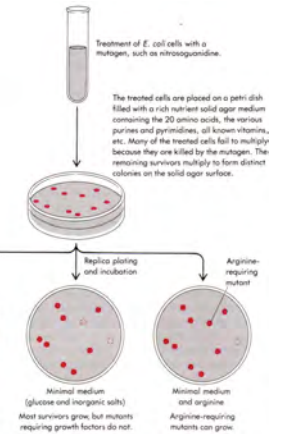


3. Isolation of mutant E. coli cells with a specific growth factor requirement

必須代謝物合成能に影響を与える変異体の分離

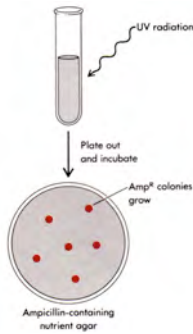
栄養要求株 (auxotroph)
原栄養株 (prototroph)

(1944年)

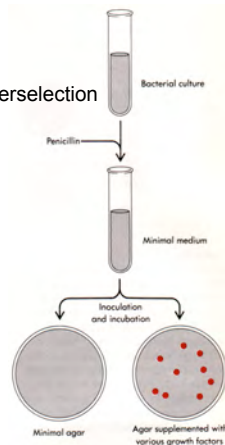


4. Enriching mutants I

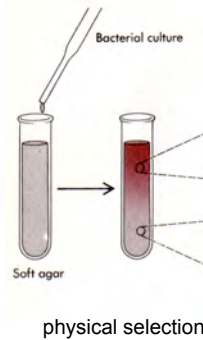
direct selection



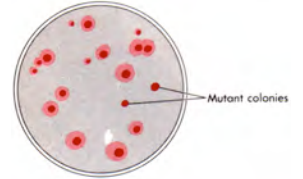
counterselection



5. Enriching mutants II



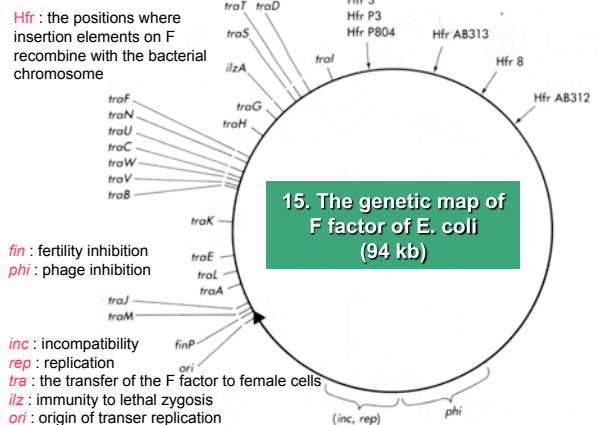
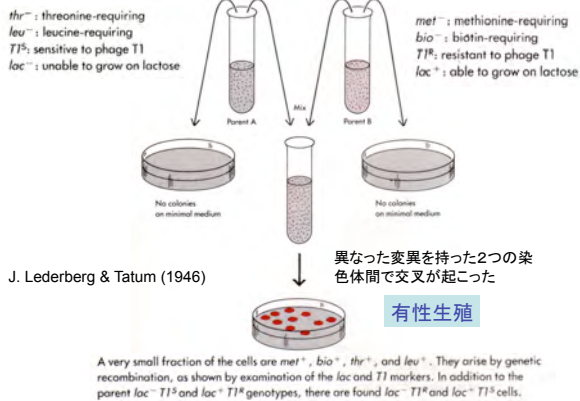
pH-sensitive dyes to detect metabolic mutants



Brute force isolation

変異剤を使った後、1万個のコロニーを各々スクリーニングする。

8. The use of growth factor requirements to demonstrate sexuality in E. coli



16. The attachment of a male F pilus to the surface of a female cell

