

June 1, 1951

REPORT ON RESEARCH PROJECTS
for the
FISCAL YEAR 1950-51

50:304

I. Name LEDERBERG, Joshua Dept. Genetics Proj. No. _____

Title Bacterial Genetics

II. Personnel: **Ethelyn Lively, Phyllis Fried** Research Assistants
Norton Zinder Res. Asst. (NIH)

E. Lederberg Project Associate (Chemical Corps)

III. Statement of other financial support, if any:

Rockefeller Foundation \$7500/3 years (expired 5/1/51)

National Institutes of Health \$4000

Chemical Corps Contract \$ 6000 (18 mos.) [only indirectly related]

IV. Brief statement of specific progress made during the year:

1. A new mechanism of genetic exchange was found in *Salmonella typhimurium*, involving filter-passing entities produced by the bacteria under stimulus from deleterious agents such as penicillin or phage. These entities may be related to the L-forms described by other workers.

2. A method was developed and successfully applied to screen fresh isolates of *Escherichia coli* for their ability to hybridize with strain K-12, previously unique in this quality. From about 650 strains tested, 20 have been found that can be crossed. They are of a variety of cultural and serological types: the genetic basis of their natural differences is under study.

3. Genetic and cytological effects of radiations (ultra-violet light) were correlated/ The effects of UV in causing nuclear aberrations persist in some progeny after other descendants of a single cell have apparently recovered. The basis of killing by radiations appears not to be hereditary lethal mutations to any extent, but rather a damage to nuclear material from which later recovery is possible, in *Escherichia coli* but not others.

V. Publications that have appeared in print during the present fiscal year:
Lederberg, J., Isolation and characterization of biochemical mutants of bacteria. Methods of Medical Research, 3: 5 - 22, 1950

The beta-D-galactosidase of *Escherichia coli*, strain K-12. Jour. Bacteriology, 60: 381-392, 1950 (October)

Streptomycin resistance: a genetically recessive mutation. Jour. Bacteriology, 61: 549-550, 1951 (May)

Zelle, M.R., and Lederberg, J., Single-cell isolations of diploid heterozygous *Escherichia coli*. Jour. Bacteriology, 61: 352-355, 1951 (March)

VI. Manuscripts accepted for publication but not yet printed:

Lederberg, J., Genetic studies with bacteria. IN Genetics in the 20th Century, MacMillan, New York, 1951 (June?)

Prevalence of *E. coli* strains exhibiting genetic recombination. Science, In Press

The pink copy should be returned to the Graduate School Office on or before July 1, 1951. The blue copy is for your file.

Lederberg, J., Lederberg, E., Zinder, N.D., and Lively, E.R., Recombination analysis of bacterial heredity. Cold Spring Harbor Symposia on Quantitative Biology, XVI, 1951, In Press.