Yale University

Department of Human Genetics
Yale University School of Medicine
I-310 SHM
P.O. Box 3333
New Haven, Connecticut 06510-8005

Campus address:
I-310 Sterling Hall of Medicine
333 Cedar Street

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Dr. Joshua Lederberg, President
Rockefeller University
1250 York Avenue
New York, NY 10021

Dear Josh:

I don't have any bibliography on crossing-over in K-12 and I don't know of anyone else who would have one. The results of thousands of crosses are scattered through the literature and it would be difficult to locate them. Once cotransduction became available for mapping, very little was done with conjugational mapping. The usual procedure is to do a conjugational cross to get a rough idea as to where the locus is and then to map it by cotransduction. Often the data for the conjugational crosses aren't even published in the papers reporting mapping of new loci.

So one would have to go back to the older literature. Some papers that might be very helpful to you in thinking about this and in locating the older literature are:

Low, K.B. 1972 Escherichia coli K-12 F-prime factors, old and new. Bacteriol. Revs. 36:587-607.
(This paper described all of the Hfr's and the F's derived from them.)

Low, B. 1973 Rapid mapping of conditional and auxotrophic mutations in Escherichia coli K-12. J. Bacteriol. 113:798-812.
(This paper deals with mapping using Hfr's and F's.)

Low, B. 1967 Inversion of transfer modes and sex factor-chromosome interactions in conjugation in Escherichia coli. J. Bacteriol. 93:98-106.
(This paper has some time-of-entry date for distant markers in interrupted matings.)

Broda, P. 1967 The formation of Hfr strains in Escherichia coli K12. Genet. Res. 9:35-47.
(This was interesting in its day, but note that R. Deonier has studied in recent years the IS sites at which F integrates to form Hfr's and it is worked out at the molecular level.)

For older literature giving the results of conjugation studies, Jacob and Wollman's book "Sexuality and the Genetics of Bacteria", Academic Press. (1961) should be helpful.

Also, in the early genetic maps of A.L. Taylor, he reported the mapping of many markers by conjugation experiments. These papers are:

Taylor, A.L. and M.S. Thoman 1964 The genetic map of Escherichia coli K-12. Genetics 50:569-677.

Taylor, A.L. and C.D. Trotter 1967 Revised linkage map of Escherichia coli. Bacteriol. Rev. 31:332-353.

Taylor, A.L. 1970 Current linkage map of Escherichia coli. Bacteriol. Rev. 34:155-175.

P.G. de Haan mapped some markers by "gradient of transmission" and proposed the general use of the method. de Haan et al. 1969 Recombination in Escherichia coli. III. Mapping by gradient of transmission. Mutat. Res. 8:505-512. (This method turned out to be rather inaccurate, at least in his hands. His mapping of guaC was about 3 minutes off in this paper.)

That's about all that I have to offer. The precise location of the points of origin of most of the Hfr's is now known. Many distances on the map are known in kilobases. Some Hfr's transfer the chromosome faster than do others. All slow down as transfer proceeds, some more than others. (1) Markers that are transferred very early are not often integrated. All of these things can now be taken into account.

Sincerely,

Barbara

Barbara J. Bachmann
Curator, E.coli Genetic Stock Center

BJB/rsj