

September 19, 1949.

Dr. L. Cavalli,
Dept. Genetics,
University of Cambridge,
England.

Dear Cavalli:

I am sorry to have to conclude and report to you that selection has probably been responsible for a major perturbation of my experiments on recombination in complete medium, using your Hfr stocks. You will remember that in my letter of August 24, which crossed yours of the 19th, I mentioned the finding of sectored colonies which I hoped might represent actual segregating zygotes. But the components of these colonies were very peculiar, consisting always of a special recombination type, and of a particular parent. I had thought that these colonies might be segregations because of the high frequency with which the Lac- component (for example) was a recombinant.

Since, it turns out that the overall frequency of the Lac-Mal- recombination in, e.g. mixtures of W-314 and W-1059, is very high, and may, indeed exceed that of the parental Lac- (Mal+). Therefore, there is no especial correlation with recombination in the sectored colonies, as I had thought as an indication that there were really segregating. This also suggests that there is a recombinant, which happens to be Mal-Lac-, which has a high selective advantage. A few preliminary tests, reconstructing the "crosses" but introducing a marked "recombinant" support this, with selective coefficients of 10x to 1000x for the "recombinant". I do not yet know whether this selective superiority depends upon combinations of known or of unknown factors, or whatever conditions can be found wherein it is vitiated.

the

This finding also explains the non-occurrence of the complementary Lac+Mal+ recombinant, and also the apparently greatly reduced rate of recombination in crosses attempted between more closely related stocks. I have not succeeded in finding segregating colonies in crosses of other B-M stocks with W-1033 or its derivatives. I am still convinced of the high sexual potency of Hfr, but it simply is not of the order that I had thought from these experiments.

Newcombe and I have just (independently) brought streptomycin-resistance on to the linkage map. It is linked closely to Mal₁. Need I say more? Dr. M. Doudoroff and I were trying to test dominance in heterozygotes, but found all the diploids to be hemizygous for SR.

Sincerely,

Joshua Lederberg