

12/15/55

Mr. D. A. Hopwood  
Botany School  
University of Cambridge

Dear Mr. Hopwood:

Thank you for your letter of the 21st.

My first experiments on streptomycetes, to look for genetic recombination, were started in November, 1951. Auxotrophic mutants were obtained in *S. griseus*. When mixed, they showed a pronounced syntrophism, but this was sufficiently abated in some combinations that discrete prototrophic colonies could be detected at low yields. However, the spores from the prototrophs segregated almost completely into the parental types, and I could conclude only tentatively that heterokaryotic mycelia had formed. At this point, Dr. Cavalli and I were just finding out about the compatibility system (F, Hfr, etc.) in *E. coli* ~~Excerpt~~ and this work was temporarily suspended. These rudimentary findings were quoted only obliquely and unsatisfactorily in the review you mentioned, and in "Perspectives and Horizons in Microbiology" (Rutgers University Press, S. Waksman, ed., 1955).

Dr. S. G. Bradley came here as a postdoctoral fellow in September 1954 to continue this program. Our efforts to demonstrate genetic recombination (e.g., as stable prototrophs or other non-parental combinations of auxotrophic and other markers) ~~in S. griseus~~ <sup>unsuccessful</sup> and *S. cyanus* have been quite ~~negative~~. There must be a real difference (homo- vs, hetero-thallism?) between these species and *coelicolor*. However, we have been able to substantiate the occurrence of heterokaryons by the recovery of parental genotypes from isolated single hyphal fragments. Dr. Bradley is continuing his studies largely in an effort to elucidate the difference between the various species.

We are in the throes of completing a manuscript on the heterokaryons, and I will be happy to send Dr. Whitehead a copy when it is ready (during the next few weeks, I hope). I am sure that Dr. Bradley and I will be happy to keep in touch with you on the grounds of common interest; we are planning to communicate with Dr. Sermonti in the same vein.

Yours sincerely,

Joshua Lederberg  
Professor of Genetics