

Dear Esther & Joshua,

Merry Christmas. Hope you had a nice time in Australia. I had a very enjoyable trip and scientifically stimulating month in California. I saw Larry on my return trip & we compared notes.

Thanks for the note about the origin of λ paper. All the ^{markers} ~~mutants~~ I am now using are ones which came from this stock (except 434 in 434 hybrid, of course.) I like Cold Spring Harbor very well and am getting about 10X as much done per day as at Michigan.

I have no new myosin discoveries, but have written on the inside of the card some of the small facts about gal-ductin which have come to light since I last saw you.

Regards, Allan

MAY CHRISTMAS AND THE NEW YEAR

BRING YOU EVERY HAPPINESS

Campbell* 1957

1) Heterogenotes formed by transduction of lysogenic cells are mostly doubly lysogenic for markers in the immunity region. Gal⁻ segregants from these strains are mostly single lysogens

2) 434 hybrid will give LFT. The transduction clones generally consist of heterogenotes which produce HF⁻ phages like those of λ (giving i.e., the transduction of sensitive cells at low m.o.i. gives mostly defective heterogenotes, transducing particles apparently lacking markers from the λ region)

3) If one transduces K(λ ms₁₀) with λ h, the ^{proportion} number of gal⁺ recipients carrying h approaches 0 as the m.o.i. decreases. \therefore the "double lysogens" I ~~study~~ in my paper arise from multiple infection and are probably ~~really~~ triple lysogens with some kind of association between a prophage and a defective prophage which causes them to ^{be lost} ~~segregate~~ together.

4) I want to study the segregation patterns of strains of the type K(λ def gal₁⁻) (434 def gal₂⁻) with other markers on the prophages, to determine the ~~order~~ position of gal in the defective prophage. Such strains have been made by transduction of gal⁻gal₂⁻ recipients with a mixture of ~~homogeneous~~ phages from homozygotes, but I have not yet completed the analysis.

5) The system λ , 434 HF⁻ is completely symmetrical with regard to all interactions studied; i.e., for any labels S, $S(\lambda, 434) \leftrightarrow S(434, \lambda)$. This includes the

genetic constitution of the transducing donor, their segregation patterns, and the "helping" phenomenon which gives rise to the multiplicity effect with sensitive recipients. The rule is that a non-transducing phage will help if and only if the recipient does not carry a prophage which is common with it, irrespective of the immune specificity of the transducing "phage".