

May 14, 1952

Dr. Ellis Englesberg  
Hooper Foundation  
U. Cal. Medical Center  
San Francisco 22, Calif.

Dear Ellis:

Borton Zinder was describing the symposium at Boston on "prototroph" just the moment your letter came in.

Your usage of prototroph is certainly correct. Remember that words are the tools of men, and not vice versa. The context in which "prototroph" developed was that of the re-isolation of nutritional wild types from auxo-heterotrophic mutants. In your context, it might be confusing and I think it would be better to avoid "prototroph" altogether; otherwise you will have to define your terms very explicitly.

You might be interested in the evolution of "auxotroph". [I think it better to accept it as a bastard word than force it into a meaning it does not have, of greater growth requirements. The auxo- means growth factor, as in auxin]. The expressions auxo-heterotrophic and auxo-autotrophic were already more or less acceptable, the prefix specifying the context of growth factors rather than C or energy nutrition. Auxotroph is simply an abbreviation of auxo-heterotroph. These terms are "absolute", lacking the directional connotation of prototroph.

Prototroph is related to a prototype. This would ordinarily refer to the wild type, as is. But it is theoretically sound to regard the auxo-~~mutant~~ autotroph as the ancestral prototype of *P. pestis*, and you could transfer the terminology on this basis. However, I still think it would be best of all not to use prototroph at all in this context. Except that no one will be able to spell or pronounce it, ischaotroph would have its uses. I would prefer "auxoautotrophic".

If you are going to coin a new term, why not go after the suffix end. Auxotroph has the context that the organism feeds (dependently) on growth factors. Why not dig up a termination in place of -troph to imply that it synthesizes its own, or that it is self-sufficient.

Zinder is working on the kinds of experiments you brought up. No *S. typhimurium* is nonlysogenic, unfortunately. Streptomycin-resistance may already serve for what you so-call a "negative" hereditary trait.

Sincerely,

Joshua Lederberg