

Dept. Genetics
University of Wisconsin
Madison 6, Wis.

Communicable Disease Ctr.
Chamblee, Georgia.

Dear Dr. Groman:

Of course we have a community of interest on the induction of toxicogenicity in *C. diphtheriae*!

When I first saw the Freeman-Morse and Frabisher papers, I wondered if transduction might be involved. It seemed to me not, if phage could be passed on a negative strain, and subsequently induce tox. the same strain. Is this true?

To put the same question another way, does every culture that becomes lysogenic also become tox? If there is a constant association between tox. and lysogenicity, regardless of the immediate previous host of the phage, it is not likely to be transduction ~~inexplicably~~ as seen in Salmonella. In this system, the role of phage seems to be entirely the carrying over of genetic factors from one host to another. If the association is inseparable, the phage can hardly be regarded as a casual, passive carrier. In Salmonella, ^{each} ~~every~~ phage particle has a probability of only about 10^{-6} of transducing a particular trait. Under special circumstances, a phage particle can discharge its genetic passenger without itself initiating lysogenicity, but this is exceptional.

Another system that seems to require lysogenization per se, and not incidental transduction by the phage, is the determination of Vi types of *S.* as studied by Anderson. Here too, most if not all cells infected with typhi the appropriate phage are correspondingly altered in Vi-type.

The points of difference you mention are entirely quantitative. If your system is transductive, it might be much more efficient than Salmonella. In addition, lysogenic Salmonella can be induced (by UV) or aging) to release quite high titres of phage. The more critical experiment is whether lysogenicity is by itself a sufficient, as well as necessary, condition for tox. If not, it will have to be determined whether the efficiency of a given phage prep. depends on its previous history in or on tox. vs. nontox. strains.

Please give Dr. Roman my best (if he's still on campus).

Sincerely,

Joshua Lederberg