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Draft Letter to Nature

Bacterial Sex Factors, Conjugons, and Plasmids

Sir:

The original bacterial sex factor, the F agent of E. coli K12, was discovered because it mediates the transfer of host genes to a recipient cell. Later the term episome was introduced to designate the broader class of units, including both sex factors and temperate bacteriophages, that can replicate either autonomously or as an integrated part of the host chromosome. Since then the plasmid has emerged as an even more fundamental concept: a bloc of DNA, considerably smaller than the chromosome, that is capable of autonomous replication. Members of this class differ from each other, and also can vary in different hosts, in their secondary properties. Thus some are episomal; some can cause formation of a virion that can effect their own transmission and can occasionally transduce host genes; some can cause the formation of a conjugation apparatus that effects their transmission; some of this last class can, but others cannot, mobilize the host chromosome for such transmission; and some minute plasmids may lack all these properties.

Communication in this field is impaired by the lack of convenient terms to differentiate plasmids that cause conjugation from the others, and also to differentiate the two separable functions of conjugation and chromosome mobilization. "Transmissible plasmid" and "non-transmissible plasmid" are unsatisfactory, for both kinds are transmissible by transduction; "autotransmissible plasmid" is too clumsy; and a sex factor that does not transfer host genes hardly fits the evolutionary role of sex. We are therefore proposing to use the term "conjugon" for plasmids that can generate a conjugation apparatus, just as a virus is defined in terms of its capacity to generate a virion. Since rates of integration and conjugation vary widely the term "sex factor" might best be used not as a characteristic for classifying plasmids but only under circumstances where mobilization and transfer of the host chromosome is the focus of the discussion.

The term "conjugon" has been used in the past (1), but without wide acceptance. However, the growing need for such a term seems to justify its revival.

Yours,

1. Luria, S. E. Recent Progr. Microbiol. 8; 604 (1962).