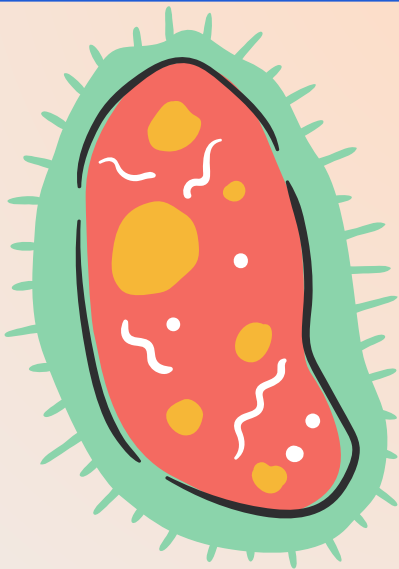


GENE TRANSFER IN BACTERIAL CELL CHAINS

GENE TRANSFER AIDS IN THE EVOLUTION OF NEW TRAITS AND THE ACQUISITION OF NEW TRAITS. HORIZONTAL GENE TRANSFER IN BACTERIA IS FREQUENTLY MEDIATED BY CONJUGATIVE GENETIC COMPONENTS THAT TRANSFER FROM CELL TO CELL.

OVERVIEW

ICEs are found in many bacterial species, including pathogenic, commensal, symbiotic, and nitrogen-fixing bacteria, and they grow in chains, typically as part of microbial communities. It's likely that efficient intrachain spreading is a common feature of conjugative DNA transfer, allowing more cells to receive conjugative mobile genetic elements.



IMPORTANCE

Horizontal gene transmission and the acquisition of new traits are aided by conjugative elements. They are mostly to blame for the spread of antibiotic resistance among microorganisms. Because many bacterial species develop in chains naturally, intrachain transfer is likely a typical way for conjugative components to proliferate faster within microbial communities.

RESULTS

Cells with at least one green were identified as transconjugants. We analyzed previous time points to identify the orientation of the cells during the entire time period leading up to the appearance of transconjugants once a transconjugant was apparent. One transconjugant per 10 to 20 donor cells was identified microscopically as the mating efficiency. Multiple foci in a transconjugant are most likely the result of autonomous ICEBs1 replication in the transconjugant and/or multiple copies transferred from the donor. As a result, the initial transconjugants become donors, and ICEBs1 spreads quickly through cells in chains via effective conjugation.



PREDICTION

Pathogenic, commensal, symbiotic, and nitrogen-fixing bacteria all grow in chains and carry conjugative components. Effective intrachain spreading appears to be a common aspect of conjugative DNA transfer, and it presumably serves to rapidly increase the number of cells that acquire conjugative mobile genetic components. In a pole-to-pole configuration, cells in a chain are in close contact with each other. The high intrachain conjugation efficiency is most likely owing to intimate and stable cell-cell interaction.

REFERENCES