



Simposio Internacional: Evolución por cooperación. La obra de Lynn Margulis (1938-2011)

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Microbiology for the 21st century

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Pathogenic microorganisms do not exist in a vacuum, but rather require appropriate environmental conditions, presence of intermediate hosts or vectors, and, for human pathogens, appropriate social and economic factors that allow for infection. Thus, study of pathogenicity requires interdisciplinary understanding, gleaned from microbiology, epidemiology, protozoology, entomology, ornithology, ecology, hydrology, climatology, ocean sciences, and genetics, to name a few disciplines that are relevant. The web of connections of all these fields, and more, can be defined as biocomplexity. Cholera transmission depends on the causative bacterium, *Vibrio cholerae*, the zooplankton, namely the copepod, that serves as its aquatic host, and environmental factors that affect the host populations, including water temperature, tides, and salinity. More recently, the application of genomics to the understanding of microbial ecology has proven valuable, notably for understanding the epidemics and pandemics caused by *Vibrio cholerae*. More than 100 isolates of *Vibrio cholerae* and related *Vibrio* spp. have been sequenced and their genome sequences analyzed to determine pathogenic properties, lateral gene transfer, and their evolution. The most recent data for *Vibrio cholerae* isolates from the Haitian cholera epidemic will be presented and ecological information linked to the epidemic will be provided.

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