

Abstract

Genera *Leishmania* and *Trypanosoma* are agents of serious human diseases: leishmaniasis and trypanosomózy. For many years these parasites were considered clone-replicating by binary fission as the most protozoa, because there have not been found any convincing evidence of genetic exchange in *Trypanosoma* and *Leishmania*. The research was further impeded the fact that sexual dimorphism of those two generas is not evident and chromosomes do not condensate, therefore are not visible. However, the clonal model started to question the observations of naturally occurring hybrid species. First, the existence of sex reported in trypanosomes by the first direct evidence of *T. brucei* hybrids obtained after transfer of the common parent by tsetse fly. In *Leishmania*, the evidence provided by double-resistant hybrids and sexual meiotic exchange underwent the same process as *T. brucei*. Naturally occurring hybrids in the New and Old World as in the genus *Viannia* and *Leishmania* species have been also observed. The question of the further researches was, what is the mechanism of genetic exchange. The answer is still not clear.

Keywords: genetic exchange, *Trypanosoma*, *Leishmania*, clonality, meiosis, GFP, vector