

Eradication of malaria through genetic engineering: the current situation

ABSTRACT

Malaria is an intra-cellular parasitic protozoon responsible for millions of deaths annually. Host and parasite genetic factors are crucial in affecting susceptibility to malaria and progression of the disease. Recent increased deployment of vector controls and new artemisinin combination therapies have dramatically reduced the mortality and morbidity of malaria worldwide. However, the gradual emergence of parasite and mosquito resistance has raised alarm regarding the effectiveness of current artemisinin-based therapies. In this review, mechanisms of anti-malarial drug resistance in the Plasmodium parasite and new genetically engineered tools of research priorities are discussed. The complexity of the parasite lifecycle demands novel interventions to achieve global eradication. However, turning laboratory discovered transgenic interventions into functional products entails multiple experimental phases in addition to ethical and safety hurdles. Uncertainty over the regulatory status and public acceptance further discourage the implementation of genetically modified organisms.

Keyword: Malaria; Vector control; Resistance; Plasmodium parasite; Genetically engineered tools