



Opinion

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Importance of Further Research on Leishmania Biology

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Diagnosis of Leishmania infection is insensitive and non-specific. Knowledge of Leishmania biochemistry and genetics is very essential. The Leishmania genome size is nearly 34 Mb and chromosomes size range from 0.3 to 2.8 Mb [1, 2]. The Leishmania karyotype is conserved from species of Leishmania and the genes are syntenic [1-4]. The sequence of the smallest Leishmania chromosome was completed in 1998 and 79 protein-coding genes were identified [5]. Recently, one thousand complete genes have been identified from the cosmid sequencing [6]. New molecular tools like regulatable promoter system for analysis of Leishmania biology, will increase our knowledge and help in the prevention and control of Leishmania disease [6]. There is no vaccine that is effective for human leishmaniasis because factors that are involved in the development of specific memory cells for Leishmania and long-lasting immunity are not fully understood until now [7]. Recently, it is unknown how memory cells are developed, persisted and eliminated after Leishmania infection. Long-lasting immunity occurs when there is persistence of live parasites around the areas of infection [8]. Currently, we are able to develop long-lasting immunity when there are no live and reproducing parasites [9]. Vaccine development has two aspects; the first is formulation and second is delivery.

Previous studies indicated that encapsulation of antigens in nanoparticles, liposomes or addition of adjuvants increasingly improves their immunogenicity and ability to prevent [10-12] and this calls the need for further studies to improve vaccine delivery. In future, leishmaniasis could be a global public health problem that can affect people in developed countries. The introduction of a vaccine will prevent an estimated 350 million people who are at risk of Leishmania disease from Leishmania disease in the world [13]. Further studies should be done to identify the mechanisms for persistence of memory cells of Leishmania developed in vivo by booster doses of vaccine made from killed Leishmania parasites. We would like to recommend investors and pharmaceutical industries to do interventional studies for vaccine development. Anthropological research that focuses on gender will be useful to analyze how the effect of communicable diseases vary among men and women and may be used in planning gender-based prevention, strategies.

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