

# A Study on the Current Status of the Available Classic and Molecular Vaccines for the Treatment of Visceral Leishmaniasis

Kajal Varshney and Sabiha Imran\*

Department of Biotechnology, Faculty of Engg. & Technology, Manav Rachna International University,  
Faridabad, Haryana, INDIA

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**Abstract**—Visceral leishmaniasis (VL), synonymously known as ‘kala-azar’ is a chronic disease caused by *Leishmania donovani*. It is a parasitic homoflagellate of the subgenus *Leishmania* which is carried by the sandfly genera *phlebotomus* and *lutzomyia* vectors. It is an obligate intra-macrophage protozoan parasite and is characterized by both diversity and complexity. This parasite infects man and animals. The leishmaniasis is a group of disease caused by protozoan parasites from more than 20 species of *leishmania*. The disease is classified into three main types according to geographic distribution: Indian, Mediterranean (or infantile), and African. This disease represents the second most challenging infectious disease worldwide, leading to, as per WHO report, nearly 200,000 to 400,000 cases occurs annually with 20,000 to 40,000 deaths per year. Life-long immunity to VL has motivated the development of prophylactic vaccines against the disease but very few have progressed beyond the experimental stage. No licensed vaccines till date are available against any form of the leishmaniasis. High toxicity and increasing resistance to the current chemotherapeutic regimens have further complicated the study of leishmaniasis.. The situation has further worsened with the emergence of resistance against this disease. Hence, in the present situation there is an urgent need of the vaccines against VL. There are some approaches against VL which are- molecular, classical and some alternative approaches. Classical approaches comprises whole parasite based vaccine and native protein based vaccine. Alternative approaches provides mutant vaccine and synthetic peptide vaccine. The molecular approaches consists of salivary antigen based vaccine, liposomised vaccine, DNA vaccine, polyprotein vaccine and recombinant protein vaccine. In this paper, we studied and compared the available classical and molecular methods for the identification of potential candidate for vaccine production.