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Developing a multivalent vaccine for lymphatic filariasis – A neglected tropical disease

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Lymphatic filariasis is a mosquito transmitted neglected tropical parasitic infection. Currently more than 120 million people living in 83 different countries worldwide are infected with these parasites. Vast majority of infected people are asymptomatic, but virtually all of them have subclinical lymphatic damage and as many as 40% of patients have severe physical disability with enlarged extremities. There are no vaccines available to control this infection. An effective vaccine will significantly benefit millions of people living in the economically disadvantaged parts of the world. It is well established that certain individuals living in the endemic area are naturally immune to the infection and they carry protective antibodies against the infective stages of the parasite. Utilizing this unique feature, in my laboratory we screened sera samples from these immune individuals with a phage displayed cDNA expression library of the infective stages of the parasites and identified several antigens. Each antigen was then evaluated for their vaccine potential in experimental animals. Based on the findings, we down selected three antigens (a small heat shock protein, abundant larval transcript and tetraspanin) when combined as a multivalent fusion protein, the vaccine conferred over 95% protection against challenge infections in experimental animals. Vaccine induced protection was shown to be dependent on both antibodies (IgG1 and IgG3) and cells (macrophages). We also performed various vaccine dose reduction strategies and show that a single dose of the vaccine is highly effective as a prophylactic vaccine against lymphatic filariasis.

Biography

Ramaswamy Kalyanasundaram completed his Veterinary Medicine (BVSc) degree at the age of 23 years from the Kerala Agricultural University India, Ph.D at the age of 38 years from University of Calgary Canada and postdoctoral studies from Cornell University. He is currently the Head of the Department of Biomedical Sciences at the College of Medicine at University of Illinois. He has published more than 88 per-reviewed manuscripts in reputed journals and serves on several NIH vaccine-related grant review panels.

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