

Ribosomal Protein S4 Gene: Exploring the Presence in Syrian Strain of Leishmania Tropica Genome, Sequencing it and Evaluating Immune Response of pCI-S4 DNA Vaccine

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Abstract : Cutaneous leishmaniasis represents a serious health problem in Syria; this problem has become noticeably aggravated after the civil war in the country. Leishmania tropica parasite is the main cause of cutaneous leishmaniasis in Syria. In order to control the disease, we need an effective vaccine against leishmania parasite. DNA vaccination remains one of the favorable approaches that have been used to face cutaneous leishmaniasis. Ribosomal protein S4 is responsible for important roles in Leishmania parasite life. DNA vaccine based on S4 gene has been used against infections by many species of Leishmania parasite but leishmania tropica parasite, so this gene represents a good candidate for DNA vaccine construction. After proving the existence of ribosomal protein S4 gene in a Syrian strain of Leishmania tropica (LCED Syrian 01), sequencing it and cloning it into pCI plasmid, BALB/C mice were inoculated with pCI-S4 DNA vaccine. The immune response was determined by monitoring the lesion progression in inoculated BALB/C mice for six weeks after challenging mice with Leishmania tropica (LCED Syrian 01) parasites. IL-12, IFN- γ , and IL-4 were quantified in draining lymph nodes (DLNa) of the immunized BALB/C mice by using the RT-qPCR technique. The parasite burden was calculated in the final week for the footpad lesion and the DLNs of the mice. This study proved the existence and the expression of the ribosomal protein S4 gene in Leishmania tropica (LCED Syrian 01) promastigotes. The sequence of ribosomal protein cDNA S4 gene was determined and published in Genbank; the gene size was 822 bp. Expression was also demonstrated at the level of cDNA. Also, this study revealed that pCI-S4 DNA vaccine induces TH1\TH2 response in immunized mice; this response prevents partially developing a dermal lesion of Leishmania.

Keywords : ribosomal protein S4, DNA vaccine, Leishmania tropica, BALB/c

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