VAC.24 - Obtaining immunodominant fractions of Leishmania antigens to compose an intranasal vaccine against *Leishmania (Viannia) braziliensis* infection in the hamster model

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Introduction: This work aims at the technological and innovative development of a non-injectable vaccine against a American Tegumentary Leishmaniasis (ATL), a neglected disease highly endemic in Brazil, leishmaniasis. Previous studies in the murine model demonstrated the efficacy of the intranasal route for the effective release of crude antigens (total lysate of *Leishmania amazonensis* - LaAg promastigotes) and DNA (LACK DNA) in the protection against cutaneous (*L. (L.) amazonensis*) and visceral (*L. (L.) infantum*) leishmaniasis. As most strains of mice are resistant to infection by species of the subgenus *Viannia* (*L. braziliensis* and *L. guyanensis*), the main responsible for cutaneous leishmaniasis in America (LTA), our group recently established the golden hamster *L. braziliensis* model for the study of pathogenesis and vaccine protection for ATL. We demonstrated the effectiveness of the intranasal vaccine with LaAg against infection by *L. braziliensis* hamster model. We have previously evidence that antigens called LVAL (not allowed disclosure - potential of patentability) could induce *in vitro* well modulated response in human cells. Then we hipotesize LVAL antigen could be a vaccine candidate against ATL.

Objective: Thus, this work aims to evaluate the intranasal vaccine efficacy of the LVAL antigen and evaluate the immunological potential of the immunodominant fractions against infection by *L. (V.) braziliensis* in the hamster model. This study is part of a project with license number L7/17, approved by the CEUA/IOC-Fiocruz.

Methodology: Hamsters were immunized with two doses of 20 μg LaAg or LVAL either intranasally or intramuscularly, with a 14-day interval between doses. The control group received PBS. After 14 days of the second immunization, the hamsters were infected on the dorsum of hind paw with 1 x 10^5 promastigotes of *L. braziliensis*. The lesion development was monitored weekly through the morphometry of the infected paw compared to the contralateral paw. Immunoblot methodology was performed to identify immunodominant antigenic fractions of the LaAg and LVAL antigens using serum samples from patients who evolved to cure spontaneous or posttreatment of LTA.

Results: Hamsters vaccinated with LaAg and LVAL intramuscularly were not protected. The percentage of hamsters vaccinated with LaAg and LVAL that were considered protected (nodular lesions less than 1mm thick) was 50% and 43%, respectively, compared to 17% in the control group. Based on the immunoblot analysis, the fractions of the LVAL soluble antigens most frequently recognized by antibodies from sera from cured LTA individuals had molecular weight between 40 and 70 kDa. The molecules related to these bands will be fractionated and characterized biochemically.

Conclusion: The identification and characterization of promising vaccine antigens may contribute to the definition of an active antigenic formulation in the protection against leishmaniasis that may serve for subsequent studies and evaluation of its potential clinical application.

Keywords: vaccine; intranasal immunization; immunodominant fractions