

## **Immunization effect of *Helicobacter pylori* recombinant CagA & LPS formulation in Balb/c mouse model**

Nafiseh Paydarnia<sup>1,2</sup>, Davoud Esmaeili<sup>3</sup>, Tohid Kazemi<sup>1</sup>, Mahyar Aghapour<sup>1,4</sup>, Behzad Baradaran<sup>1\*</sup>

<sup>1</sup>Immunology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>2</sup>Tabriz University of Medical sciences, International Branch (Aras), Tabriz, Iran

<sup>3</sup>Department of Medical Microbiology, Baqiyatallah University of Medical Sciences, Tehran, Iran

<sup>4</sup>Department of Pathobiology, Faculty of Veterinary Medicine, University of Tabriz, Tabriz, Iran

**\*Corresponding author:** Behzad Baradaran, Immunology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. Tel: +98 413 3371440; Fax: +98 413 3371311; E-mail: [behzad\\_im@yahoo.com](mailto:behzad_im@yahoo.com).

### **Abstract**

**Background:** *Helicobacter pylori* is recognized as one of the most common causes of human gastric infection, and about half of the world's population carries this organism. The goal of this study was to determine role of *H.pylori* lipopolysaccharide (LPS) and rCagA as stimulating host immune responses in the context of a vaccine.

**Material and Methods:** In this experimental study, BALB/c mice were immunized with different formulations three times orally followed by two times intramuscularly (IM) at 14-day intervals. The protective effects of two component vaccines plus CpG Adjuvants were assessed before and post-immunization in separate studies. The gene expression of IL-4, IL-10, IL-12 and IFN- $\gamma$  were measured in sera of immunized mice before and post-immunization using RT-PCR test. Moreover, the specific IgG1, total IgG and, IgG2a antibodies in sera were studied by ELISA.

**Results:** Data of western blotting confirmed the presence of produced protein interacted with immunized mice sera. Analysis of lymphocyte proliferation showed that one microgram rCagA increases lymphocytes proliferation compared to control group. Immunization of mice with *H. pylori* rCagA + LPS +CpG induced a strong local and systemic Th1 immune response. The IgG1/IgG2a ratio in the mice immunized with rCagA and LPS plus the CpG adjuvant was <1.

**Conclusions:** Results indicated that recombinant CagA protein not only maintained its antigenicity throughout the experiment, but also induced robust Th1 and Th2 immune responses. Therefore, it holds promise for serological screening of *H. pylori* and production of vaccine.

**Keywords:** Immunization, *H. pylori*, LPS, rCagA, RT-PCR