28th ECCMID EUROPEAN CONGRESS OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES
Madrid, Spain
21 – 24 April 2018

P2178 Bioinformatic studies and assessment the immunogenicity of a truncated fusion protein composed of iron scavenger receptors of Proteus mirabilis as a novel vaccine candidate against urinary tract infection

Mohammad Reza Asadi Karam*[2], Mehri Habibi[1], Saeid Bouzari[2]

[1]Pasteur Institute of Iran, Molecular Biology, Tehran, , [2]Pasteur Institute of Iran, Molecular Biology, Tehran, Iran

Background: Urinary tract infections (UTI) caused by *Proteus mirabilis* strains are among the most bacterial infections in humans. Increase in antibiotic resistance will complicate future treatment of the infections, making the development of an UTI vaccine more urgent. Iron scavenger receptors have important roles in pathogenicity of *Proteus mirabilis*. There are little studies about the efficacy of iron scavenger receptors as vaccine candidates against UTIs. Thus, in this study we decided to design a truncated fusion candidate of iron scavenger receptors PMI0842 and PMI2596 by bioinformatics studies and evaluated the immunogenicity of this candidate in mice model.

Materials/methods: In this study, the sequences of iron scavenger receptors of *P. mirabilis* were evaluated by bioinformatics studies. Then, the selected fragments of the iron receptors were amplified and cloned into the pET28a vector. This fusion gene was expressed in BL21 host and purified by nickel resins. The analysis of the purified protein was performed by SDS-PAGE and Western blot. Mice were intranasally vaccinated with this purified protein. Then, serum and urine samples were collected for assessment the IgG and IgA responses by ELISA. Furthermore, the cytokine secretion was measured in the splenocytes of vaccinated mice.

Results: According to the bioinformatics analyses, the best fragments of iron scavenger receptors were selected. The expressed purified protein showed band at the size of approximately 45 KD. The fusion protein significantly induced humoral responses (IgG and IgA) in serum and urine of mice than the control mice received the PBS (P<0.05). We found the fusion protein increased the levels of cytokines IFN-γ and IL-4 in the immunized mice than control. Based on the IgG1/IgG2a and IFN-γ/IL-4 ratios, fusion protein tended to direct the immune responses towards both the Th1 (cellular) and Th2 (humoral) responses.

Conclusions: Outer membrane antigens of *P. mirabilis* such as iron scavenger receptors are good vaccine candidates because they are antigenic, expressed *in vivo*, and are exposed on the surface of the bacterium. Thus, in this study, a fusion candidate of iron scavenger receptors was designed for the first time that showed promising results in animal model that needs to further studies.