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Promoting isotype switching to IgG2c by IFN-γ, Is a key factor to overcome GAS infection in mice

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Introduction

Group A streptococcus (GAS) is a prevalent human pathogen, causing more than 700 million cases of mild infections annually and around 500 thousand annual deaths in the world. GAS is the cause of different human diseases, ranging from pharyngitis to autoimmune diseases. One of the most well-known virulence factors in GAS is M protein, a surface protein that facilitates bacterial invasion.

Methodology

In this study, we used a recombinant GAS strain (GAS2W) expressing M protein containing a hyper immunogenic peptide (2W). Mice were immunized three times with heat killed-GAS subcutaneously with three weeks interval. Three weeks post last immunization, mice were challenged intraperitoneally with a lethal dose of live-GAS.

Result

In order to investigate the impact of IFN-γ and antibodies in protection against GAS infection, we used a mouse model knock-out for IFN-γ (IFN-γ KO). We observed immunization with GAS2W strain can increase protection against GAS infection in mice compared with the original GAS strain. Higher levels of antibodies against M1 protein were measured in GAS2W-immunized mice. There was also a significant increase in IgG2c response in mice immunized with GAS2W. By using IFN-γ KO mice we showed that not a high level of total IgG, but IgG2c was correlated with protection through the i.p challenge. It also emphasizes the importance of IFN-γ cytokine to combat GAS by isotype switching to IgG2c (which is opsonic for phagocytosis).

Conclusion

Our data indicate the crucial role of IFN-γ in the protective immune response that together with IgG2c can induce protection against GAS.

Publications

1. Emami, Shiva & Eftekhar, Fereshteh. (2015). The Correlation Between Biofilm Formation and Drug Resistance in Nosocomial Isolates of Acinetobacter baumannii. Avicenna Journal of Clinical Microbiology and Infection. 2. 10.17795/ajcmi-23954

2. Emami, Shiva & Eftekhar, Fereshteh. (2015). The Correlation Between Biofilm Formation and Drug Resistance in Nosocomial Isolates of Acinetobacter baumannii. Avicenna Journal of Clinical Microbiology and Infection. 2. 10.17795/ajcmi-23954.

Biography

I am Shiva Emami, a PhD student who recently finished the third year of her study. I am working with Group A streptococcus in Lund University, Sweden, under supervision of Bengt J. Lindbom and co- supervision of Jenny Persson. I studied master in the field of microbiology, Shahid Beheshti University, Tehran, Iran. I also worked as a research assistance for one year in Iran and 6 months in Sweden, before starting my PhD and I gained lots of experiences during that time. Since I was very interested in Immunology, I started my PhD in the field of Adaptive Immunology with a focus on immunity to infectious disease.

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