Ioana Manea, J Infect Dis Ther 2018, Volume 6
DOI: 10.4172/2332-0877-C6-053

Chicken immunologically active proteins for the development of anti-idiotypic vaccines

Ioana Manea
Activeimmunity srl, Romania

Introduction: According to Jerne's network theory, antibodies contain in their variable region a representation of the 'universe' of antigenic structures, the idiotype. It is possible to induce antibodies against the antigen-binding site of other antibodies (2-6); these new antibodies, called anti-idiotypic (Ab2B), can be used to manipulate the immune system (1,5,6). They have been successfully used in the induction of humoral immune responses against several antigens including bacteria and viruses (2,3,5,6). Chicken Immunologically Active Proteins [CIAP] including Immunoglobulin (Ig)-Y, that are produced by immunizing chickens, have further advantages compared with mammalian IgG (1,2,5,6). This study investigates the use of the chicken and egg system for the development of an immune response against antimicrobial resistance (AMR) bacteria.

Methodology: Stage I: Brown leghorn chickens were immunized with I-spga immunogen which contained antigens from more than 20 inactivated AMR bacteria. Indirect ELISA was used to measure anti-bacterial antibody titers in the watery soluble fraction of eggs up to 14 weeks after the third immunization. Stage II: chicken groups have been formed that have individually consumed yolk or white egg from either hiperimune eggs or from eggs produced by unimmunized chicken. At the end of the experiment, presence of antibodies against original AMR bacteria was checked by ELISA in blood samples and eggs of birds used in the Stage II of the experiment.

Results: Antibodies against AMR bacteria were detected only in the blood and eggs of chicken that consumed hiperimmune eggs; these antibodies inhibited the growth of AMR bacteria in vitro.

Conclusion: The results of this study suggest that eggs from immunized hens could be considered as a CIAP source in the management of AMR infections. The chicken and egg system is a potential and novel approach for the development of anti-idiotypic vaccines that could prove useful in the treatment of microbial infections.

Specification	Chicken Immunological Active Proteins[b]			
	IgY	Ovotransferin	Ovoalbumin	Ovomucin
Pseudomonas aeruginosa	5/5[a]	5/5	5/5	2/2
MRSA	5/5	5/5	5/5	2/2
Klebsiella pneumoniae	5/5	5/5	5/5	2/2
Candida albicans	5/5	5/5	5/5	2/2

d) Positive/tested
e) Direct ELISA assay

Specification	Chicken Immunological Active Proteins[b]				
	IgY	Ovotransferin	Ovoalbumin	Ovomucin	Lisisim
Pseudomonas aeruginosa	14/14[a]	14/14	14/14	8/9	7/7
MRS A	14/14	14/14	14/14	10/10	4/7
Klebsiella pneumoniae	14/14	14/14	14/14	10/10	4/7
Candida albicans	15/15	14/14	14/14	10/10	ND[b]

a) Positive/tested
b) ND: not done
c) ND: not done

Recent Publications:

1. Vaillant et al., The Chicken and Egg System for the Development of Anti-Idiotypic Vaccines. J Vaccines Vaccin. 2012, 3 : 2-4.
2. Schade R, Pfister C, Italatsch R, Henklien P. Polyclonal antibodies from chicken egg yolk-an alternative to the production of mammalian IgG type antibodies in rabbits. ATLA. 1991, 19: 403-419.
3. Jerne NK. Towards a network theory of the immune system. Ann Immunol. 1974, 125: 373-389.
4. Justiz Vaillant AA, Akpaka PE, Smikle M, McFarlane-Anderson N. In vitro Inhibition of Staphylococcus aureus Isolates by Anti-Anti-Idiotypic Antibodies to Staphylococcal Protein (SpA). J Vaccines Vaccin. 2012, 3: 127-131.
5. Patrascu Ionel Victor. Active immunity by passive immunity. 2017 Annual Session of the Romanian Academy.
6. Pătrașcu Ionel Victor. Active immunity by passive immunity. I-spga as a new Immunogen. A Modest Contribution to the Fight Against the Antimicrobial Resistance. SDG Lab, Davos, January 24, 2018, World Economic Forum Annual Meeting, 23-26 January 2018, Davos-Klosters, Switzerland, Media Tenor Global Agenda Index :33.

Biography

Ioana Manea is having more than 20 years of clinical practice. The complicated cases of frail patients with debilitating pathologies including infections with antimicrobial resistance (AMR) germs that he encountered during his clinical practice fueled his interest in the collaboration with scientists developing chicken imunologically active protein (CIAP) products.

Notes: