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Antibody therapy to curb gastroenteritis

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As a tropical country, India is suitable for poultry farming, which is witnessing an increase in demand year after year, thereby attracting many challenges associated with bacterial infections caused by Salmonella sp and E.coli. Unfortunately, poultry meat is one of the major sources of food borne bacterial infections in humans, which are controlled by administering antibiotics. But, the increasing antibiotic resistance among bacteria emphasizes the need for alternative methods for combating pathogens.

Passive immunization by oral administration of egg yolk antibody (IgY) is an effective approach to control infections in poultry. Considering the need, T Stanes and Company and PSG College of Arts and Science (PSG CAS), both based in Coimbatore district of Tamil Nadu, joined hands to raise chicken egg yolk antibodies (IgY) against bacterial pathogens causing gastroenteritis.

For this project they received the financial aid from Small Business Innovation and Research Initiative (SBIRI) of DBT, and was successfully considered for phase I support at a total cost of Rs 61.34 lakh for two years. The amount of funding approved by DBT to T Stanes and Company was Rs 17 lakh with equal contribution by the company, along with a grant of Rs 30 lakh being awarded to the institute.

The project was carried out by transferring the antibodies from hen to chick through the latent stage of the egg, which played an important role in immunological function for the relatively immune-incompetent chick to resist various infectious diseases. These antibodies are extracted, purified and used for passive therapy. The binding of IgY to bacterial cells causes structural alterations, which may impede adhesion of bacteria to epithelial cells; a factor that is essential for establishing infection. The antibody formulations and delivery systems, which would be the products of this proposed project work is a step towards control of the extensive use of antibiotics against microbial infections.

The foundation for this project was based on the technology nurtured by Dr A Michael, principal investigator, head,

Department of Microbiology, PSG CAS, Coimbatore. While the standardization of the antigen dose, generation and purification of the specific antibodies against major gastrointestinal infections was executed at T Stanes and Company, the conversion of the extracted antibodies into a suitable form of administration was carried out at the institute. The stability and reactivity of the antibodies generated were analyzed by both the partners.

The initial antibody therapy trials have shown great promise in effectively controlling the infections against bacterial pathogens in chickens. The project is expected to be completed in August 2013, before drawing final conclusions about the applicability of this concept for poultry industry.

Speaking on the importance of public private partnerships, Dr K Latha, project coordinator, T Stanes and Company, said, "Development of technologies and products in the field of healthcare, agriculture, dairy and farm sector, with constant innovations and most needed improvements are effective with collaborative research, as it also includes tech-economics, feasibility and applicability of the product. Public private partnerships help to fill the gap between research and commercialization."