

## **Immunotherapy of Brucellosis in cattle developed at vet varsity in Ludhiana**

Brucellosis is an important zoonotic disease worldwide caused by the bacteria of various species of *Brucella* organisms. It causes abortions and reproduction disorders in cattle, buffaloes, goats and sheep and can affect pigs, dogs, camels and several other animal species as well as humans. This disease causes production losses worth about Rs. 25,000 Crores annually in India alone. Affected animals become carriers for the rest of their lives and spread infection to other animals. Presently, there is no cure for Brucellosis and the available antibiotics as well as the vaccine currently being used in India have not been able to control the disease.

Scientists at Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana have developed a novel immunotherapy for bovine Brucellosis which has been shown to cure Brucellosis in adult cows in three months with a single injection of the new therapeutic vaccine. The findings of the study have been published in the April 2018 issue of PLoS Neglected Tropical Diseases and can have profound implications for Brucellosis control in developing countries, particularly in India where slaughter of cattle is not permitted. The breakthrough is the brainchild of Dr. Hari Mohan Saxena, Professor of Immunology in the Department of Veterinary Microbiology at GADVASU, Ludhiana meticulously executed by Ms. Sugandha Raj, a MVSc student under his supervision.

A cocktail of vaccine strain organisms S19 and RB51 of *Brucella abortus* bacteria killed by a bacteriophage was used as therapeutic vaccine. Brucellosis affected cows were injected 2 millilitres of this lysate under the skin once. The treated cows were monitored fortnightly over a period of three months employing a *Brucella* specific molecular biomarker. The therapy eliminated live virulent *Brucella abortus* organisms from the cows as indicated by progressive reduction and ultimately complete absence of the biomarker in the blood by 90<sup>th</sup> day after the treatment.

The novel immunotherapy and its non-invasive monitoring through the molecular biomarker have been successfully employed for the first time. The principle behind the biomarker based non-invasive monitoring, a spin-off innovation of the therapeutic vaccine research, has vast potential and can be applied for evaluation of different kinds of new antimicrobial treatments in animals and humans accurately and cost-effectively, drastically reducing merciless killing of laboratory animals currently in vogue. There is a dire need of such new alternative therapies for infectious diseases in view of the alarming rise in microbial resistance to antibiotics and other antimicrobial agents worldwide. Furthermore, the prevention of losses due to infectious diseases through alternative therapies could lead to significant increase in the income of the livestock owners and farmers.