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Ostertagiosis and *Ostertagia ostertagi* interactions with the bovine host

Statement of the Problem: Parasitic nematodes are able to cross-regulate host immunity, evade immune surveillance, favoring their own survival. This is in part accomplished by producing bioactive molecules possessing potent immunoregulatory roles. *Ostertagia ostertagi* is a nematode parasite specifically infecting the gastric glands of the abomasum (4th stomach) of cattle. This most important parasite is highly prevalent in temperate regions worldwide and causes sustained production losses to the cattle industry. Gastrointestinal parasite control heavily relies on the use of anthelmintics; however, drug resistance is rapidly emerging and requires development of alternatives to drug control.

Methodology & Theoretical Orientation: Parasitic immune modulators were investigated by homologue search in the parasitic transcriptome and molecularly cloned/expressed/purified, and functionally characterized.

Findings: Upon infection with *O. ostertagi*, significant immune responses were readily detectable in the abomasum and its draining lymph nodes as early as day 3 post infection. However, host resistance to infection was not generated until after repeated infections. A number of parasitic immune modulators such as macrophage migration inhibitory factor (MIF) and

annexins were identified some of those were developmentally regulated and possessed active functions cross-regulating bovine host immune responses. Results suggested that immunosuppression mediated by parasitic immune modulators may be a mechanism by which the parasite evades host protective immunity.

Conclusion & Significance: Investigation of the host-parasite interaction, particularly immunomodulation mediated by parasitic-derived immune modulators, will aid in further understanding host-parasite interactions, host response to infection and parasite evasion, and facilitate the development of immunological control measures.

Speaker Biography

Wenbin Tuo has expertise in protozoan and nematode parasite infectious diseases in livestock species. He has devoted his professional career to understanding host-parasite interactions and development of immunologic control measures for parasitic infections in large ruminants. Vaccine candidates identified by antigen-specific CD4 T cells and parasitic immune modulators that are able to cross-down-regulate host protective immunity have been tested in numerous vaccine trials and some of the vaccines have been demonstrated to have significant protective efficacies. His ongoing research involves continued investigation of interplays between the parasites and hosts and identification and testing of protective candidate vaccines in ruminants.

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