
ID der Kurzfassung : **302**

# Magnetic bioprinted granuloma: a three-dimensional model for cattle tuberculosis

## Inhalt

Tuberculosis (TB) continues to represent a significant global health concern, impacting both humans and livestock. *Mycobacterium bovis* is the causative agent of bovine TB, an important zoonosis, whereas *Mycobacterium tuberculosis*, an organism adapted to humans, can occasionally cause symptomatic infection in cattle. The formation of granulomas, defined as organized multicellular tissue lesions, has been identified as a hallmark of TB in all affected host species. We developed a three-dimensional granuloma model, termed in vitro granuloma-like structure (IVGLS), using bovine leukocytes and magnetic nanoshuttles. Stable IVGLS were bioprinted to resemble either TB granulomas at innate stage, composed of macrophages, or the adaptive stage, containing also lymphocytes. *M. bovis* Bacillus Calmette-Guérin (BCG) replicated within the IVGLS, inducing foamy cell formation and triggering apoptosis particularly in the presence of lymphocytes. IVGLS released chemokines and Th1 cytokines and rewired their metabolism towards glycolysis. Cattle IVGLS recapitulate features of TB granulomas and facilitate spatial mapping of the immune responses.

## Keywords

tuberculosis, mycobacteria, cattle, model, immunity, granuloma

## Registration ID

OHS25-152

## Professional Status of the Speaker

Professor

## Junior Scientist Status

No, I am not a Junior Scientist.

**Track Klassifizierung:** Vaccines & Immunology

**Typ des Beitrags:** Oral presentation