

First National Tuberculosis Conference at CIDR

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Photograph: Uchenna Watson

The Centre for Infectious Disease Research (CIDR) hosted the first National Tuberculosis Conference on 19 December 2016. The one-day symposium was aimed at addressing the pressing issue of control of tuberculosis (TB), an infectious disease that is one of the top 10 causes of death worldwide, particularly acute in India.

The causative agent of TB, *Mycobacterium tuberculosis* (*Mtb*), was identified over 150 years ago. But controlling TB is a challenge because of the miniscule bacterial population that fails to respond to drugs. The host environment—macrophages, which are the primary target of infection by *Mtb*, and granulomas that form the foci of infection in the lungs—alters the capacity of the pathogen to withstand treatment and protects it from host immune defences. The invited lectures of the day propounded disparate measures to gain insights into bacterial physiology and, more importantly, the milieu in which the organism exists within its human hosts.

Sheetal Gandotra (Institute of Genomics and Integrative Biology, New Delhi) spoke about the environment in these host niches. With *Mtb* primarily surviving on host lipids for its metabolic needs, Gandotra's group uses fat cells or adipocytes as a model to answer key questions about the metabolism of the pathogen within the host, and the regulation of bacterial genes crucial for sustaining infection. Other speakers addressed how *Mtb* infection influences its host. Studies from KN Balaji's lab at IISc, indicate that the epigenetic modulation of host immune response, in terms of lipid-loaded or "foamy" macrophage formation that allow for bacterial persistence, is brought about by bacterial factors. More concrete evidence was presented by mammalian geneticist Sanjeev Khosla (Centre for DNA Fingerprinting and Diagnostics, Hyderabad), whose team studies the direct interaction of secretory mycobacterial proteins with host cell chromatin network, leading to repression of genes involved in the host immune response. Vikas Jain (Indian Institute of Science Education and Research, Bhopal), introduced "new generation therapeutics" to the audience—myco-bacteriophages, or viruses infecting *Mtb*. In this technique, viral gene expression is engineered to produce endolysins that provide a wide spectrum of anti-microbial activity.

The latent bacterial burden in humans and the fact that infections relapse are major impediments in the path of the World Health Organisation (WHO) initiative of completely ridding the world of the disease by the year 2050. In her opening address, Soumya Swaminathan, Director General of the Indian Council of Medical Research (ICMR), spoke of how an exchange of ideas was necessary to make this happen, saying, "I see a room full of young people—TB researchers—and this is exactly what we need."

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