The first "Mycobacteria a challenge for the 21st Century" international congress

The first **"Mycobacteria a challenge for the 21st Century"** international congress was organised by the Universidad Nacional de Colombia in Bogotá. The conference allowed national and international experts in the field of public health and basic research to gather together and discuss the threat posed to human hosts by infections caused by members of the mycobacterium genus. The meeting brought together 43 speakers from 13 countries (Argentina, Belgium, Brazil, Denmark, Spain, the USA, France, Italy, Mexico, the Netherlands, Peru, Switzerland and Venezuela) along with 40 Colombian scientists working on mycobacteria.

Today, reverse genetics allows selected genes to become inactivated, thereby allowing the molecular basis of *M. tuberculosis* pathogenesis to be studied. One of the pioneers in this field, W. Jacobs Jr. (Albert Einstein College of Medicine, USA), gave three outstanding talks on the power of genetics in mycobacteria as a promising path towards novel chemotherapy and immunotherapy aimed at treating TB. C. Martin (Universidad de Zaragoza, Spain) presented evidence regarding PhoP as a regulator of major changes in *M. tuberculosis* morphology, in secreting the major ESAT-6 T-cell antigen and its importance for pathogenic lipid synthesis. His findings have indicated that PhoP orchestrates a variety of functions implicated in *M. tuberculosis* intracellular style of life. I. Smith (PHRI Center, UMDNJ-New Jersey Medical School, USA) presented data suggesting that sigma factor SigE directly controls intracellular survival and host inflammatory response against *M. tuberculosis* in macrophages. M. Rodriguez (UMDNJ New Jersey Medical School, USA) provided evidence that IrtA and IrtB (two membrane proteins belonging to the ABC transporter family) are required for iron uptake and normal replication of Mtb in macrophages and mice.

The search for faster new methods for analysing TB transmission than the current IS6110-RFLP method is becoming fruitful. Dick van Soolingen (National Institute for Public Health, the Netherlands) and N. Rastogi (Institut Pasteur de la Guadeloupe, Guadeloupe) showed how spoligotyping and MIRU-VNTRs have now been adopted for large-scale, high-throughput *M. tuberculosis* genotyping. An updated version of this technique (SITVIT2) has been expanded to integrate both spoligotyping and MIRU-VNTRs data from 233 contributors and spoligotyping patterns for 62592 isolates from 151 countries of origin are available nowadays.

The field of emerging non-tuberculous mycobacteria was covered by F. Porlaels, J. de Waard and E. Tortoli. F. Portaels (Institute of Tropical Medicine, Belgium) presented recent intriguing discoveries concerning aquatic insects which have been considered potential passive reservoirs or vectors of *M. ulcerans* (the aetiologic agent for the Buruli ulcer). Knowledge about drug resistance is related to developing new drugs, new diagnostics methods and better control of TB-MDR expansion. P. Almeida (Universidade Federal do Rio Grande, Brazil) illustrated mutations in *katG*, *emb*B and other genes responsible for the MDR phenotype; H. Takiff (IVIC, Venezuela) discussed fluoroquinolone resistance mechanisms and J.C. Palomino (Institute of Tropical Medicine, Belgium) presented an update of the latest developments in TB diagnosis and drug resistance detection, both by using phenotypic and genotypic methods.

Molecular events occurring while *M. tuberculosis* resides inside phagocytes were addressed from different perspectives. J. Peters (University of Basel, Switzerland) presented molecular evidence suggesting that *M. tuberculosis* blocks intracellular degradation and guarantees mycobacterial survival inside macrophages by hijacking host signal transduction mechanisms. The paramount importance of host innate immune responses in dealing with mycobacteria was thoroughly covered by a group of talented speakers. H. Kornfeld, (University of Massachusetts Medical School, Worcester USA) and M. Rojas (Universidad de Antioquia, Colombia) lectured on pathways and the consequence of phagocyte cell apoptosis during M. tuberculosis infection. C. Espitia (UNAM, Mexico) and L. Schlesinger (Ohio State University, USA) illustrated the importance of C-type lectin PRRs on *M. tuberculosis* adaptation to macrophage intracellular milieu. R. Modlin, (UCLA, USA) presented data clearly supporting a link between TLRs/vitamin D and innate anti-mycobacterial immunity in humans.

Two basic research symposia during the congress were devoted to adaptive immunity mechanisms and the newest achievements in vaccine development. Keynote lectures by E. Unanue (Washington University, USA) and M. Brenner (Harvard Medical School, USA) on seminal new concepts regarding antigen presentation were followed by those of J. Flynn (University of Pittsburgh School of Medicine, USA) and R. Hernandez-Pando (Institute of Medical Sciences and Nutrition "Salvador Zubiran", Mexico) on new animal models for studying TB. J.L. Casanova (University of Paris, France) presented unpublished data on a new gene (germline but macrophage-tropic CYBB mutation) predisposed to mycobacterial diseases in humans. L.F. Garcia (Universidad de Antioquia, Colombia) presented results regarding RD1 antigen-specific cellular immune response follow-up in a large cohort of individuals suffering from TB and household contacts from Medellin, Colombia. Different informatics' approaches to reverse genetic means orientated towards discovering new immuno-prophylaxis tools against *M. tuberculosis* were addressed by M.A. Patarroyo (FIDIC, Colombia) and W. Jacobs Jr. (Albert Einstein College of Medicine, USA). Efforts towards improving BCG vaccine performance was covered by R. Billeskov (Staten Serum Institute, Denmark), together with interesting data from new vaccine candidate clinical trials by C. Martin (University of Zaragoza, Spatin) and M. Horwitz (UCLA, USA).

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