European researchers identify a mechanism of protection of the new tuberculosis vaccine MTBVAC

- The immune response to two dominant TB antigens present in MTBVAC but absent in BCG, is associated with the enhanced protection of MTBVAC as compared to BCG
- The discovery warrants further exploration of this immune response as a potential correlate of protection

14 July 2017. Researchers at the University of Zaragoza (belonging to CIBERES) and the biopharmaceutical vaccine company Biofabri in Porrino, Spain, are in partnership with the TuBerculosis Vaccine Initiative (TBVI) developing a new TB vaccine, MTBVAC. MTBVAC, a live attenuated *M.tuberculosis* vaccine, has been shown to provide improved protection as compared to BCG and the mechanism behind this greater efficacy has been hypothesized to be due the ability of MTBVAC to present a wider collection of antigens of *M. tuberculosis*. In a recent study by Aguilo *et a*l (Nature Communications 8:16085), the University of Zaragoza provides the first evidence for this hypothesis through the discovery that two *M. tuberculosis* antigens of MTBVAC, ESAT-6 and CFP-10, which are both not present in BCG, are key contributors to the superior protection that is induced by MTBVAC in mice. Furthermore, through a collaboration with researchers at the Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland, the study describes that also in humans MTBVAC (but not BCG) triggers a specific immune response against ESAT6 and CFP10. The findings uncover a first mechanism of the improved protection of MTBVAC as compared to BCG, and further exploration of this response as a potential biomarker of protection for MTBVAC is warranted.

MTBVAC is an attenuated live attenuated *M. tuberculosis* vaccine designed and constructed by the research groups of Carlos Martin of the University of Zaragoza and of Brigitte Gicquel of Institut Pasteur in Paris. Biofabri manufactures MTBVAC as a live attenuated freeze dried vaccine and aims in partnership with TBVI to license MTBVAC as a vaccine to prevent tuberculosis in adults and neonates. A phase 1 study in healthy adults carried out by CHUV in Switzerland has been completed in 2015, and a phase 1b study in neonates by South African Tuberculosis Vaccine Initiative (SATVI) in South Africa is being finalised in 2017. A subsequent phase 2a study in neonates in South Africa is aiming for a start in early 2018.

Tuberculosis (TB) remains a major global health challenge with an estimated 10.4 million new cases and 1.8 million deaths annually. BCG, the only current vaccine against TB is

only partly effective and a new more effective vaccine is essential in any strategy aiming to eliminate TB, and to halt the increasing incidence of drug resistant TB.

The University of Zaragoza is a public higher education and research institution in the service of society with more than 500 years of history. Its objective is to create and transfer knowledge, to provide comprehensive training for all. It is a supportive and open university that aims to be an instrument of social transformation and to promote economic and cultural development. Tuberculosis vaccine is patented by the University of Zaragoza and Biofabri is the exclusive licensee of MTBVAC.

Biofabri, S.A., is a biopharmaceutical company established in the year 2008 in Porriño, Spain, that focuses on research, development and manufacturing of vaccines, medicines and other products for human health. MTBVAC is among the most advanced candidates in the vaccine portfolio of Biofabri. Biofabri aims to license MTBVAC as a vaccine that will prevent tuberculosis in adults and neonates.

TBVI, the TuBerculosis Vaccine Initiative, is an innovation partnership that works to discover and develop new TB vaccines. It consists of two interdependent arms – the TVBI R&D Partners and the TVBI Organization. Most of the R&D Partners - currently more than 50 - are based in Europe, while the Organization is a non-profit foundation based in the Netherlands.

Reference article:

Reactogenicity to major tuberculosis antigens absent in BCG is linked to improved protection against Mycobacterium tuberculosis

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