Abstract

It is now known that the existing vaccination, Bacille Calmette-Guérin (BCG), is unable to stop the global Tuberculosis (TB) epidemic, and TB continues to pose a serious threat to public health [1]. Mycobacterium tuberculosis (Mtb), the causing agent, enters the body by inhalation, causing TB predominantly a respiratory infection [1]. Therefore, there is solid evidence to support the idea that a mucosally administered TB vaccination would be more successful than one administered systemically. Our team in Universiti Sains Malaysia (USM) has been working with several organisations in conjunction with Malaysia’s National Vaccine Roadmap (PPVN) to address this problem as well as the government’s goal to produce vaccines that are high-quality, efficient, and secure following the guidelines established by the National Pharmaceutical Regulatory Agency (NPRA).

Therefore, the development of TB mucosal vaccines over the past few years for worldwide as well as in USM is outlined in this presentation. It aims to discuss immunological and practical factors in the development of mucosal vaccines and emphasises some of the current and future approaches in USM. As a result, it is acknowledged globally that matching the path of infection with the path of immunisation is an appealing strategy for the development of TB vaccines. Several approaches have been made in USM to produce a vaccine candidate that significantly induces mucosal immunity. The design of the study showed the manipulation of IgA, which is a hallmark of mucosal immunity, with multi-epitopes of TB to produce IgA:TB recombinant protein by using goat’s milk as a bioreactor. The concept of oral immunisation in-vivo also is an important approach in our effort to maximise the production of the immune system at the point of entry of bacteria.

In a conclusion, as a boost to a prior respiratory or systemic immunisation, the mucosal method might be more effective. In addition to systemic immunity obtained by injected vaccines, vaccines to induce pathogen-specific IgA are being developed to provide a first line of defence at these entry sites. Therefore, combining these concepts into developing new recombinant vaccine against TB would be a promising alternative.

Keywords
Tuberculosis, Oral immunisation, Mucosal vaccines
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