Utilizing Tuberculosis-Recognizing Antibody Serum in order to Identify Specific Tuberculosis Antigens to Fabricate a Novel Vaccine

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The primary focus of this research was to identify tuberculosis proteins recognized by guinea pig antibodies and their origin within the tuberculosis bacterium. Tuberculosis is one of the top ten causes of death worldwide, and there has been a rise in multi-drug resistant strains, necessitating an effective vaccine as a preventative measure. Tuberculosis is treatable with a strict regimen of antibiotics, but this treatment is expensive and arduous, especially for those afflicted in developing countries. The current vaccine, bacillus Calmette-Guérin, varies widely in its effectiveness from 0-80%, requiring a novel vaccine. This research identifies the specific antigens of the tuberculosis bacterium in which to compose an alternative vaccine from. It consisted of a series of Western Blots to discern which antigens were recognized. Antibodies from the immune system of guinea pigs infected with tuberculosis were used and, as a control, compared to antibodies from guinea pigs that were not infected. In addition, different lysates of tuberculosis from the cell wall to the cytosol were used to determine the origin of the recognized antigens. The origin of the specific antigens was from the cell wall, and their molecular weight ranged from 25-37 kDa. The images from the controls that used the naïve serum did not demonstrate any compelling evidence of recognition. In future experimentation, these antigens from the tuberculosis bacterium will be isolated, used to compose a vaccine, and have its effectiveness be tested. This aids in the eradication of tuberculosis, a humanitarian issue and a priority of the WHO.

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