

RECOMBINANT BCG EXPRESSING SECRETED ANTIGENS FOR THE DEVELOPMENT OF NEW VACCINES AGAINST COVID-19

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COORDINATOR

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RESEARCH AREA

Prevention and Reduction of Contagion

DEVELOPMENT STAGE

Level 4 - TRL - Component and/or breadboard validation in laboratory environment.
MRL - Capability to produce the technology in a laboratory environment

PROPOSITION / APPLICATION

The technical problem and application addressed in the present project are based in the publication listed below (1), which suggests the use of recombinant BCG expressing peptides or proteins from SARS-CoV-2 as a vaccine, thus exploring BCG's known adjuvant qualities and its capacity to induce trained immunity. The research group, which has accumulated technical expertise in the manipulation of mycobacteria, proposes to assemble BCG constructs expressing SARS-Cov-2 proteins or peptides, and to provide these constructs to interested groups or companies. The BCG strain to be used is the BCG Moreau strain, which has already been subject to patent protection by Fiocruz in other projects, added with an expression cassette that allows the expression and secretion of a SARS-Cov-2 antigen.

(1) Gupta PK. New disease old vaccine: Is recombinant BCG vaccine an answer for COVID-19? 2020. Cellular Immunology 356: 104187
(<https://doi.org/10.1016/j.cellimm.2020.104187>)

INNOVATION

The innovation refers to the production of recombinant BCG strains capable of expressing and secreting antigens from SARS-Cov-2, associating the immunomodulatory qualities of the BCG vaccine to the delivery of protective antigens from SARS-Cov-2, enhancing its vaccine efficacy.

OPPORTUNITY

(1) It is expected that the vaccine effect will be enhanced by the characteristics already described for BCG as a non-specific inducer of trained immunity. (2) The BCG vaccine, in this case, would be used to prevent COVID-19, since it would be a recombinant strain capable of expressing SARS-CoV-2 antigens in secreted form. (3) The proposal provides for the expression of recombinant antigens using the BCG Moreau vaccine as a host. The use of a specific DNA sequence for genetic identification of the BCG Moreau strain has already been protected through the patent institute in Brazil. It is a service offering that aims to provide a recombinant BCG construct capable of expressing and secreting a specific antigen derived from SARS-CoV-2, to be supplied to groups interested in the evaluation of its protective potential.

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