Confirmation of the expression of the S protein (Spike) by the viral chimera YFV-S

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SARS-CoV-2 is a single-stranded, positive-sense RNA virus, enveloped, and with a non-segmented genome, spanning approximately 30 kb. Among its structural proteins, the primary one is the spike protein (S), responsible for recognizing and mediating the virus's binding to cell receptors. Furthermore, the S protein can be recognized by antibodies and elicit an immune response to this structure. Due to these factors, this protein is the primary target in the production of vaccines and antivirals for the disease caused by this virus. Therefore, in this project, with the aim of developing a new vaccine against SARS-CoV-2, the genetic framework of YFV-17D, an attenuated viral strain that is well-established and safe, was utilized. It was tested through assays like Western blotting to determine if the inserted protein of interest is being expressed by the chimeric virus, and then proceeded to the next steps. To accomplish this, a chimeric YFV-17D virus was constructed carrying the insertion of the SARS-CoV-2 S protein in the intergenic region E-NS1 of YFV-17D. Additionally, an epitope from the S1 domain of the S protein was also added in a region within the YFV-17D E protein called LopFG. The resulting plasmid from the construction was linearized with a restriction enzyme, and the viral RNA was transfected into Vero cells. After observing the cytopathic effect, the supernatant was collected, and a viral stock was prepared. Subsequently, to confirm the expression of the protein of interest (S), YFV-S was characterized by Western blotting. The result of this experiment confirms the expression of the S protein by the chimeric YFV-S virus, revealing its significant potential in the production of a new vaccine against SARS-CoV-2.

Key word: Vaccine; Virus; SARS-CoV-2; Spike.

Confirmação da expressão da proteína S (Spike) pela quimera YFV-S

Neste trabalho o objetivo é desenvolver uma nova vacina contra o SARS-CoV-2, utilizando uma cepa viral viva e atenuada da YFV-17D contendo inserções da proteína de interesse (S). Após transfecção e produção de estoques virais foi realizado o ensaio de western blotting para confirmação da expressão da proteína spike pelo vírus quimérico.

Palavras-chave: Vacina; Vírus; SARS-CoV-2; Spike.

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