VAC_16 - Is the CLEC5A involved in immune response control after a mRNA COVID-19 bivalent vaccine using a mice model?

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Introduction: Several vaccines platforms have been used to improve the vaccine development for coronavirus- 2019 (COVID-19), including viral vectors and mRNA vaccines with satisfactory safety and efficacy data, and they were licensed since 2021 worldwide, including Brazil. Although the development of new vaccines was possible and able to reduce severe disease and deaths caused by coronavirus, variants of concern emerged, as Omicron strain, showing to be more transmissible as well as a strategy for viral escape from immunization.

Objectives: Regarding that, this study aimed to verify the role of the CLEC5A gene expression, such as the inflammatory genes during a mRNA vaccination using a commercial bivalent vaccine previously and after vaccination.

Methodology: Gene expression of *CLEC5A*, *IL1B*, *IL6*, *IL12*, *NFKB*, *TNFA*, *IFNA*, *IFNB*, and *IFNG*, were used to measure the levels of RNAm expressed by cells from immunized mice with a bivalent commercial vaccine (BNT162b2 BA.4/5 bivalent mRNA vaccine (Pfizer–BioNtech) before and after viral challenge (SARS-CoV-2 Gama variant). For this, we used a mice model to analyze the role of this pathway in the attempt of the disease control by immunization.

Results: The results showed that *CLEC5A* is activated after viral challenge (0.91-fold-change), but it was reduced post immunization (0.37-fold-change). Taken together *IFNA* was highly expressed by immunized mice and diminished significantly after viral challenge ($p<0.01$), showing a possible regulation of this pathway by the virus. In addition, *IFNG* was activated by immunization using a commercial bivalent vaccine and did not change after viral challenge. The inflammatory genes, as *TNFA* and *IL12* presented an increase after viral challenged in vaccinated group compared with immunized mice not challenged with the virus, but it was not significant.

Conclusion: Our preclinical findings showed that CLEC5A can be part of a panel to evaluate COVID-19 immunization, as well as can monitor the inflammation and antiviral status.

Keywords: CLEC5A; mRNA vaccine; COVID-19