

**BIO\_18 - Development of a technological platform for whole Immunoglobulin G purification as the first step towards an antigenic test for COVID-19 by the Vital Brazil Institute**

Rafael Cordeiro e Silva<sup>1</sup>; Camila Braz da Costa<sup>1</sup>; João Ricardo Almeida Soares<sup>1</sup>; Julia Vasconcelos Rodrigues de Assis<sup>1</sup>; Luana Gomes da Silva Ribeiro<sup>1</sup>; Lidiane Conceição Rosa<sup>1</sup>; Luis Eduardo Ribeiro da Cunha<sup>1</sup>; Helena Carla Castro<sup>2</sup>; Evelize Folly da Chagas<sup>2</sup>.

<sup>1</sup>Instituto Vital Brazil

<sup>2</sup>UFF - Universidade Federal Fluminense

**Introduction:** During the COVID-19 pandemic, which caused over 6,689,977 deaths worldwide, with over 693,853 just in Brazil, several methodologies for the diagnosis of this disease were researched, among which the purification and use of Immunoglobulins G. The Vital Brazil Institute, one of Brazil official laboratories with extensive experience in purification, promoted a study to develop an equine hyperimmune serum against SARS- CoV-2 Spike glycoprotein and another to purify intact IgG following World Health Organization guidelines as the first stage of development of a new technological platform for the production of diagnostic kits. Thus, this study was conducted to obtain whole IgGs by Caprylic acid fractionation, by an WHO-recognized methodology, but innovative for the Institute.

**Objectives:** To produce a concentrate of anti-SPIKE protein Immunoglobulins of SARS-CoV-2 as the first step towards the production of an antigenic test for COVID-19.

**Methodology:** Pooled equine plasma pH was adjusted to 5.8 and the temperature to 37°C at 150 rpm. Then, Caprylic acid was added at a concentration of 5% (v/v) increasing the agitation to 250 rpm, where it remained for 60 minutes. Thus, the solution was filtered through the cotton canvas and dialyzed in dialysis tape (14 kDa) exchanging 100x the volume. A sample was taken for an electrophoretic analysis gel (10%). After electrophoresis and coloring, the gel was digitized using the GelDoc Go Imaging System densitometer and the image was treated in the ImageLab software (BioRad).

**Results:** Comparing the plasma sample with the concentrate, the electrophoretic test performed showed an increase in the average purity of the IgG label ( $\approx$  150 kDa) from 32.8% to 60.9%, thus demonstrating the efficiency of the technique for increasing the purity.

**Conclusion:** The tested methodology was effective to recover IgG from the equine plasma pool with high purity.

**Keywords:** Immunoglobulin G, rapid diagnostic test, Covid-19