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# Establishment of a Rapid-Response Platform for Influenza A (H5) VLP Production Soraia Attie Calil Jorge

**Butantan Institute, BR**

Statement of the Problem: The World Health Organization highlights the need for pandemic preparedness, emphasizing the global spread risk of Influenza H5, a highly pathogenic avian influenza subtype. Our project focuses on developing rapidresponse biotechnological platform for vaccine and diagnostic kit production using virus-like particles (VLP) technology, supporting innovation as well as strengthening public health system at Brazil. Methodology & Theoretical Orientation: The coding sequence of the hemagglutinin H5 (Astrakan strain) was used to generate a recombinant baculovirus by using the BacTo-Bac ™ Baculovirus Expression System (Thermo Scientific). We used Cellfectin (Thermo Scientific) and Sf9 insect cell culture to express the H5 protein and baculovirus. Findings: We inserted the sequence of H5 into pFAST-Bac1. Next, to generate a recombinant plasmid containing these sequences, we utilized the Bac-To-Bac ™ Baculovirus Expression System (Thermo Scientific) which generates a recombinant plasmid by transposing a mini-Tn7 element from the pFastBac™ donor plasmid to the mini-Tn7 attachment site in the bacmid. To confirm that the recombination occurred effectively, we detected the inserted sequence on the recombinant bacmid through conventional PCR. Finally, the H5 recombinant bacmid was transfected into Sf9 insect cells to generate P0 recombinant baculovirus stock. The H5 protein was detected in this stock even thought we did not detect expression of the recombinant baculovirus itself. Conclusion & Significance: So far, we were able to successfully produce the H5 protein in vitro. Our next goal is to optimize and establish VLP production. This optimization will enhance protein yield and ensure recombinant baculovirus production. Future steps include scaling up expression and refining purification methods for further characterization. These advances will improve vaccine platforms using the baculovirus system, providing Brazil's public health with cost-effective, self-sustaining technology. This strengthens health responses and enables a faster reaction to emerging and neglected diseases.

## Biography

Graduated in Biological Sciences (USP-1992), MSc and PhD in Genetics (USP 1995/2000). Between 2000-2004, she conducted postdoctoral research at the Viral Immunology Laboratory of the Butantan Institute. Currently, she is the Technical Director of the Viral Biotechnology Laboratory at the Butantan Institute, developing research in various Viral Vaccine Production Platforms, such as recombinant protein expression in mammalian and insect cell cultures, production of Virus-Like Particles (VLPs), and production of self-replicating or non-replicating mRNA vaccines in lipid, viral, or polymeric nanoparticles.

soraia.jorge@butant an.gov.br

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