Evaluation of Bioprocesses in the Production of Rabies Vaccines

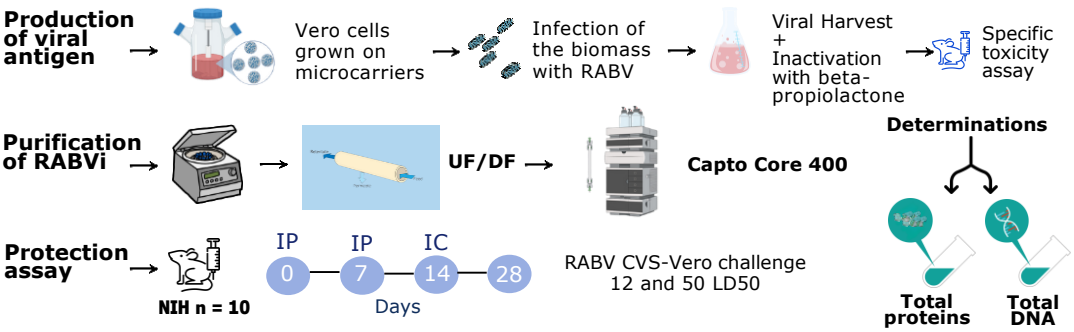
Barbara Ortiz [1], Matías Micucci [1,2], Jimena Castedo [2], Rosana Jurado [2], Oscar Pérez [1,2], Bélen Viacava [2], Matías Fingermann [1,2].

[1]Programa de Investigación e Innovación en Biotecnología PIIB/DCAyT, Universidad Nacional de Moreno., [2]Instituto Nacional de Producción de Biológicos (INPB), ANLIS "Carlos G. Malbrán".

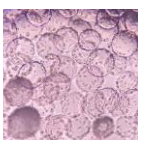
INTRODUCTION

Vaccination prevents and controls the disease caused by the rabies virus (RABV). Currently, in Argentina, vaccination campaigns use second-generation vaccines procured through tenders. The National Administration of Laboratories and Institutes of Health (ANLIS) Malbrán, with extensive experience in the production of biologicals, conducts cell cultures in the Rabies Vaccine Service (SVAR) to obtain RABV as the basis for producing experimental vaccine batches. This study aims to develop a protocol to purify inactivated rabies virus (RABVi) produced in cell cultures using microcarriers and to evaluate its efficacy in a murine model.

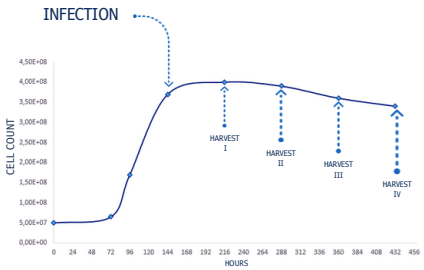
METHODS

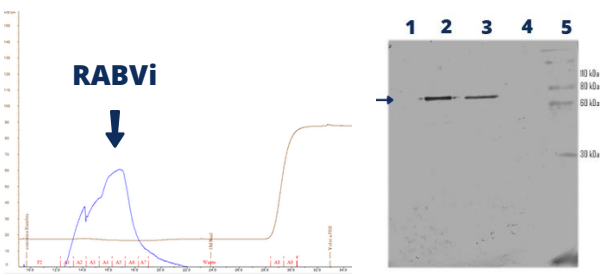


RESULTS



Vero cells on Cytodex 1 microcarriers





Capto Core 400 Chromatography. Blue: absorbance at 280 nm; Brown: conductivity. **Western Blot of bimodal chromatography**: (1) G glycoprotein VLP, (2) Concentrated flow-through fraction, (3) RABVi diafiltrate, (4) RABVi viral culture, (5) Molecular weight marker.

Sample	DNA	Total proteins
RABVi harvested	2,56 µg/mL	1100 µg/mL
Flow-through chromatography RABVi final product	<0,50 ng/mL	24,8 µg/mL

Sample	Dilution	Survival
RABVi harvested	1/60	60 %
RABVi final product	1/20	40-60 %

CONCLUSION

The combination of ultrafiltration and tangential diafiltration with a 300 KDa hollow fiber cartridge significantly reduced contaminating proteins. Additionally, the bimodal chromatography Capto Core 400 decreased residual DNA. In protection assays, the purified RABVi showed a survival rate of 40% to 60% after challenge.

bortiz@unm.edu.ar