Universidad de Navarra
Facultad de Ciencias

MASTER'S DEGREE IN BIOMEDICAL RESEARCH
Research Project Proposal
Academic year 2023-2024

Project Nº 01

Title: *Development of trans-complementation strategies for supplementation of large genes in the brain*

Department/ Laboratory Gene Therapy for rare diseases. CIMA.

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Summary

Vectors derived from Adeno-Associated Virus (AAV) are widely used in gene therapy clinical trials for the treatment of a variety of diseases. New AAV variants obtained by capsid engineering provide unique opportunities for gene transfer into the brain. However, the cloning capacity of AAV vectors is relatively low (4.7 Kb). Therefore, single AAV vectors are not suitable for a large number of human diseases.
The aim of this project is to apply techniques of trans-complementation (at the DNA or RNA level) to increase the scope of AAV vectors in the brain.
We will employ GFP and luciferase as reporter genes, and new AAV vectors capable to cross the blood brain barrier.
Transfection of genomes in cell cultures will be employed to evaluate the ability to restore the full sequence and to express the intact reporter protein. The optimal conformations will used to generate AAV vectors, and they will be evaluated in mice following different routes of administration. The efficacy of transduction and the identity of transduced cells will be studied by immunofluorescence.
We hope to generate new tools for further development of gene therapy strategies against genetic encephalopathies.

yes	X
no	

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?