Universidad de Navarra
Facultad de Ciencias

MÁSTER EN INVESTIGACIÓN BIOMÉDICA
Research Project Proposal
Academic year 2025-2026

Project Nº 37

Title: *Isolation and characterization of broad-host-range baculovirus genotypes and evaluation of genotype mixtures to enhance host range*

Department/ Laboratory *Microbial Bioinsecticides,Laboratory Institute for Multidisciplinary Research in Applied Biology (IMAB), Universidad Pública de Navarra.*

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Baculoviruses (family Baculoviridae) are double-stranded DNA viruses widely recognized for their potential as biological control agents against lepidopteran pests. Although they are highly pathogenic and environmentally safe, their use in pest management is limited by a generally narrow host range. Some baculoviruses, such as Autographa californica multiple nucleopolyhedrovirus (AcMNPV), Anagrapha falcifera MNPV (AnfaMNPV), Helicoverpa armigera MNPV (HearMNPV), and Mamestra brassica MNPV (MbMNPV) display a broader theoretical host spectrum, but their effectiveness across multiple pest species remains restricted. Traditionally, studies on these broad-host-range viruses have been conducted separately within two phylogenetic groups: Group I (AcMNPV-related viruses, including AnfaMNPV) and Group II (HearMNPV and MbMNPV). However, their combined potential has never been explored.

The aim of this project is to isolate and characterize novel genotypes from both virus groups and to assess whether mixtures of selected genotypes can expand the effective host range. Molecular characterization will be performed using restriction endonuclease analysis and next-generation sequencing to study genetic diversity and phylogenetic relationships. Biological characterization will include bioassays on target lepidopteran species representing different pest complexes, focusing on pathogenicity, virulence, and host susceptibility. Finally, mixed-virus bioassays will be conducted to evaluate whether genotype combinations from the two groups improve infection success on non-homologous hosts.

This research will provide valuable insights into the potential of combining broad-host-range baculoviruses to develop more versatile viral biocontrol agents and contribute to sustainable integrated pest management strategies.

yes	
no	X

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