Improving the Productivity of the Insect Cell/Baculovirus Expression Vector System via CRISP/Cas9 Engineering

Henry de Malmanche*, Steven Reid, Esteban Marcellin, Gabriel Visnovsky

AIBN
University of Queensland
Brisbane, QLD, Australia

The intended project will involve the engineering of the commercially relevant Sf9 insect cell line derived from *Spodoptera frugiperda* with the objective of improving the productivity and performance of the cell culture when used in conjunction with the Baculovirus Expression Vector System (BEVS) for the production of rcombinant proteins, vaccines, and virus-like particles. The project will be carried out at laboratory-bench scale using a recombinant Autographa californica nucleopolyhedrovirus (rAcMNPV) that expresses the foreign enzyme, B-galactosidase. We plan to undertake gene knockouts in the Sf9 cell line using the CRISPR/Cas9 system to target one or more genes involved in innate cellular antiviral immunity. Specifically, we plan to knock out an effector caspase, Sf-Caspse-1, so that we might engineer cells to be less apoptotic and therefore more productive. Genes involved in the antiviral RNAi response will also be considered for knockout. If we can show an increase in yield of these knockout cell lines with the BEVS at the laboratory scale, then the ultimate aim of the research will be to test the productivity of the engineered cell line/BEVS in bench scale bioreactors for the production of a commercially relevant protein or other biological at commercial production scales.

Biographic Details

Name: Henry de Malmanche
Title: PhD Candidate
University of Canterbury, New Zealand:
Phone: +61 555 26848 E-mail: hdemalmanche@gmail.com
Research interests: Synthetic Biology, Molecular Biology, Virology, Industrial Biotechnology