

# 5<sup>th</sup> World Congress on Biotechnology

June 25-27, 2014 Valencia Conference Centre, Valencia, Spain

## HRA2pl production in tobacco plants by transient transformation of plants, a fusion inhibitor in the hMPV infection in HEp-2 cell line

Verónica Araceli Márquez-Escobar<sup>1</sup>, Rocío Tirado Mendoza<sup>2</sup>, Daniel Ernesto Noyola-Cherpitel<sup>3</sup>, Abel Gutiérrez-Ortega<sup>4</sup> and Ángel Gabriel Alpuche-Solís<sup>1</sup>

<sup>1</sup>División de Biología Molecular, IPICYT, Mexico

<sup>2</sup>Facultad de Medicina de Universidad Nacional Autónoma de México, Mexico

<sup>3</sup>Facultad de Medicina, Universidad Autónoma de San Luis Potosí, Mexico

<sup>4</sup>Unidad de Biotecnología Médica y Farmacéutica, CIATEJ, Mexico

Among the available systems for the expression of recombinant proteins, the use of plants as bioreactors is one of the most promising ones, since their use reduce the production costs and post-translational modifications requested for biological activity are achieved in plants, in addition, none of few simple purification steps are needed to deliver the pharmaceutical proteins in the mucous membranes so that they may be used as antiviral peptides or vaccines against respiratory tract infectious agents.

The etiologic agents that cause respiratory illnesses are mainly bacteria and viruses; the latter are responsible for 50-60% of acute respiratory infections (IRAs). Human metapneumovirus (hMPV) is responsible for acute respiratory infections and at least for 5-10% of hospitalizations in young children, mainly in children under three years old, the elderly and immunocompromised patients. Currently there is no treatment or vaccine available against hMPV.

It has been demonstrated that the fusion of the hMPV to the host cell can be inhibited by a peptide analogous to F protein. We designed a synthetic gene expressing this peptide named HRA2pl and by a transient viral expression system (Magnifection), the recombinant peptide was produced in tobacco plants. Extraction of total soluble protein was performed and its functionality *in vitro* was examined by a Dot blot and Western blot. Its efficacy as an antiviral was evaluated by replication inhibition assays in HEp-2. This peptide could be an alternative for prevention and reduction of the transmission of hMPV.

### Biography

Verónica Araceli Márquez Escobar has completed her master degree in Molecular Biology at IPICYT, San Luis Potosí, México and she is doing her a PhD in the same institute. Her research work has been focused in the production in plants of an antiviral peptide against a respiratory pathogen called human metapneumovirus. The research group of Dr. Ángel Gabriel Alpuche Solís (her supervisor), has been working on the production of biopharmaceuticals in plants such as antiviral peptides and vaccines against infectious diseases and published more than 45 referred papers.

[alpuche@ipicyt.edu.mx](mailto:alpuche@ipicyt.edu.mx)