

## **CHIMERIC POTATO VIRUS X PARTICLES ACTIVATE INFLUENZA VIRUS-SPECIFIC CD8+ T CELLS IN MICE**

LICO C., MANCINI C., BETTI C., BENVENUTO E., BASCHIERI S.

Sezione di Genetica e Genomica Vegetale, ENEA C.R. Casaccia, 00123 Rome (Italy)

*plant virus, peptide vaccine, influenza virus, cytotoxic T cells*

Plant virus based expression strategies are the object of intensive investigations as they represent cost-effective, highly scalable and safe systems for the production of recombinant proteins for biopharmaceutical purposes. Plant viruses-based approaches have also been used to produce peptide (epitope)-based vaccines, by the construction of plant Chimeric Virus Particles (CVP) displaying the epitope of interest on their surface as fusion to coat protein (CP) units.

The efficacy of purified, plant-produced CVP in inducing antibody responses specific to the displayed peptide has been extensively demonstrated. We are presently evaluating the capability of the plant virus Potato Virus X (PVX) to elicit specific CD8+-mediated T cell responses. To this aim we have produced in *Nicotiana benthamiana* plants and purified PVX CVP displaying a D<sup>b</sup>-restricted epitope derived from the nucleoprotein (NP) of influenza A virus. Several features have been considered to obtain correctly assembled CVP, able to move systemically and to be correctly processed by antigen presenting cells (APC).

The immune response induced by the plant-produced CVP has been evaluated in mice. The results of IFN- $\gamma$  ELISPOT assays demonstrate that PVX CVP activate specific CD8+ T cells. Noteworthy, the best response is obtained without adjuvant co-delivery. Serum antibody titration indicates that this could be due to the reduced response against the viral carrier obtained in these conditions.

Our data demonstrate that plant CVP can reach MHC class I pathway of presentation despite being exogenous antigens, paving the way to the possible use of these plant-derived products as carriers able to target and activate different compartments of the immune system.