

Identifying the function of vesicle trafficking in geminiviral infection using virus induced gene silencing

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Tomato yellow leaf curl Sardinian virus (TYLCSV) is one of the causal agent of the tomato yellow leaf curl disease, one of the most important threats to tomato crops worldwide. TYLCSV is a monopartite member of the genus *Begomovirus* from the family *Geminiviridae*. To carry out a full infection, geminiviruses need to move inside the infected cell and from one cell to another for which they depend on diverse cellular factors. While cell-to-cell movement has been described to occur through plasmodesmata, the way in which geminiviruses move inside the host cells is yet unknown.

The identification of the host proteins involved in viral infection will be an important step towards the understanding of the mechanisms underlying this process. In our laboratory, transgenic *Nicotianabenthhamiana* plants containing a green fluorescent protein (GFP) expression cassette flanked by two direct repeats of the intergenic region of TYLCSV have been constructed (2IR plants). When these plants are infected with TYLCSV, an overexpression of the reporter gene is observed in those cells where the virus replicates. These plants have been used together with virus induced gene silencing (VIGS) in an effort to identify host genes involved in the infection process using a reverse genetics approach.

Using this combined technique our group has identified two genes δ -COP and ARF 1, involved in retrograde vesicle trafficking, which are essential for the infectious process. We are currently assaying genes codifying proteins involved in different pathways of the vesicle trafficking system: Sar1b, γ subunit of AP1, Sec24, SYT1 and two that encode the heavy chain of triskelion proteins. Their effect over virus infection will be presented and discussed.