

Unraveling the importance of vesicle trafficking for the movement of geminiviruses

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Tomato yellow leaf curl disease is one of the most important threats to tomato crops worldwide. One of its causal agents, Tomato yellow leaf curl Sardinian virus (TYLCSV), is a monopartite member of the genus Begomovirus from the family Geminiviridae. Due to the few proteins encoded by their viral genome, geminiviruses rely heavily on host cellular machinery and interact with a wide range of plant proteins to complete all processes required for infection, such as viral replication, movement and suppression or evasion of plant defense mechanisms. Therefore, identifying the host proteins involved in viral infection will be an essential step towards understanding the mechanisms underlying this process.

Using a reverse genetic approach our group identified a series of genes involved in vesicle trafficking, which affect geminivirus infection. Four of them are essential as their silencing produce a complete abolishment of TYLCSV infection (V-COP, ARF1, CHC1, and CHC2). However, these genes do not affect TYLCSV replication. A series of experiments using confocal microscopy and viral proteins bound to fluorescent markers have been carried out to determine the effect of inhibiting vesicle trafficking over the subcellular localization of TYLCSV's movement proteins. The biological relevance of vesicle trafficking during geminivirus infection will be presented and discussed.
