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Dominant resistance against the Tomato spotted wilt virus in Capsicum annuum is triggered by the RNA silencing suppressor protein

Resistance against *Tomato spotted wilt virus* (TSWV) isolates in *Capsicum annuum* is based on the dominant resistance gene *Tsw*. Unfortunately, resistance breaking isolates are meanwhile emerging and require monitoring and detection of their presence. Previous research performed on the identification of the avirulence determinant, the viral component triggering the resistance, showed contradictory results and left the issue unsettled.

The first aim in my project was to determine which TSWV viral protein triggered the hypersensitive response (HR). For this a suitable transient expression system in *Capsicum annuum* had to be established, and this allowed us to identify the NSs protein of TSWV as the avirulence determinant of *Tsw*-mediated resistance in *Capsicum annuum*. In a next study we investigated whether the ability of NSs to trigger the *Tsw*-mediated resistance was functionally linked to the other known function of the NSs protein; suppressing the antiviral RNAi response. We were able to show that one function could be disrupted while the other

function could be maintained, indicating that these were not functionally linked. We also looked into the effect of temperature on the ability to induce the resistance response. In general, dominant resistance genes are temperature sensitive, *i.e.* they are not functional above a certain temperature (*Tsw*: 32 °C). Besides this, a small group of TSWV isolates exhibited a temperature-dependent behaviour during induction of resistance, *i.e* they were able to induce (< 28 °C) or break the resistance (≥ 28 °C), depending on temperature. However, the underlying mechanism for this is unknown. Furthermore, we designed a diagnostic tool based on PCR to enable detection of resistance breaking isolates in the field.