# Plasmodesmal Components Involved in Cell-to-cell Transport of Potyviruses—Focus on HVA22a candidate

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*Potyvirus* is one of the largest genera of plant viruses responsible for serious diseases in vegetable and fruit crops worldwide (Scholthof *et al*, 2011). The potyviral species *Turnip mosaic virus* (TuMV) represents one of the rare examples of plant viruses that utilize the host endomembrane system to produce membranous vesicles mobile between cells. The 6K2 protein of TuMV, a small transmembrane protein, induces the formation of endoplasmic reticulum (ER)-derived viral vesicles, important not only for replication but also for intracellular and intercellular movement (Cotton *et al*, 2009; Laliberté & Zheng, 2014).

In *Arabidopsis thaliana*, AtHVA22a (***H****ordeum* ***v****ulgare* **a**bscisic acid responsive gene 22) belongs to a multigenic family of transmembrane proteins, homologous of reticulons and DP1/Yop1 family proteins (Chen *et al*, 2002), which are responsible for the constriction of ER tubules (Shibata *et al*, 2008). Reticulons play a role in positive strand RNA virus replication in animals and plants (Diaz *et al*, 2010). Moreover, semi-quantitative proteomics analysis of plasmodesmata (PD) fractions purified from *A. thaliana* suspension cells showed that AtHVA22c and AtHVA22a are highly enriched in PD proteome (Brault *et al*, 2019).

In our study, we showed that TuMV-6K2 interacts with AtHVA22a by split-ubiquitin yeast two hybrid assay (SuY2H) in yeast and further confirmed this interaction in planta by Bimolecular Fluorescence Complementation (BiFC). Overexpression of AtHVA22a increases TuMV propagation in *Nicotiana benthamiana*. Furthermore, AtHVA22a is partially re-localized at the level of the viral replication complex (VRC) during TuMV infection and the 6K2-induced vesicles at the PD. The interaction between AtHAV22a and 6K2 observed in BiFC is also localized at the VRC during viral infection.

Altogether, our results indicate that HVA22a is a candidate protein potentially involved in replication and cell to cell movement of TuMV.

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