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## Identification of plant virus receptor candidates in the stylets of their aphid vectors

**Marilyne Uzest**

INRA, UMR BGPI

[marilyne.uzest@inra.fr](mailto:marilyne.uzest@inra.fr)

Aphids are sap-feeding insects with piercing-sucking mouthparts. Their renown as major pests in agriculture relies mainly on their formidable capacity to transmit countless plant viruses to most important crops worldwide. The primary mode of virus transmission is the noncirculative manner where viruses are retained on specific receptors located in aphid stylets. These viruses are inoculated to healthy plants often within a single puncture lasting a few seconds, thereby promoting viral outbreaks. The identification of virus receptors in insects should help developing strategies to specifically target and disrupt virus/vector interactions. A few years ago, we started to characterize the receptors of the Cauliflower mosaic virus in its vectors. So far, we have discovered the acrostyle, a nano-organ in aphid stylets partly composed of receptors of plant viruses. We have characterized its proteomic surface and identified the first proteins in insect mouthparts, among which Stylin-01 involved in CaMV transmission. Other Stylins are currently studied and their role in noncirculative virus transmission evaluated.

#### Recent publications:

- Webster CG, Pichon E, van Munster M, Monsion B, Deshoux M, Gargani D, Calevro F, Jimenez J, Moreno A, Krenz B, Thompson JR, Perry KL, Fereres A, Blanc S, Uzest M. (2018). Identification of plant virus receptor candidates in the stylets of their aphid vectors. *J Virol*. 2018 May 16. pii: JVI.00432-18. doi: 10.1128/JVI.00432-18. PMID:29769332.
- Alliaume A, Reinbold C, Uzest M, Lemaire O, Herrbach E. (2018). Mouthparts morphology of the mealybug *Phenacoccus aceris*. *Bulletin of Insectology*. 71 (1):1-9.
- Webster CG, Thillier M, Pirolles E, Cayrol B, Blanc S, Uzest M. (2017). Proteomic composition of the acrostyle: Novel approaches to identify cuticular proteins involved in virus-insect interactions. *Insect Sci*. 2017 Apr 19. doi: 10.1111/1744-7917.12469.
- Jimenez J, Webster CG, Moreno A, Almeida RPP, Blanc S, Fereres A, Uzest M. (2017). Fasting alters aphid probing behaviour but does not universally increase the transmission rate of non-circulative viruses. *J Gen Virol* 98(3) :3111-3121.
- Mathers TC, et al. (2017). Rapid transcriptional plasticity of duplicated gene clusters enables a clonally reproducing aphid to colonise diverse plant species. *Genome Biol*. 2017 Apr 4;18(1):63. doi: 10.1186/s13059-017-1202-6.