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(P2-17) Viral determinant implicated in the transmission of the *Grapevine fanleaf virus* by its nematode vector, *Xiphinema index*

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Grapevine fanleaf virus (GFLV; genus *Nepovirus*, family *Comoviridae*) is an icosahedral virus with a positive sense bipartite RNA. GFLV is specifically transmitted from grapevine to grapevine by the ectoparasitic nematode *Xiphinema index* (Andret-Link *et al.,* 2004, *J. Plant Path*. 86, 183-195). Previous experiments replacing the viral GFLV coat protein (CP) gene by the CP gene of *Arabis mosaic virus* (ArMV), a closely related nepovirus specifically transmitted by *Xiphinema diversicaudatum*, indicates that the specificity of transmission is solely determined by the CP (Andret *et al*, 2004, *Virology* 320, 12-22). The objective of our study is to identify the determinants of transmission specificity on CP. We hypothesized that amino acids involved in the specificity of transmission should be different between both viruses and located at the external surface of the capsids in order to interact with potential receptors in the food canal of nematodes.

To identify divergent external amino acids, a 3D-structural model of GFLV capsid has been deduced from the 3.5 Å resolution structure of *Tobacco ringspot virus* (Chandrasekar & Johnson 1998, *Structure* 6, 157-171). Based on this model, five potential external domains, from 6 to 12 amino acids, were selected. Sixteen mutants in which these five domains were substituted either in single or multiple combinations by their ArMV counterpart domains, have been engineered. Two mutants were able to induce a systemic infection in plants. Only one lead to the loss of transmission by *X. index*, indicating a potential function of this domain in GFLV transmission.

To fully validate our model, structural analyses (cryo-electron microscopy and X-ray crystallography) are performed in parallel. For cryo-electron microscopy, images of frozen-hydrated purified viral particles of GFLV and ArMV were recorded and are analysing using the polar Fourier transforms method developed by Baker. The crystallographic study is done with GFLV purified particles. The size homogeneity of GFLV particles have been analysed by dynamic light scattering (DLS) and revealed to be highly homogeneous. Several crystallization conditions have also been tested and have resulted in viral crystals which will be used for X-ray diffraction and modelling studies.