Root-knot nematode feeding site development is impaired by cyclin-dependent kinase inhibitors

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Plant-parasitic nematodes of the genera *Meloidogyne* trigger the formation of giant cells that undergo recurring acytokinetic mitosis and endocycles. Expression analyses of key cell cycle genes showed their early induction in the nematode feeding site (NFS). Additionally, disturbance in NFS development and juvenile maturation were observed during treatment of infected roots with cell cycle inhibitors. Intense DNA synthesis and enlarged nuclei demonstrated that giant cells undergo additional endocycles. How precisely nematodes manipulate the cell cycle in their favour remains to be understood. A systematic comparison of the temporal and spatial expression pattern of core cell cycle genes between uninfected roots and in galls of *Arabidopsis thaliana* resulted in the identification of a collection of genes up- or downregulated in NFC. Among them, negative regulators are candidates to control the cell cycle in NFC. Previous work has shown that KRP2, a member of the cyclin-dependent kinase/kip-related proteins (ICK/KRP), regulate mitosis-to-endocycle transition in plant cells, and is expressed in endoreduplicating cells. The KRP2 gene showed to be expressed during gall development. Therefore to study the relevance of the KRP cell cycle inhibitor genes (7 in *Arabidopis*) for NFS ontogeny, mutant lines over-expressing and knocked-out are being tested to determine their effect on feeding site development. *In vivo* subcellular localization studies have been carried out to better understand the dynamics of these proteins during giant cell development. Based on these data, three KRP genes are perceived to control giant cell size and consequently nematode reproduction.

Key words: *Arabidopis*, cell-cycle, *Meloidogyne incognita*