



## ***ABSTRACT***

*"Root branching controlled by the tips"*

**Prof Tom Beeckman**

**VIB, Dept. of Plant Systems Biology  
Ghent University  
Gent  
BELGIUM**

In the root, branching, i.e. *de novo* organogenesis or formation of lateral roots, is known to occur outside the apical meristem in a distinct monolayer of cells, designated as the pericycle. Not every pericycle cell becomes implicated into lateral root formation and it has been proposed that an auxin-dependent signaling mechanism will result in the specification of some cells as “founder cells”. Founder cell specification is not a continuous process but presents an oscillatory appearance that is proposed to be determinative for the longitudinal spacing of lateral roots along the primary root. However, the molecular mechanisms driving the periodical specification of founder cells remain largely elusive. Through a targeted transcript profiling approach, the Root Development group in Gent (Belgium) has obtained new insights into this very early step of lateral root formation. Our results support a hypothesis in which multiple tissue-specific successive auxin signaling modules are involved during the entire process of lateral root formation. The earliest auxin signaling module is situated in the root apex in proximity of the root apical meristem. Furthermore, a chemical compound screening unmasked the importance of precursor-to-auxin conversion activities in the very root tip. In summary, the root tip is a crucial activity centre that has a decisive role on the way roots colonize the surrounding soil.