



The research group *Plant Systems Modeling* of the Department *Plant Systems Biology* at the VIB in Ghent, Belgium, has an opening for a

Research Assistant / Ph. D student (f/m)
Computational modeling of auxin dynamics during lateral root initiation

The department plant systems biology of the VIB has an opening for an ambitious and energetic research assistant in the new research group *Plant Systems Modeling*, that focuses on computational modeling of plant development biology. Systems biology is a relatively new approach in biology, that shifts focus from individual molecules, genes and cells to their dynamic interplay: how do molecules, genes and cells form a working mechanism, behaving in a predictable way? A crucial pillar in this approach at the interface of biology, physics and computer science, is computational modeling. Modeling the biological system in a computer simulation gives us insights into developmental mechanisms, and helps us identify the gaps in our understanding of the biological system. These insights suggest new experiments, which our experimental collaborators test in the wet-lab.

What will be your task?

You will be building and analyzing dynamical models of lateral root initiation, in close collaboration with molecular biologists in the research group *Root Development* headed by Dr. Tom Beeckman. Lateral roots originate from cells in the root basal meristem, a proliferating tissue region just above the root tip, forming a regular branching pattern with evenly spaced lateral roots. The crucial signal for initiating the lateral root is most likely the phytohormone auxin. Auxin levels oscillate at a period of around 15 hours, precisely coinciding with the rhythm by which new lateral roots appear. Our modeling project aims at unraveling the mechanisms behind these oscillating auxin flows, which may be driven by a dynamics interaction between auxin and the production and cellular localization of its transporter proteins, including PIN, AUX and LAX. In the second part of your project you will also include root growth and the tightly orchestrated cell divisions following lateral root initiation.

Your background

For this challenging project that should lead to a Ph.D dissertation we are looking for a motivated MSc in Biology or Biotechnology with interest and affinity for mathematics and computer science, or an MSc in physics, applied mathematics or computer science with interest and affinity for biology. Programming experience (C++ or similar) and experience in biological modeling are a big plus.

What do we offer you?

This project gives the opportunity to get a Ph.D in systems biology, in an energetic, international, multi-disciplinary environment. We have funding for four years, but we encourage you to apply for external funds.

Interested?

Have a look at our website, www.psb.ugent.be, and send us your cv and motivated letter of application, to:

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