Postdoctoral fellowship (2 years) in a collaborative project between Umeå Plant Science Center (Sweden) and INRA (France):

**An evo-devo approach to elucidation of the molecular mechanisms underlying non-cell-autonomous lignification**

Plant xylem tissues consist of vessel elements and fibers which deposit secondary cell walls as a part of their maturation. Lignin is a cell wall component that reinforces the walls and confers a hydrophobic barrier which is crucial for water transport in the xylem vessels. We have shown that lignification is partially a non-cell-autonomous process in which the lignin monomers are supplied to the lignifying cells by their neighbouring cells (Pesquet et al. 2013, Plant Cell 25:1314-28). We have also identified parts of the molecular machinery that mediate the non-cell-autonomous lignification of the xylem vessel elements. The post doc project will build on these results and focus on the role of a nuclear, cupin-domain containing family of proteins in regulation of lignification with the help of various molecular, genetic and physiological methods.

The project includes analysis of the cupin-domain containing family of proteins on the DNA, RNA, and protein levels, as well as functional assays in hybrid aspen (*Populus tremula x tremuloides*) trees and *Brachypodium distachyon*. The project is divided between two different laboratories; one at UPSC and one at INRA Nantes in France. Transgenic overexpression and RNAi lines in hybrid aspen will be characterized for growth, wood chemistry and non-cell-autonomous lignification using e.g. the high resolution vibrational spectroscopy chemotyping facility at UPSC. Novel, transgenic approaches will be taken by a CRISPR-Cas9 based technology. Several mutants have been identified in *Brachypodium*, and these will be characterized at the BIA Unit at INRA, Nantes. Both the *Populus* trees and the *Brachypodium* lines will be analysed also for saccharification after enzymatic hydrolysis. The results are expected to reveal at least parts of the molecular mechanisms underlying the non-cell-autonomous lignification and allow an evo-devo approach to the function of this cupin-domain containing protein family.

This is a collaborative project between Umeå Plant Science Centre (UPSC) and Institut National de la Recherche Agronomique (INRA). The post-doctoral fellow will be recruited in Sweden but visit INRA Nantes in France for several months. The fellowship is funded by the Kempe Foundations for two years with an amount of 270 000 SEK per year. Starting date is September, 1, 2018 or according to agreement.

Project leaders are Hannele Tuominen (UPSC; https://www.upsc.se/hannele_tuominen) and Richard Sibout (INRA, Nantes; https://www6.angers-nantes.inra.fr/bia_eng/Home/Staff-members/S/SIBOUT-Richard).

**Qualifications**

The successful candidate should have a PhD degree in biology, biochemistry or engineering sciences. Experience in standard molecular biology techniques, plant genetics and statistical analyses is a prerequisite. Previous experience in wood chemical analysis is a big bonus. The successful candidate is expected to have good social skills and the ability to function
independently, as well as in a team. Good oral and writing skills in English are essential qualifications.

For more information CLICK HERE

How to apply
The application should contain:
• Motivation letter (max 1 pages),
• A description of research experiences
• CV with full publication list
• Copies of relevant degree certificates
• Copies of doctoral thesis and relevant publications
• Contact information of two referees.
The application shall be written in English. Your complete application, marked with reference number FS 2.1.6-979-18, should be sent electronically (PDF) to medel@diarie.umu.se (with reference number on the subject line) no later than 2018-07-31.
A copy of the application should also be sent directly to hannele.tuominen@umu.se and Richard.sibout@inra.fr.

More information about the project partners:
– The Umeå Plant Science Centre (UPSC) is a research centre in Umeå (Sweden) where research of both basic and strategic importance is conducted. Research at UPSC covers a wide range of disciplines in plant biology including ecology, genetics, physiology, biochemistry, cell biology and molecular biology. The work at UPSC is carried out at all organizational levels of the plant with a common goal to understand the plant as a complex organism in dynamic interaction with its environment. UPSC hosts close to 200 employees and 35 principal investigators, representing more than 40 nationalities. The main affiliations of the research groups are the Department of Plant Physiology at Umeå University and the Department of Forest Genetics and Plant Physiology at the Swedish University of Agricultural Sciences (SLU). For more information please visit http://www.upsc.se.
– The INRA Angers-Nantes Research Center has the mission to carry out research in plant sciences, plant breeding and biobased products. The research focuses on many aspects of plants: from genes and genomes to plant development (from seed to the whole plant level, including plant products) and interaction with the biotic and abiotic environment during different stages of their life cycle, and from genetic diversity to plant breeding. The laboratories of the center have a long-standing expertise in the field of plant biology, including genomics, genetics, breeding, metabolism, cell biology, development and plant cell wall both on model and crop plants as well as fruit trees. The INRA Angers-Nantes Center has established an internationally recognized reputation in plant molecular biology, plant breeding and biobased product characterization. For more information please visit http://www.bap.inra.fr/en and http://www.cepia.inra.fr/en.