Job Posting – Early Stage Researcher in Biology

Marie Curie Initial Training Network "SHeMat" (FP7-PEOPLE-ITN-2011-290308) for **Self-Healing Materials**: from Concepts to Market.

Recruiting organisation: Plant Biomechanics Group, Botanic Garden, Faculty of Biology, University of Freiburg, Germany

Project title: *»Self-repair mechanisms in plants growing under extreme ecological conditions as concept generators for self-repairing technical structures«*

Project period: From 1st July 2014 until 31st December 2015

Research group: Since 2002 the University of Freiburg is founder member of the »Competence Network Biomimetics«, an interdisciplinary working network, whose members are engaged in the systematic transfer of problem solutions of nature into technical applications (biomimetics). In the Plant Biomechanics Group situated at the University of Freiburg and member of the »Competence Network Biomimetics« the main focus of the research and development activities is the quantitative analysis of the relationship of form, structure and function in plants and plant organs, and the transfer of principles into innovative bio-inspired technical products. The scientists of the group cover with their competences the whole value chain from basic biological research to the development of biomimetic products on a lab-bench scale.

Preliminary studies: Plants have increasingly developed the ability to seal and heal wounds during the evolutionary process over the last 3.8 billion years. Based on self-sealing processes found in vines the principles were successfully transferred into the development of a biomimetic patent-registered self-repairing PU-foam coating for the membranes of pneumatic systems. Quantitative analyses of self-healing mechanisms in latex containing plants were prerequisites for the development of rubber based elastomeric materials that are able to repair themselves or to reduce respectively to stop propagation of occurring micro-cracks.

Project target: In this project promising model plants from different systematic groups will be screened and selected for self-repair mechanisms. Since a high evolutionary pressure on the development of self-healing abilities can be assumed, independent evolution of self-healing including different mechanisms and structures in different plant groups and species can be

expected. Plants growing under extreme ecological conditions as e.g. in arid or other habitats with high drought stress or in highly UV exposed environments have an especially high selective pressure on the development of very effective and fast self-repair mechanisms. Quantitative structural and functional analyses of the self-healing processes in selected model plants will help to specify novel mechanisms of self-repair. These studies are a prerequisite for a successful transfer into innovative biomimetic self-repairing materials that will also function under harsh environmental conditions.

Scientific background of the fellow: Applicants must meet the ***eligibility requirements*** and hold a ***master's degree in biology***. Key competences for understanding the structure-function-relationships in plants are quantitative analyses based on morphological-anatomical and biomechanical experiments. Knowledge and experience in ***histo-chemical procedures***, ***microscopic methods*** as well as ***mechanical testing***, a good knowledge about plant diversity, and experience in the field of self-healing materials will be greatly appreciated.

Salary: The candidate will get full salary employment contracts with all social securities (assurances) of European standard; moreover, different benefits (for instance, travel allowance) will be paid.

Eligibility conditions (at the time of selection)

- Researchers can be of any nationality. They must comply with the rule for mobility. Researchers are normally required to undertake trans-national mobility (i.e. move from one country to another) when taking up their appointment.
- One general rule applies to the appointment of researchers in a network: At the time of recruitment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the 3 years immediately prior to the reference date. Short stays such as holidays and/or compulsory national service are not taken into account. As far as international European interest organisations or international organisations are concerned, this rule does not apply to the hosting of eligible researchers. However the appointed researcher must not have spent more than 12 months in the 3 years immediately prior to the reference deadline for submission of proposals or recruitment by the host organisation.
- Early-stage researchers must be, at the time of recruitment by the host organisation, in the first four years (full-time equivalent) of their research careers and have not yet been awarded a doctoral degree. This is measured from the date when they obtained the degree which would formally entitle them to embark on a doctorate, irrespective of whether or not a doctorate is envisaged.

Furthermore applicants should:

- Be fluent in English
- Provide outstanding marks and benefits (preferably under the best 10 % of the graduation year)
- Be experienced and interested in interdisciplinary research
- Be flexibility to move around within the project duration

Candidates should send an application with the following documents:

- Cover letter in English
- CV (with address, e-mail address, birth date and place, nationality, photo, scientific education, in particular also a list of the attended Bachelor and Master courses)
- Certificates of the Diplomas/Degrees obtained (Bachelor's, Master's or equivalent graduate studies)
- A letter of motivation mentioning the scientific experience, knowledge, competences, goals. It should also include an expressed option why choosing this ITN and the respective position and how the ITN will benefit from the candidate's expertise and skills. (400 words)
- Names of two persons as references as minimum

to:

Dr. Olga Speck

olga.speck@biologie.uni-freiburg.de

University of Freiburg
Botanic Garden
Schaenzlestr. 1
D-79104 Freiburg
Germany

Application: as soon as possible