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Research Success Story



Image credit: Nico Bruns - Adolphe Merkle Institute

A TRAINING NETWORK TO DEVELOP SYNTHETIC MATERIALS INSPIRED FROM PLANTS

Developing new materials inspired from plants is the aim of the Horizon 2020 training network PlaMatSu (Plant-Inspired Materials and Surfaces). Prof. Nico Bruns of the Adolphe Merkle Institute is coordinating this network, which funds nine PhD students at the universities of Fribourg, Freiburg-im-Breisgau and Cambridge. The research combines biology, chemistry and physics to synthesise new materials inspired from the surface of leaves and flowers.

Nico Bruns is a specialist in bio-inspired materials at the Adolphe Merkle Institute (University of Fribourg). He coordinates an Innovative Training Network (ITN) that was awarded a €2.3 million grant from the Horizon 2020 programme. This network is a collaboration between the universities of Fribourg, Cambridge and Freiburg-im-Breisgau. “The idea”, explains Prof. Bruns, “is to create a curriculum that goes beyond ordinary PhDs and trains highly ‘employable’ interdisciplinary scientists. The training includes such elements as a one-month internship in an industrial environment, a technical transfer workshop, and a seminar in ethics.”

Interdisciplinary research

The network is investigating plant surfaces and attempting to develop synthetic materials inspired by these surfaces. It brings together

specialists in biology, chemistry and physics.

Animals have inspired many new materials, from anti-reflective coatings to colorants or adhesive surfaces, but research in new materials inspired by plants has been more limited.

“The network — called PlaMatSu for “Plant-Inspired Materials and Surfaces”— will train a new generation of scientists in this emerging domain”

Valuable funding

“The EU funding also gives us an opportunity to do great research and tighten existing links with the universities of Freiburg and Cambridge.”

The Adolphe Merkle Institute hosts the Swiss National Centre of Competence in Research (NCCR) on Bio-Inspired Materials. “The NCCR has many synergies with the training network. Our Centre specialises in materials science, and the network strengthens our collaboration with biologists.”

The surface of plants’ leaves and petals – called the “cuticle” – can be highly sophisticated. The objective of the research led by the network will be to characterise cuticles (biology) and to replicate some useful functions with synthetic polymers (materials science).

Potential applications include artificial colouring that imitates the way some flowers (such as the tulip in the picture) produce colours with microscopic grooves in their cuticle.

About PlaMatSu



Image credit: Christian Doninelli - University of Fribourg

“The EU funding allows us to train highly skilled interdisciplinary scientists, beyond what an ordinary PhD would provide”

Prof. Nico Bruns

SNSF Professor of Macromolecular Chemistry, Adolphe Merkle Institute, University of Fribourg

CONTENT SUMMARY

PlaMatsu is an Innovative Training Network, funded by the European Commission's Horizon 2020 programme. It brings together plant biologists, polymer chemists and soft matter physicists from three leading European universities in the field of bio-inspired materials: Fribourg (CH), Freiburg (D) and Cambridge (UK). The network sponsors nine PhD students to investigate multifunctional plant surfaces and develop novel materials based on the working principles of these surfaces.

Euresearch is the Swiss network mandated by the State Secretariat for Education, Research and Innovation to provide targeted information, hands-on advice and transnational partnering related to European research and innovation programmes.

FACTS AND FIGURES

Project Name

PlaMatSu – Plant-Inspired Materials and Surfaces

Research Area

Bio-inspired materials

Organisation

University of Fribourg, Switzerland (Coordinator) and 2 partners

Start Date – End Date

01.10.2016 – 30.09.2020

Duration

4 years

Project Cost

€2.3 million

Project Funding

€2.3 million

Programme

Horizon 2020 Excellent Science: Marie Skłodowska-Curie Innovative Training Networks

More Information

www.plamatsu.eu

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