



Press Release

Synthetic Furnishings for the Cell

Stefan Schiller receives 3.4 million euros in funding from the Federal Ministry of Education and Research

The chemist Dr. **Stefan Schiller** from the University of Freiburg has received the research prize “Nächste Generation biotechnologischer Verfahren – Biotechnologie 2020+” (“Next Generation of Biotechnological Methods – Biotechnology 2020+”) from the Federal Ministry of Education and Research (BMBF) for his project “Universal Molecular Production Organism”, which aims to modify bacteria for the environmentally friendly and energy-efficient production of active substances, chemicals, and biomaterials. The prize is worth around 3.4 million euros, which Schiller will use to finance a team of six scientists in the coming five years.

The research group is working on developing new functional units for bacteria. Higher cells contain organelles that fulfill particular functions in specially fitting reaction chambers – similar to organs in the human body. Bacteria, on the other hand, are important for many biotechnological applications but do not contain organelles. Stefan Schiller and his team want to change that: They are studying the chemical processes of cells and create synthetic organelles as reaction chambers for bacteria. “You might think of it as designing complex molecular-synthetic furnishings for empty spaces in bacteria,” explains Schiller. Equipped in this way, the unicellular microorganisms can be made to produce useful substances. In the long term, the researchers hope that this will lead to the creation of modular functional units that can be assembled in various combinations to form a universal production organism – a living factory.

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The BMBF has awarded the research prize “Nächste Generation biotechnologischer Verfahren – Biotechnologie 2020+” every two years since 2012 for innovative concepts in biotechnology. The goal of the award is to enhance the visibility of scientific breakthroughs that are relevant for the development of the next generation of biotechnological methods. The Freiburg project left 20 other projects behind in the competition.

Stefan Schiller is a research group leader at the Center for Systems Biology (ZBSA) and a member of the Cluster of Excellence BIOSS Centre for Biological Signalling Studies of the University of Freiburg. He came to Freiburg in 2008 as a junior research fellow at the School of Soft Matter Research of the Freiburg Institute for Advanced Studies (FRIAS), where he worked at the Institute of Macromolecular Chemistry. He characterizes his work as a combination of chemical and synthetic biology that aims to develop nano-biotechnological systems for biotechnology, chemistry, medicine, and materials sciences and study them with methods from systems biology.

More information on the group’s website:

www.biotectonic.de

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The University of Freiburg achieves top positions in all university rankings. Its research, teaching, and continuing education have received prestigious awards in nationwide competitions. Over 24,000 students from 100 nations are enrolled in 188 degree programs. Around 5,000 teachers and administrative employees put in their effort every day – and experience that family friendliness, equal opportunity, and environmental protection are more than just empty phrases here.