Website address:
https://www.gesundheitsindustrie-bw.de/en/article/erc-advanced-grants-researchers-universitaet-heidelberg

ERC Advanced Grants for Researchers at Universität Heidelberg

Prof. Dr Fred Hamprecht from the Interdisciplinary Center for Scientific Computing of Heidelberg University is receiving valuable funding from the European Research Council (ERC), an ERC Advanced Grant, which will support a project in the field of computational quantum chemistry. In the context of this project, Prof. Hamprecht is developing new approaches to machine learning able to predict the properties of molecules and materials. An ERC Advanced Grant also goes to Prof. Dr Andreas Meyer-Lindenberg, Director of the Central Institute of Mental Health and professor at the Medical Faculty Mannheim of Ruperto Carola. With the ERC funding he wants to be the first to shed light on the neurobiological mechanisms connecting heat and aggression. The ERC is allocating both Prof. Hamprecht and Prof. Meyer-Lindenberg approximately 2.5 million euros each for five years to carry out their research.

With his ERC-funded project "Learning Orbital-Free Density Functional Theory" (LearningOFDFT), Prof. Hamprecht aims to develop a precise and stable calculation of molecular energies based on electron densities in what is called an orbital-free approach. To do so, the scientist and his team are working on new methods of machine learning-enhanced calculation with which the energy of molecules can be derived from the distribution of electrons in space alone. The goal of the new method is to enable precise predictions even for complex systems – distinctly faster than conventional quantum chemistry methods – and thereby contribute to resolving a problem that has been open for decades. The planned work falls under the category of basic research in quantum chemistry. In the long term, however, the results are intended to advance applied research – from the analysis of biomolecular reactions to the development of environmentally friendly materials. Fred Hamprecht has been teaching and conducting research at Heidelberg University since 2001 and heads the research group "Scientific Artificial Intelligence" at the Interdisciplinary Center for Scientific Computing.

Why high temperatures favor aggressive behavior and what processes in the brain are responsible for this is the research topic of Prof. Meyer-Lindenberg. His ERC-funded project "Neuroecological Mechanisms Linking Heat and Aggression Risk" (HOTHEAD) centers on the neuronal circuits controlling aggression and temperature regulation in the brain. They are as old as evolution and resemble one another in many species, including mice, rats, dogs and even fish. Since a rise in aggression is observed with human beings and also with these animals, Prof. Meyer-Lindenberg and his team assume there is a common biological mechanism which they wish to directly prove for the first time. The results of the ERC project are to contribute to the development of strategies with which societies can better protect themselves against the consequences of global warming. Andreas Meyer-Lindenberg has, since 2007, directed the Central Institute of Mental Health, at which he heads the Department and Clinic of Psychiatry and Psychotherapy. He holds the Professorship for Psychiatry and Psychotherapy at the Medical Faculty Mannheim of Heidelberg University.

The ERC Advanced Grant of the European Research Council goes to outstanding established researchers who wish to implement a groundbreaking, ambitious research project as part of their scholarly activity. The maximum length of funding is five years.

Press release

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Source: Heidelberg University

Further information

- Heidelberg University