Website address:
https://www.gesundheitsindustrie-bw.de/en/article/press-release/new-emmy-noether-junior-research-group-biological-data-science

New Emmy Noether junior research group for biological data science

An Emmy Noether junior research group at Heidelberg University is investigating how to gain new insights into fundamental biological mechanisms from large-scale molecular data sets. Led by Junior Professor Dr Britta Velten, it has started work at the Centre for Organismal Studies and the Interdisciplinary Center for Scientific Computing. Prof. Velten's research team wants to develop a procedure based on machine learning and statistical methods with which to model the impacts of genetic changes on different organisms. The German Research Foundation (DFG) is funding the six-year studies in the field of data science in biology to the tune of approximately 1.4 million euros.

When it comes to understanding the mechanisms underlying the function, development and plasticity of organisms, single-cell sequencing supplies important insights into the molecular make-up of individual cells and their interplay in complex tissues. This can be combined with targeted genetic interventions using the CRISPR technology. "To be able to reliably estimate the impacts of such interventions and compare them across biological systems, we need reliable statistical methods with which very large data sets can be analysed," Prof. Velten explains. Developing such a method is the goal of her Emmy Noether group's research and the project, "A statistically sound and accessible framework for causal regulatory inference from high-content CRISPR screens". The researchers use approaches from machine learning and causal inference – a statistical method for estimating the effect of an intervention. This is to make it possible, for instance, to model all impacts of a genetic change and draw conclusions about underlying molecular mechanisms.

Britta Velten completed her bachelor's and master's degree in mathematics at Heidelberg University. In 2019 she earned her doctorate in the field of statistics at ETH Zurich (Switzerland) and the European Molecular Biology Laboratory in Heidelberg. Before, in May 2023, she was appointed to a tenure-track professorship for multifactorial data analysis and machine learning in the life sciences at Heidelberg University, she did postdoctoral research at the German Cancer Research Center in Heidelberg and the Wellcome Sanger Institute in Cambridge (United Kingdom).

The Emmy Noether Programme of the German Research Foundation gives exceptionally qualified young researchers the opportunity to prepare for a university professorship by leading an independent junior research group over a period of six years.

Press release

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Further information

- Heidelberg University
- German Research Foundation