Website address:
https://www.gesundheitsindustrie-bw.de/en/article/press-release/otto-hahn-medal-jonas-wilhelm

Otto Hahn Medal for Jonas Wilhelm

For his outstanding achievements in his doctorate at the interface between chemistry and biology, Jonas Wilhelm is awarded an Otto Hahn Medal 2025 by the Max Planck Society. He wrote his doctoral thesis in the department Chemical Biology of Kai Johnsson at the Max Planck Institute for Medical Research.

“I'm delighted that my doctoral thesis has been honored,” says Jonas Wilhelm, who completed his doctorate at the Max Planck Institute (MPI) for Medical Research in Heidelberg. “It was very exciting to develop a molecular tool that is now available to scientists for new experiments and to further advance research. My project was very interdisciplinary and collaborative, and I am very grateful to my colleagues at the MPI for their support and cooperation, as well as to the numerous external collaboration partners.” The title of his medal-winning dissertation is ”Engineering of a Split Self-Labeling Protein for Recording Neuronal Activity and Connectivity“.

Permanent recording of intercellular processes

In order to understand how living beings react to external stimuli, how nerve cells communicate or how diseases develop, we need to be able to understand what happens at a cellular level. This can be observed under the microscope, but often only in real time and limited to a relatively small number of cells. In his doctoral thesis, Jonas Wilhelm developed a molecular tool that makes it possible to record intercellular activities chemically so that they can be studied later – even in many thousands of cells simultaneously.

Its development is based on the approach of splitting the self-labeling protein HaloTag into two fragments. As a “split HaloTag”, its ability to be labeled is deactivated. However, the moment the two fragments are reassembled – for example with the help of a messenger substance such as calcium – the HaloTag becomes active again: it permanently marks precisely this moment with a fluorescent chemical dye. This effect can be used in a targeted manner to retrospectively determine when processes took place in which cells.

His colleagues from Kai Johnsson's department at the MPI for Medical Research, in particular Magnus Huppertz and Julien Hiblot, as well as researchers at the MPI for Biological Intelligence in Martinsried have since used the technology in the brains of living flies and zebrafish to record activity patterns in response to visual stimuli – in thousands of cells simultaneously across entire brains. Since then, it has also served as the basis for the development of additional molecular tools in Kai Johnsson's department.

Highly versatile method

In a subsequent step, Jonas Wilhelm further developed the “split HaloTag” technology using computer-assisted methods with the aim not only of recording neuronal activity, but also of visualizing synapses. This opens up new possibilities for investigating how nerve cells are connected– crucial for gaining a better understanding of the brain. During his doctorate, he was able to apply his new technology in a simplified model system using cultured cells.

The Otto Hahn Medal was awarded at the Annual General Meeting of the Max Planck Society in June 2025.

Press release

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Further information

- Max Planck Institute for Medical Research