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Press Release

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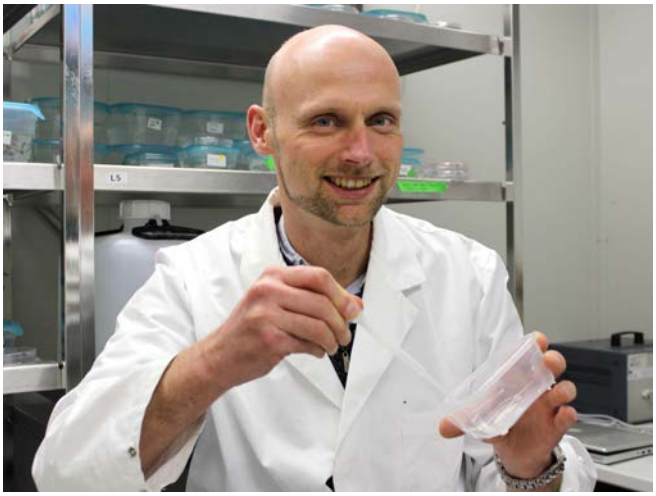
Jochen Rink is new Director at the Max Planck Institute for Biophysical Chemistry

The developmental biologist took up office on April 1, 2019. Rink investigates how flatworms manage to completely regenerate their tissue following injury, and why this ability is an exception rather than the rule in the animal kingdom.

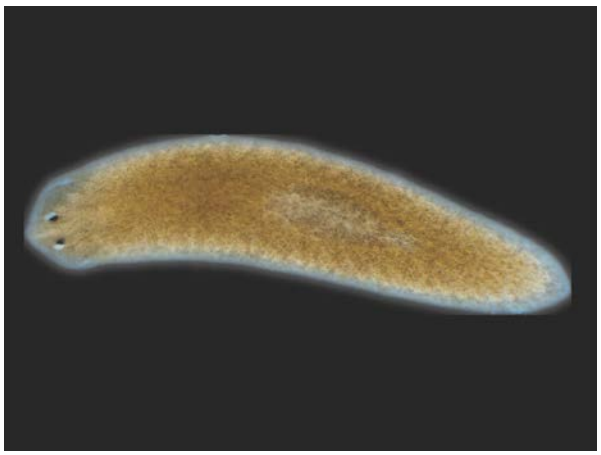
Rink moves with his research group from the Max Planck Institute (MPI) for Cell Biology and Genetics in Dresden to the Göttingen institute, where he will be heading his own department.



Dr. Jochen Rink
(Photo: Max Planck Institute for Cell Biology and Genetics)

“Jochen Rink is a prime example for a highly interdisciplinary scientist. In his research he unites cell and developmental biology, evolutionary questions, and bioinformatics. In covering this diverse spectrum of research topics he perfectly fits in with our institute,” Managing Director Dirk Görlich is pleased to announce.

For most animals as well as for humans, losing a body part such as a foot or even ‘only’ a toe is a heavy blow: Once lost, they will never regrow. The flatworm *Schmidtea mediterranea* does not have this problem. This planarian, measuring only a few centimeters in length, is a master of regeneration and capable of renewing not only individual parts of its body but the entire organism. Even tiny tissue pieces as small as a couple of thousand cells have the ability to regenerate back into perfectly proportioned miniature planarians, complete with head, tail, and all internal organs. Thus, for good reason the worm is a popular model organism to investigate the secrets of regeneration.



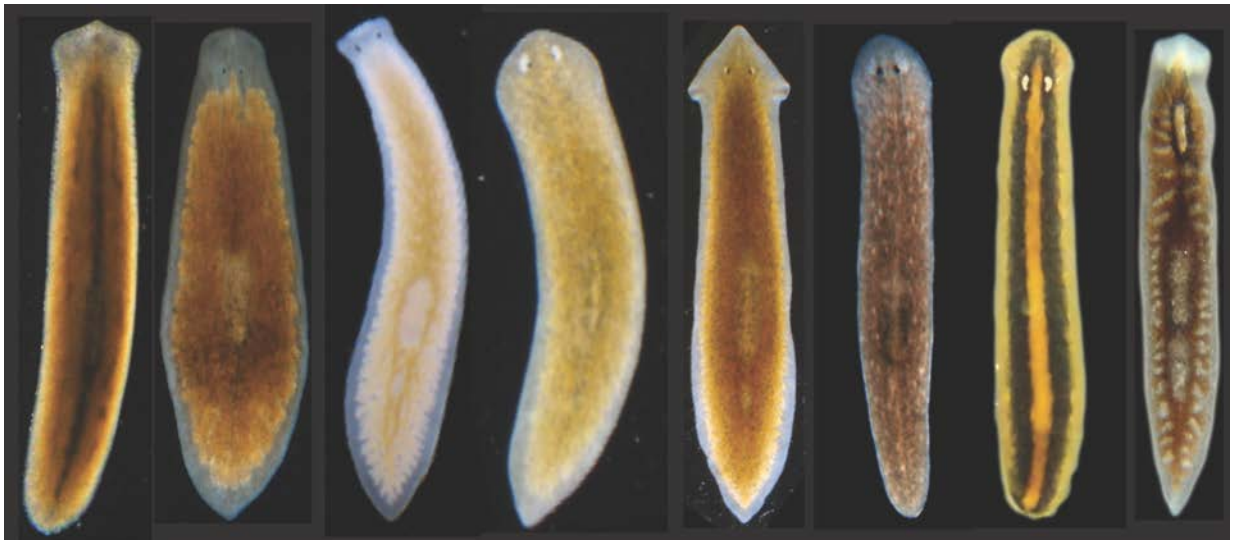
Cura pinguis, a planarian from Australia. This species has only limited head regeneration abilities.
(Photo: Miquel Vila-Farré / Rink lab)

A colorful planarian from Tasmania. It is a member of the genus *Spathula*, the exact species name is currently unclear.
(Photo: Miquel Vila-Farré / Rink lab)

“The fascinating regeneration potential of the worm raises numerous questions,” Rink explains. “How can a piece of tissue know which body parts are actually missing? How does it manage to restore the exact form and function of the missing parts? What are the signals that control cell proliferation and movement during regeneration? And why is the ability to regenerate an exception rather than the rule in the animal kingdom?”

To answer these questions, the new Max Planck Director applies various methods ranging from functional genomics, cell biology, and biophysics to taxonomy. Field research is also part of his work as he is constantly looking for new flatworm species for his planarian species collection, which comprises more than 60 species already. One of his plans is to establish a field research station at Lake Baikal in Russia. With more than 100 species that occur only in this body of water, the lake offers a unique diversity of flatworms. “Comparing different flatworm species is very exciting as their regeneration potential varies substantially. Regeneration-deficient species exist even amongst flatworms and the analysis of the underlying genetic differences promises interesting insights into the inner workings of regeneration and the evolution of the trait,” says Rink.

Together with his coworkers, the developmental biologist has already contributed ground-breaking findings in this research field: For example, they identified a crucial molecular switch, the so-called Wnt signaling pathway, which decisively influences the regeneration capacity. The flatworm species *Dendrocoelum lacteum* is usually unable to regenerate a head on a tail piece. But when



Flatworm species differ substantially in their regeneration capacity: Some can, for example, regrow their head while others cannot. *(Image: Miquel Vila-Farré / Rink lab)*

the scientists shut down the Wnt signaling pathway, such pieces were suddenly capable of regenerating a lost head. A surprising result, emphasizes Rink: “We had expected that we would need to manipulate hundreds of switches to influence a flatworm’s regeneration capacity, but this result showed that targeting of a single switch can suffice.”

Rink studied natural sciences at Cambridge University (England) and earned his PhD for research at the MPI for Cell Biology and Genetics in Dresden. From 2006 until 2010, he worked as a postdoc at the University of Utah in Salt Lake City (United States) before he returned to the Dresden MPI as Max Planck Research Group Leader in 2011. Since 2015, Rink is a member of the European Molecular Biology Organization’s prestigious EMBO Young Investigator program.

With Rink’s appointment, the MPI for Biophysical Chemistry now has twelve departments. It is thus one of the Max Planck Society’s largest institutes. (fk)

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