EDITORIAL

Dear Reader,

In many modern societies, individuality is very important – going your own way, even sometimes swimming against the tide. Life in a swarm is quite different: each member must keep a permanent eye on its neighbors and adapt its movements to the behavior of the others, otherwise the swarm will dissolve. Swarms exist in cells, in animals, and also in us humans. For many people, they are emblematic of disorder and chaos. But the individual swarm members actually follow strict rules. Researchers have now identified the most important ones: do what the others are doing and don't get too close to them.

Swarms seem to function as if by magic. They have no leaders. No one determines where they will go. Rather, individuals organize themselves. One example is the swarm-like associations of immune cells that overwhelm pathogens in the body. Messenger substances attract more and more cells. But how do swarms dissolve again? Researchers at the Max Planck Institute of Immunobiology and Epigenetics in Freiburg have now discovered the relevant signaling processes.

Huge schools of fish in the oceans are an impressive natural spectacle. At the Max Planck Institute of Animal Behavior in Constance, state-of-the-art technology is being used to analyze what keeps a swarm together and what advantages it offers. Fish-like swimming robots demonstrate how energy can be saved when swimming together.

However, there are also inherent dangers in so many individuals coming together, as shown by the crowd disasters at the Love Parade in Duisburg in 2010 or the Hajj pilgrimage in Mecca in 2015. Contrary to common belief, such tragic incidents are not caused by recklessness or religious fanaticism – the course of events follows the laws of physics. How to reduce the risk of such disasters is a topic at the Max Planck Institute for Human Development in Berlin.

Swarms are thus a multifaceted phenomenon and an increasingly relevant object for research. We hope you will get a real buzz out of reading our focus articles and the entire issue will provide you with a swarm of information!

Happy reading,

Your editorial team