
Tomáš Mackuľak: Expert in complex water monitoring and development of new environmental technologies

„We also work on the solutions for monitoring and detection of a wide range of both micro- and nano-plastics, micropollutant pathogens in various environmental compartments. The focus is mainly on hormones, contrast agents, pharmaceuticals, drugs, pesticides or their degradation products and metabolites.“



Foto: private

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Position: Director

I am an associate professor and a director at National Centre for Research on Microplastics and Micropollutants. Collaboration with practice is an integral part of my work and we develop it in several directions. For example, we are involved in the development of new types of innovative degradation and decontamination technologies, which are aimed at the possible replacement of mainly chlorinated agents. In this area, we cooperate with several water companies in Slovakia and in the Czech Republic, the ministries of Defence and Interior of the Slovak republic.

In addition, we are also engaged in the development of new types of biosensors applied in the form of tattoos (tattoo sensors) or disposable microsensors. In addition, we are also engaged in the development of nanotextiles that can be used in the production of, for example, self-cleaning protective suits, and research is also carried out in the field of SMART textiles aimed at the possible monitoring of basic human physiological functions. In this area, we also cooperate

with the Ministry of Defence of the Slovak Republic (Radiation, Chemical and Biological Protection Battalion) and the Ministry of the Interior of the Slovak Republic (NAKA). Wastewater monitoring forms an independent chapter of our research, where we are devoted both to the development of new types of technologies capable of removing the above-mentioned wide range of chemical and biological pollution and the subsequent use of treated wastewater in agriculture.

In the development of microsensors, online SMART wastewater monitoring and disinfection and decontamination technologies, we collaborate with more than 50 scientific institutions and partners from over 30 countries around the world, including the Massachusetts Institute of Technology (MIT), California Institute of Technology (Caltech), National University of Singapore (NUS), Stanford University, Imperial College London, Columbia University, New York University, etc.