

*Im Rahmen des Kolloquiums des Zentrums für Oberflächen- und Nanoanalytik spricht*

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*über*

## **Biocompatible materials in sensing**

The holy grail of personalized medicine is being able to monitor as many bodily functions as possible, from biophysical signals to biochemical markers. One of the key limitations remains the materials used that should adhere to the strict safety and sensitivity standards. In this talk, two approaches will be presented: functionalized graphene-based electrodes and resistive materials for electrical and electrochemical sensing, plasmonic nanostructures for Raman spectroscopy-based sensing, and their combination.

Graphene is highly flexible and biocompatible opening exciting prospects for bioelectronics. However, it lacks the bandgap necessary to create a complete elemental base for such a system. Graphene oxide, on the contrary, is dielectric and its reduction allows tuning its conductivity type and value. The talk will focus on carbon nanomaterials - graphene oxide, functionalized graphene. Their laser modification and nanoscale analysis, especially tip-enhanced Raman spectroscopy, and the proof-of-principle applications will be presented.

Surface-enhanced Raman spectroscopy is an approach that gives fingerprint capability for chemical sensing and also offering great sensitivity. The preliminary results of its adaptation to an *in vivo* environment will be given.

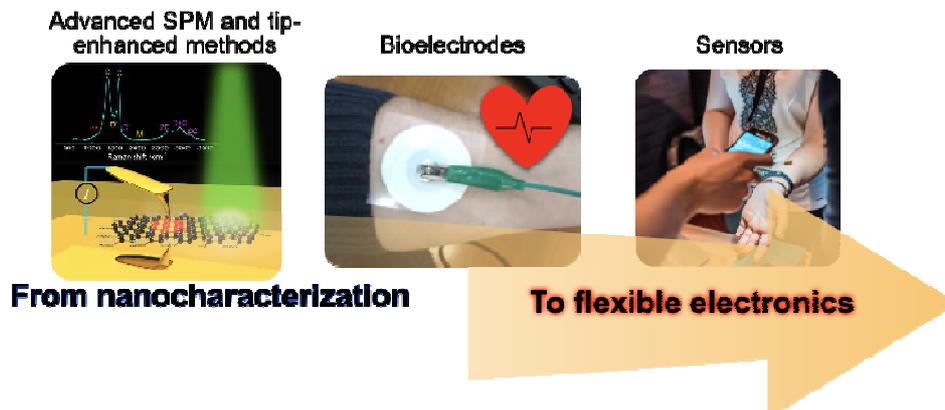


Figure 1. Overview of the topics covered, from nanocharacterization to sensors.

Evgeniya Sheremet is a professor at Tomsk Polytechnic University, Russia from 2017, where she is one of the co-founders of the TERS-team research group ([ters-team.com](http://ters-team.com)). In 2019 Prof. Sheremet received a national L'Oréal-UNESCO award for Women in Science. In 2011 she graduated from Novosibirsk State Technical University majoring in Nanotechnology and then made her Ph.D. and postdoctoral research in TU Chemnitz. Her main research focus concerns plasmonic and carbon nanomaterials.

