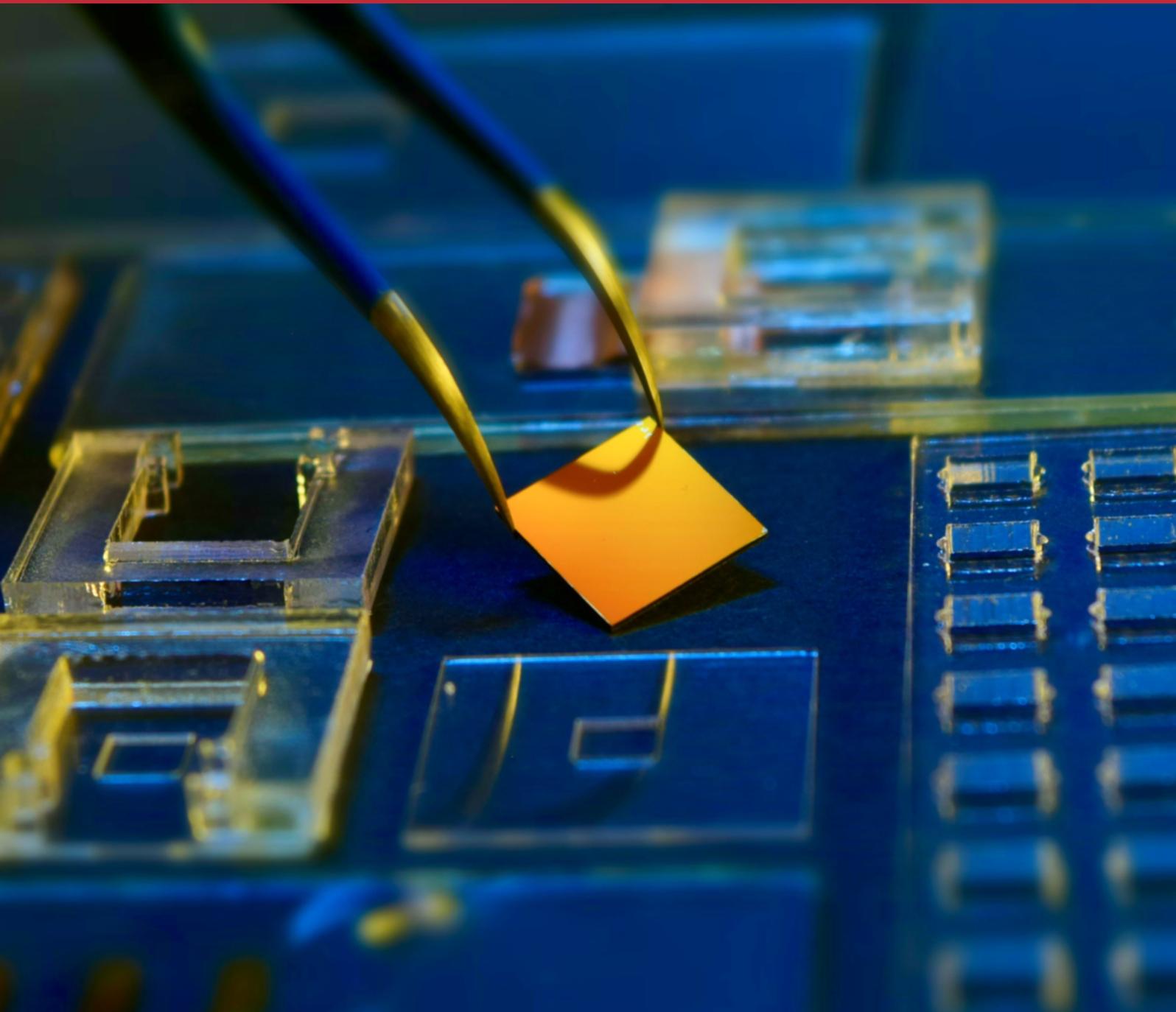


SERS-based sensing platforms for quantitative detection in liquid

Marlitt Viehrig
PhD Thesis



Popular science summary of the PhD thesis

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Title of the PhD thesis	SERS-based sensing platforms for quantitative detection in liquid
PhD school/Department	Department of Health Technology (PhD committee of Life Science)

Science summary

The development of robust, reproducible and sensitive analytical platforms for reliable detection of chemical and biological compounds is highly sought after for a wide range of applications in research and industry. Many of these applications have general implications for human health, including for example testing for antibiotics and toxins in foodstuff, detection of pharmaceuticals in urine and ensuring that your water is safe to drink.

Surface-enhanced Raman spectroscopy (SERS) is an optical sensing technology, which enables sensitive, specific and non-destructive analysis of target molecules. The technology relies on the close contact of target analytes with a nanostructured substrate for efficient detection. Components of real-life liquid samples, such as milk or urine, can hinder these target analyte – substrate interactions rendering the technology unsuitable as a standard analytical tool.

Analytical SERS-based sensing platforms for real-life applications, therefore, need to integrate efficient pretreatment of real-life samples with strategies to promote target analyte – substrate interactions. This work introduces and characterizes four different SERS-based quantitative analytical platforms for real-life liquid samples. Together with the latest developments of smaller and more affordable Raman systems, this work takes steps towards making SERS a standard analytical in numerous fields.