

INTERNATIONAL MICROFLUIDICS CONGRESS & International Conference on ADDICTION RESEARCH AND THERAPY

August 13-14, 2018
San Diego, USA



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Micro ESR: On chip magnetic resonance spectroscopy of microliter samples

Magnetic resonance spectroscopy is the gold standard for many analytical questions including structure determination or clinical imaging. However, magnetic resonance signals are inherently small and thus large sample volumes are required. Diamond magnetometry offers a solution to this problem. Making use of a fluorescent defect in diamond, the magnetic resonance signal is coupled to an optical signal. This optical signal can

be detected so sensitively, that it is even possible to sense the small magnetic field from a single electron. Here we use this new technology to create a chip system for electron spin resonance detection. To achieve the highest possible time resolution we also make use of a magnetic gradient on the chip. As a result one can obtain magnetic information within microseconds. The aim is to use this technique to follow chemical reaction and to visualize radical formation.

Biography

Romana Schirhagl has completed his PhD at the age of 24 years from Vienna University. She did her postdoctoral studies at Stanford University and ETH Zurich before she started her own group as an Assistant Professor at Groningen University. She has published over 50 scientific articles and has an excellent track record for obtaining funding. Most recently she received an ERC starting grant from the European Union.

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