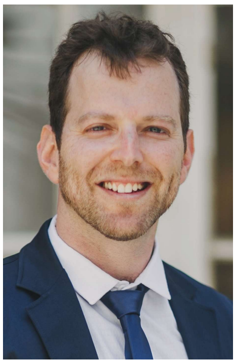
Center for Translational Imaging

MoMAN

universität ulm

28th MoMAN „From Molecule to Man" Seminar

Increasing MRI signal 10,000 times for enabling metabolic MRI and treatment assessment of cancer



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Abstract

Metabolic MRI using hyperpolarized 13C nuclei has become a popular tool for the in-vivo study of metabolic processes, and has been used for a variety of applications ranging from tumor treatment response to the study of heart disease. In this modality, endogenous metabolites have their MRI signal enhanced by several orders of magnitude (>10,000-fold), commonly referred to as hyperpolarization, and then injected into the patients. This dramatic signal increase enables real-time in-vivo detection of these metabolites, as well as their downstream metabolic products, a vital source of information for the detection and characterization of various diseases. While the achieved metabolic insights are crucial, so far this field has been limited by the method for achieving hyperpolarization, termed dissolution Dynamic Nuclear Polarization (d-DNP). This technology is prohibitively expensive, complex and slow. However, we have now achieved the required signal enhancement using an alternative approach utilizing a **quantum-pure state of hydrogen**, namely **parahydrogen**. By this approach we managed to polarize the metabolites at room temperature, in a fast, robust and cost-efficient manner. We have now kicked-off a large-scale German project (**QuE-MRT**), which includes Ulm University and Uniklinik Ulm as partners, to bring this technology to clinical trials in Germany. In this talk I will provide an overview of the technology, the foreseen applications, and the envisioned next steps.

When? **Monday October 10th 2022 at 4 pm**

Where? **Zoom (Meeting-ID: 621 5451 7629 | Kenncode: 19185717)**