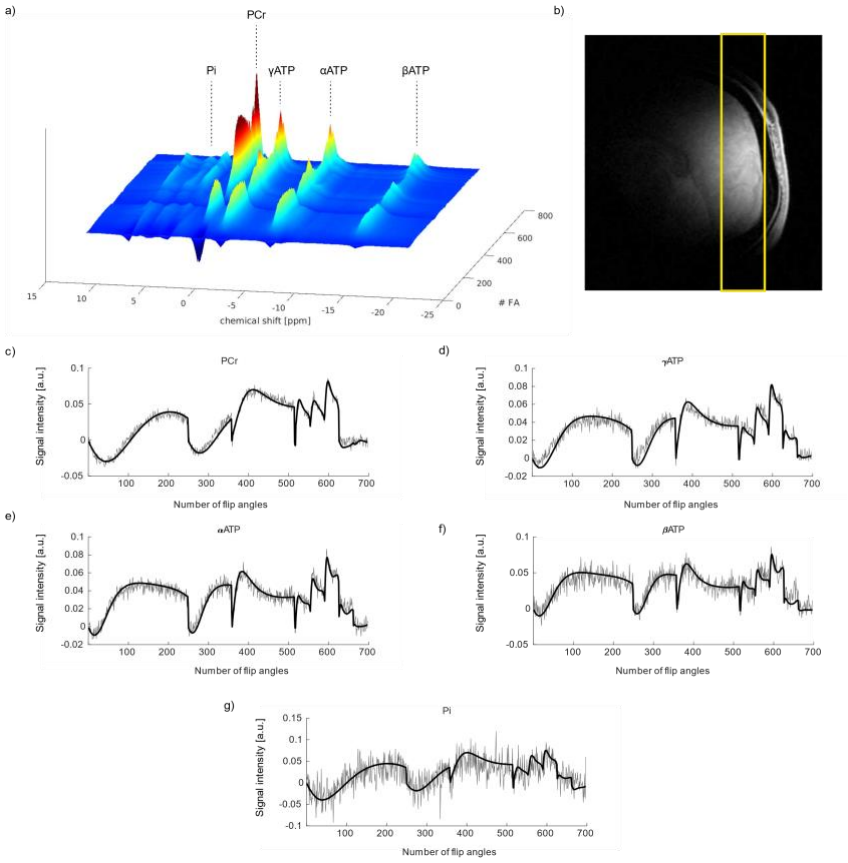
Master or Semester project

Location: EPFL, Lausanne
Dates: Autumn semester 2022, Spring/Autumn semester 2023

Fast metabolic imaging by magnetic resonance fingerprinting

^{31}P magnetic resonance spectroscopy allows the non-invasive measurement of various energy metabolites, physiological parameters and more interestingly dynamic information such as metabolic rates for ATP metabolism which is a key process in neuroenergetics for supporting normal brain function. The conventional magnetization transfer methods for ATP metabolism assay are time-consuming, which limits its application in a clinical setting. The newly developed ^{31}P magnetic resonance fingerprinting (MRF) methods has shown promising preliminary results for fast (8-fold acceleration) and precise quantification of creatine kinase forward rate in the human brain. Within this project, novel methods will be developed to optimize MRF acquisition and post-processing schemes based on simulations and in vivo measurements.



Skills:

Your qualifications, previous experience and background:

- Basic knowledge of MR physics.

- Programming skills in MATLAB, Python or C/C++ are required. Knowledge on machine learning or deep learning is a plus.

Supervisors:

- Prof. Dimitri Van de Ville, CIBM MRI EPFL-AIT
- Dr. Lijing Xin, CIBM MRI EPFL-AIT https://people.epfl.ch/lijing.xin
- Mark Widmaier, CIBM MRI EPFL-AIT

How to apply:

if you are interested to learn more about the projects, please contact: lijing.xin@epfl.ch

About CIBM

The CIBM Center for Biomedical Imaging was founded in 2004 and is the result of a major research and teaching initiative of the partners in the Science-Vie-Société (SVS) project between the Ecole Polytechnique Fédérale de Lausanne (EPFL), the Université de Lausanne (UNIL), Université de Genève (UNIGE), the Hôpitaux Universitaires de Genève (HUG) and the Centre Hospitalier Universitaire Vaudois (CHUV), with the generous support from the Fondation Leenaards and Fondation Louis-Jeantet.

CIBM brings together highly qualified, diverse, complementary and multidisciplinary groups of people with common interest in biomedical imaging.

We welcome you in joining the CIBM Community.

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