Abstract:

Sodium plays a vital role in our body. However, the increase of its concentration has been linked to several diseases, such as diabetes and hypertension. Sodium MRI can noninvasively detect the sodium signal, which can be calibrated to measure its absolute concentration. Yet, the detection of the sodium signal is challenging due to its low signal, which also decays very fast. Accordingly, the detected signal is significantly affected by its decay rate. Using a sodium MRI signal that is uncorrected for this decay results in an inaccurate concentration estimation. While several methods have been introduced to account for this confounding factor, they require a long acquisition time. In this seminar, we propose a fast and novel sodium data collection method to overcome the above challenges. We will demonstrate how an accelerated magnetic resonance spectroscopic imaging (MRSI) sequence may be used to simultaneously measure the decay rate of the sodium signal and its concentration with a spatial resolution of 2.5 x 2.5 x 20 mm.