



Allgemeines Physikalisches Kolloquium

Donnerstag, 21.05.2015 um 16 Uhr c.t.

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Relaxation processes in nuclear magnetic resonance for detection of cellular populations and their activity in vivo

The phenomenon of Nuclear Magnetic Resonance has found wide spread applications in science and medicine. NMR spectroscopy is an important analytical tool in all disciplines of chemistry and a powerful method in structural biology. Magnetic resonance imaging (MRI) has developed into the most versatile and widely used clinical diagnostic tool over the last three decades. Most structural information for calculation of molecular structures and also for image generation relies on relaxation phenomena in NMR. These allow for example detecting distinct cellular populations such as tumor cells in cancer, transplanted stem cells in cellular therapies, or bacteria causing an infection, in the living organism. Furthermore, physiological reactions may cause changes in relaxation behavior and thus become detectable by MRI. In this lecture I will briefly summarize the basics of MRI and NMR relaxation, and show how these phenomena can be used for cell tracking in a biomedical context. Imaging of neuronal function in the brain (fMRI) will be introduced and a multimodal approach to look at the brain at work will be presented.

