

EC COST B21
Physiological Modelling of MR Image Formation

WORKING GROUP 1 MEETING

VENUE

Regional Committee of Hungarian Academy of Sciences of Szeged

Szeged - Hungary

Friday, 18th March 2005



- 1) **J.R. Reichenbach** opened the scientific session of WG 1 and gave a brief overview of the agenda. Due to the short-termed cancellation and absence of two speakers at the meeting (E. Moser and O. Haraldseth), the original agenda had to be changed at the last minute.

- 2) **Scientific Presentations**

Roger Dommissé (B) gave an overview of high resolution neuroimaging of small animals, in particular anatomical and functional MRI of songbirds. Using Mn^{2+} as a paramagnetic MRI contrast agent and Ca^{2++} analogon, it is possible to monitor dynamically axonal transport, since Mn^{2+} enters the neurons. With this technique it is furthermore possible to monitor functional connectivity of different brain areas even dynamically and to explore the potential neuroplasticity taking place in these animals under a variety of influences, including seasonal and hormonal influences (breeding) or external stimuli (auditory stimuli).

Lothar Schad (D) presented techniques for the acquisition of ^{23}Na MR data on clinical scanners at field strengths of 1.5 T and 4 T, respectively. Using 3D radial k-space acquisition and optimized data reconstruction, it is possible to obtain ^{23}Na images of the brain or heart *in vivo*, even at a typical clinical field strength of 1.5 T. The potential as well as the limitations of ^{23}Na imaging and its associated technical problems were discussed and ways to overcome some of these problems were indicated, such as using ultrashort echo times with specially designed rf-pulses.

Jürgen Reichenbach (D) gave an overview of recent developments in susceptibility weighted imaging (SWI), including improvements in phase unwrapping and investigations of contrast changes due to the inductions of physiological changes by inhalation of carbogen or the intake of caffeine. Applications in volunteers and tumor patients were demonstrated. Using multi-echo approaches it is possible with this technique to extract physiologically important parameters, like venous blood volume or oxygen saturation, non-invasively with high spatial resolution.

19 March 2005

J.R. Reichenbach
Chairman of WG 1