

NEW DEVELOPMENTS IN MAGNETIC RESONANCE ELASTOGRAPHY (MRE)

Professor Neil Roberts
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2017. 9. 25 (월) 12:00~13:00

KAIST E3-1 전산학부 건물 4 층 오상수 영상 강의실

The mechanical properties of biological tissue provide information related to the strength and integrity of cellular microstructure and may be measured non-invasively using Magnetic Resonance Elastography (MRE), a particularly sensitive new medical imaging technique that may increase the potential for early diagnosis, study of physiology and detailed monitoring of response to treatment.

The various methods used for acquisition and analysis of MRE data will be described and illustrated in applications in the study of brain, muscle, liver, kidney and uterus. Predictions will be made regarding the trends for future research and applications of MRE.

Biography – Professor Neil Roberts

Professor Neil Roberts has 30 years experience in working in the field of Magnetic Resonance Imaging (MRI). He has a BSc in Physics, PhD in Applied Physics and MSc in Medical Physics and was recruited to establish an Image Analysis Laboratory to support a wide range of projects at a dedicated Magnetic Resonance Research Centre (MRRC) at the University of Liverpool, equipped with the UK's first commercially purchased Magnetic Resonance Imaging (MRI) system.

Professor Roberts subsequently pioneered the application of Modern Design Based Stereology and Computer Based Image Analysis in MRI and established his career as co-PI on two Medical Research Council (MRC) Programme Grants. This led to Professor Roberts being invited to become Director of the renamed Magnetic Resonance and Image Analysis Research Centre (MARIARC), whereupon he initiated and led a research programme in “*MR Studies of the Neural Bases of Cognition: Theoretical and Clinical Interactions*”. This work was underpinned by setting up of a Tertiary Referral Service for pre-surgical evaluation of patients with Temporal Lobe Epilepsy (TLE), in collaboration with the nearby Walton Centre for Neurology and Neurosurgery (WCNN), a joint research programme in functional neuroimaging with the Cognitive Neuroscience Centre in the School of Psychology, University of Bangor and a research programme in the application of Functional Neuroimaging in Consumer Science with Unilever Research, plc.

Presently Professor Roberts is Chair of Medical Physics and Imaging Science at the University of Edinburgh and a member of the Centre for Inflammation Research (CIR). In this role, In Edinburgh Professor Roberts has led the development of new programmes of research using a 3 T Magnetic Resonance Imaging (MRI) system. Most prominent among these is a research programme in Magnetic Resonance Elastography (MRE) that allows non-invasive measurement of tissue mechanical properties and which is supported by Research and Development Agreements with *Charité* - Universitätsmedizin Berlin, Germany, Mayo Clinic, Minnesota, USA and The Mentholatum Company, East Kilbride. Professor Roberts's group have pioneered new approaches to MRE data analysis and which are being applied in clinical studies of brain, muscle, kidney and uterus with colleagues in the College of Medicine and Veterinary Medicine (CMVM). Professor Roberts has also established important and productive International collaborations.