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In Vivo Imaging Epileptogenesis and Epilepsy: From Techniques to Applications

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Histologic analysis of tissue provides a snapshot of dynamic alterations that occur in the brain during epileptogenesis and ictogenesis. Recent advances in magnetic resonance imaging (MRI) have provided us useful tools to follow molecular and cellular alterations in individual animals over a period of time to understand the dynamics in neurobiology of epileptogenesis and ictogenesis. In addition, animal models, where the brain can be dissected out and analyzed, permit a direct examination of the cellular and molecular bases of the MRI signal changes. The present Workshop presents the latest advances in MR technology that can be used to understand the molecular and cellular alterations in animal models of epileptogenesis and epilepsy. Speakers also show practical examples how to apply MR imaging in animal models of epilepsy. Dr. Bulte will provide an overview of methodologies for MR molecular imaging of rodent brain (rats, mice) and critically assess the possibilities and limitations. Dr Grohn will discuss about the use of tract tracing to detect axonal plasticity in epileptogenic brain. He will also shortly review the current possibilities to image seizure spread. Dr. Baram will discuss imaging of epileptogenesis induced by experimental prolonged febrile seizures.

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