

HuMeNS*

Advanced Study Group on neuroscience of knowledge acquisition *Humanities, Medicine, Natural Science, Social Science

Background and Goal

The *HuMeNS* Advanced Study Group has been formed as a result of the members' mutual interest in carrying out interdisciplinary studies on the microstructure of human cognition, in particular studies on changes in the brain's cellular structure during language acquisition. The envisaged research program involves collaboration by researchers at four different faculties at Lund University: HT, N, M, S representing the fields of linguistics, physical chemistry, medical radiation physics and psychology, respectively. It is an outgrowth of a number of fruitful cross-disciplinary collaborations involving the Humanities and Medicine (*HuMe*) initiative, Lund University Bioimaging Center, the Chemical Center, the Humanities Laboratory, as well as active international collaborative efforts at all departments involved. These environments have created a unique opportunity for neurolinguists and neuropsychologists to join forces with researchers in physical chemistry, medical physics and diagnostic radiation physics and pose research questions about neurocognition that were unapproachable even a few years ago.

The goal of the *HuMeNS*-research program is to arrive at a better understanding of what changes take place in the brain's microstructure (at a cellular level) when language is acquired. Current non-invasive imaging techniques do not allow the study of the neural underpinnings of language structure at a level of spatial resolution smaller than a millimeter. Even though previous work measuring changes in e.g. cortical thickness during language learning has been insightful, we still know nothing about the underlying causes of the changes. Increase in cortical thickness could have several causes, such as angiogenesis, axon sprouting, or glial changes. Further, we know very little about the mechanisms involved when different cortical areas become connected via white matter tracts during language acquisition.

In order to attain our goal, we aim at developing new non-invasive Magnetic Resonance Imaging (MRI) methods that would allow investigation of changes that take place at the neuronal cell level. The results of the planned cross-disciplinary studies will have long-reaching implications for increasing our understanding of how new knowledge is represented in the brain on a cellular level. The outcome of the *HuMeNS*-collaborative work is expected to be important insights leading to better diagnosis and treatment of neurological diseases and syndromes affecting human cognition.

Events

The HuMeNS-Advanced Study Group will host an international symposium on:

'Microstructures of Learning: Novel methods and approaches for assessing structural and functional changes underlying knowledge acquisition in the brain' on **May 23, 2014**. The symposium will be free of charge, but registration is necessary. Please read more and register [here](#).