# Isolation of important centres in the brain results in age-related memory deficits

November 27 2014

Umeå centre for Functional Brain Imaging, Umeå University. Credit: Mikael Lundgren

Poor memory among the elderly can be explained by regions in the hippocampus complex, an important part of the brain, becoming more co-active during rest, thereby interacting less efficiently with other parts of the brain when we try to memorize information. These are the findings of a study published in the journal *PNAS* by researchers at

Umeå University, Sweden.

The brain's hippocampus system is important for our ability to learn and memorise new events. Previous studies have shown that there are age-related changes to hippocampus during rest, but exactly what these changes are and how they affect our memory have remained unknown. To study this issue, the researchers at Umeå University let 339 persons aged 25-80 years undergo resting-state fMRI, i.e. magnetic resonance imaging of their brain in a resting state.

The study, which is published in this week's issue of *Proceedings of the National Academy of Sciences*, *PNAS*, finds that the increased covariation among different parts of the hippocampus while resting is partially due to age-related changes to nerve fibers that connect hippocampus to other parts of the brain.

"What we can now show is that memory problems that come with increased age are most likely due to a process where the interaction among different regions of the hippocampus increases in response to less inhibitory cortical input. This in turn means that the hippocampus risks being more isolated from other important networks in the brain which impacts our ability to actively engage the hippocampus, for example to remember different events," says Lars Nyberg, Professor at Umeå University and Director for UFBI, who has headed the study.

The study is based on the Umeå-based Betula project.

**More information:** Salami, Pudas & Nyberg. Elevated hippocampal resting-state connectivity underlies deficient neurocognitive function in aging, *Proceedings of the National Academy of Sciences*, *PNAS*, 2014. DOI: 10.1073/pnas.1410233111

Provided by Umea University