



The Neural Correlate of Consciousness

Steven Laureys
University of Liège, Belgium

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Host: Hugo.Lagercrantz@ki.se

The Neural Correlate of Consciousness: Lessons from Coma and Related States

Steven Laureys

Coma Science Group, University of Liège, Belgium

www.coma.ulg.ac.be

Coma patients may awaken, being fully aware but paralyzed and mute, (i.e., they are in a locked-in syndrome). Recent neuroimaging and electrophysiology studies are illuminating the relationships between awareness and: (i) *global* brain function; (ii) *regional* brain function; (iii) changes in *functional connectivity*, and (iv) primary versus associative *cortical activation* in response to external stimulation -highlighting possible perception of pain and emotion.

In our view, conscious awareness is an emergent property of the collective behavior of neuronal ensembles in the frontoparietal global neuronal workspace. Within this thalamo-cortical network, recent studies in healthy volunteers have recently shown that external (sensory) awareness depends on lateral prefrontal and posterior parietal cortices while internal (self) awareness correlates with precuneal and mesiofrontal midline activity. Of clinical importance, this knowledge now permits to improve the diagnosis of patients with disorders of consciousness, which remains very challenging at the bedside.