**Studying urgency and arousal during decision making in humans**

J. Duqué

Humans and other animals make a wide range of decisions throughout their daily lives, with varying degrees of speed and precision. This variability is not only due to the amount of evidence based on which one makes decisions but also to the sense of urgency and the level of arousal that can vary between and within individuals, from one situation to another. My talk will focus on the work we have been doing lately to better understand mechanisms underlying urgency and the contribution of arousal during decision making. It will be divided into two parts. In the first section, I will describe a study in which we investigated the impact of urgency on motor neural activity, studied using transcranial magnetic stimulation (TMS) over primary motor cortex (M1) during decision making in an index finger variant of the Tokens task, originally developed for studies of urgency in non-human primates by D. Thura and P. Cisek. Then, in the second part of my talk, I will turn to a recent investigation of the role of the arousal system in decision making. Interestingly, it is possible to causally address the role of arousal in humans by means of transcutaneous Vagus Nerve Stimulation (tVNS), which employs electrical stimulation targeting the auricular branch of the vagus nerve to stimulate non-invasively the locus coeruleus noradrenergic system, one major source of arousal in the brain. I will present new behavioural data collected in the random dot motion discrimination task with 4 second-trains of online tVNS (compared to sham) and pupillometry.