

## Interoceptive and emotional processes in addictive disorders: Understanding the role of the insular system

### Summary

This project will propose a transdiagnostic exploration of the insular system and its associated psychological processes (i.e. interoceptive and emotional abilities) in substance-related (severe alcohol use disorder, SAUD) and behavioral (video gaming disorder, GD) addictive disorders.

Interoception, the processing of internal bodily states, mostly based on the insular system, has been recently proposed as a key process in the emergence and maintenance of addictive disorders, initiating an in-depth challenge for theoretical models and experimental approaches. The most striking illustration of this change relates to the renewal of dominant dual-process models, describing addictive disorders as being associated with an imbalance between an under-activated reflective system (relying on prefrontal regions and involved in controlled-deliberate behaviors) and an over-activated automatic system (relying on amygdala-striatum areas and involved in appetitive behaviors). This framework has received experimental support in SAUD and GD but the main assumption of the dual-process model, namely the presence of an imbalance between these systems (beyond their distinct alterations), remains to be experimentally tested. Centrally, little is known about the psychological processes and brain structures managing systems' communication and interactions. It has been recently proposed that the insular system might constitute a hub between reflective and automatic systems: as it is involved in the conversion of interoceptive information (e.g., bodily sensations) into subjective experiences (e.g., craving), it might play a central role in the activation of the automatic system (e.g., approach behaviors) and in the reduction of the cognitive resources related to the reflective system. To experimentally test this proposal and its transdiagnostic validity, three research axes will be conducted, respectively exploring: (1) the nature and extent of interoceptive deficits in SAUD and GD, as they remain largely underexplored; (2) the interactions between interoceptive and emotional processes, as the insular system is simultaneously involved in both abilities, and as emotional skills are strongly affected in addictive disorders; (3) the direct role of the insular system in the reflective-automatic systems' interconnections.

This project is supported by a four-year FNS – FNRS Research Grant (Lead Agency Scheme). While our project was funded, the FNS decided to fund only a 70% post-doc position for three years, instead of the full time post-doctoral position planned in our proposal. For the Swiss part of the project, conducted at UNIL, this full-time position is required in order to conduct the various studies of our project as planned. Accordingly, rather than diminishing the number of studies conducted or participants recruited, we have decided to apply for external funding to fund a full time post-doctoral position at UNIL (instead of the 70% currently funded by FNS), which we believe is compulsory to conduct the research project as planned. **The current application thus aims to finance a 30% post-doctoral position for 2 years, that will for the first two years of the project complement the 70% post-doctoral position granted by the Swiss FNS. If our application is successful, it will be possible for us to conduct the research project described here in its entirety.** In particular, the post-doc is essential for the work that will be conducted at UNIL. The post-doctoral researcher will be involved in recruiting and testing GD and control participants. The post-doctoral researcher, who is currently involved in the validation process of self-report and objective measures of interoception that will be used in this project, will also be involved in selecting and implementing the measurement instruments that will be used to assess interoception and related processes, and in supervising the data extraction and analyses conducted with these instruments. He will also be involved in obtaining ethical clearance for the studies conducted in Switzerland. Eventually, he will be involved in writing scientific papers related to the study.