Submitter Name: Olivier George
Submitted email: ogeorge@scripps.edu

The Oxycodone Biobank: A repository of biological samples from genetically characterized outbred rats that exhibit compulsive-like escalation of oxycodone self-administration

Olivier George[1], Lisa Maturin[1], Marsida Kallupi[1], Abraham Palmer[1], Leah Solberg Wood[1], and Giordano de Guglielmo[1]

[1]The Scripps Research Institute

Identification of the mechanisms underlying compulsive oxycodone use in animal models is a major goal for understanding the genetic risk factors for oxycodone use disorder and facilitating the identification of novel druggable targets. A key issue for the field is the lack of a repository that contains biological samples from behaviorally and genetically characterized rats. We introduce the Oxycodone Biobank (www.oxycodonebiobank.org), a repository of biological samples from a unique, genetically diverse strain of outbred heterogeneous stock (HS) rats that have been behaviorally and genetically characterized using next-generation sequencing, state-of-the-art behavioral screening, and a variety of preservation techniques. Male and female rats are trained to self-administer oxycodone (0.15 mg/kg/inf) in daily 12 h sessions. Addiction-like behaviors are evaluated using an Addiction Index that incorporates the key criteria of opioid-use disorder: escalated intake, compulsive-like responding, and hyperalgesia. Results showed high individual variability with vulnerable and resistant rats that is likely to facilitate the detection of gene variants and the molecular and cellular mechanisms of addiction. Preservation techniques include perfusion, snap-freezing, and cryopreservation to maximize the compatibility of this tissue bank with cellular, molecular, and anatomical methods. The Oxycodone Biobank provides free access to over 20 organs. The use of the Cocaine Biobank has the potential to have a sustained impact on the field of addiction because they will identify novel druggable targets, provide a comprehensive analysis of compulsive cocaine use in both males and females, and provide a unique data/tissue repository that will facilitate follow-up and replication studies.