Laboratory title : CNRS UMR 5287 - Jean-René Cazalets

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Thesis title :
Nicotine addiction in adolescents: role of the interaction between the dopaminergic and endocannabinoid systems

Keywords : addiction, nicotine, adolescence, dopamine, endocannabinoids

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Abstract

Statistics show that adolescents are very likely to initiate tobacco use and are more susceptible to long-term tobacco addiction (MILT 2013) supposedly because they are more responsive to nicotine (the main addictive compound of tobacco) reinforcement and less to its aversive effects. However, pharmacological aids failed to treat nicotine dependence in ado. Thus, we need to better understand the mechanisms underpinning increased addiction liability in adolescents. The main objective of the PhD. project is to characterize in adolescent, the nicotine-induced adaptations occurring within the dopaminergic system in the ventral tegmental area (VTA), a key structure mediating nicotine reinforcing properties. Moreover, we have shown in previous work that the endocannabinoid system (EC) within the VTA controls nicotine taking (Simonnet et al, 2012) and seeking behaviors. The project in adolescents’ subjects will have 3 aims: i) characterize behavioral adaptations to nicotine in adolescents and underlying alterations of the DA neurons; ii) examine the role of EC in the effects of nicotine; and iii) determine whether adaptations of adolescent VTA DA neurons are involved in the gateway nicotine effects of nicotine to cannabis use. These studies are to further explore the use of endocannabinoid-based pharmacotherapy for the treatment of nicotine dependence more specific to the adolescent cohort.

Methodology : Behavioral pharmacology in rats and transgenic mice (models of addiction) combined with the study of the underlying neurobiological substrates (use of viruses, cellular imaging, western blot and electrophysiology).

Qualification required

Knowledge in neurosciences. Interest for multidisciplinary approaches in rodents