**Involvement of the microbiota in the development of food addiction**

Previous studies conducted in our laboratory reveal that long-term exposure to palatable food leads to loss of control over food intake. Indeed, a novel animal model of food addiction in mice was validated and long-term daily operant training with highly palatable food promoted a loss of control over food seeking in spite of the negative consequences, extremely high motivation for this palatable food and persistence of food seeking in spite of the non-availability of the food (Mancino et al., 2015). These behavioral responses promoted by palatable food were similar to those reported in DSM-5 to define substance use dependence and in the YFAS 2.0 to diagnose food addiction providing a novel behavioral model to investigate in mice the still unresolved topic of food addiction. Recently, we have revealed that the lack of cannabinoid type 1 (CB1) receptor in dorsal telencephalic glutamatergic neurons prevents the development of food addiction, which is associated with enhanced synaptic excitatory transmission in the medial prefrontal cortex (mPFC) and in the nucleus accumbens (NAc). Additionally, by using a DREADD approach, we have demonstrated that inhibition of neuronal activity in the mPFC-NAc pathway induces loss of control and compulsive food seeking in mice (Domingo et al. 2020). However, the exact mechanisms to explain why some individuals are vulnerable and develop food addiction while others are resilient and do not remains still elusive. It is expected that several protective factors can prevent the development of food addiction even in vulnerable individuals considering the involvement of multiple gene networks and environmental factors. Thus, the study of the composition of microbiota and its influence in neuronal plasticity is an excellent candidate for the study of the prevention to develop food addiction. The study of the relationship between microbiota and food addiction is of great novelty and interest and would suppose a great advance to find effective treatments to prevent the development of compulsive behaviors.

References

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