

**Topic category:** Others

## **Alcohol Intoxication Modifies the Phase and Coupling of Circadian Rhythms**

Noemi Méndez-Díaz<sup>1</sup>, Rosa Elvira Núñez-Anita<sup>2</sup>, Iván Villanueva<sup>1</sup>

<sup>1</sup>Departamento de Fisiología, Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional, Ciudad de México, México. <sup>2</sup>Facultad de Medicina Veterinaria y Zootecnia, Universidad Michoacana de San Nicolás de Hidalgo, Michoacán de Ocampo, México.

**Introduction:** In mammals, the circadian rhythms of the diverse physiological variables are maintained by local tissue oscillators. These secondary oscillators are coordinated by central oscillators and are kept functionally coupled by nervous and hormonal signals. The impairment of the communication between oscillators causes the rhythms of different tissues to desynchronize from each other. Ethanol affects the neuronal GABAergic activity, so that it has a general inhibitory effect on the nervous functions. We propose that intoxication with ethanol affects the communication and integration between oscillators, thus modifying the general circadian rhythmicity and the coupling of local rhythms.

**Objective:** This work evaluates the effects of acute alcohol intoxication on circadian rhythmicity in rats.

**Material and Methods:** Ethanol (200 mg/dL) was administered at two moments of the circadian cycle (ZT 11 and ZT 23) to a group of Wistar rats maintained in a 12:12 h light/dark cycle, and the circadian rhythms of activity and food consumption were analyzed for the following three cycles under constant darkness.

**Results:** Alcohol produced a significant shortening of the period along with a delay of the acrophase of the activity rhythm when applied at the beginning of the active phase but not at the beginning of the rest phase. The rhythm of food intake was affected similarly but to a lesser extent.

**Conclusions:** These results indicate that alcohol intoxication has the potential to alter the endogenous circadian rhythmicity, and that the intensity of this effect varies according to the moment of the endogenous cycle in which it occurs.

**Keywords:** alcohol intoxication, circadian rhythm, wistar rats,

**Supported by** grant SIP-20161989, IPN.