

## **Seminar**

### **The paradoxical impact of ethanol on memory consolidation**

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We spend about a third of our lives asleep, yet the purpose of sleep remains elusive. Once dismissed as a passive or “death-like” state, sleep is now recognised as essential for numerous biological processes, including cognitive functions. While sleep is considered essential for memory consolidation, its function is remarkably adaptable to an animal's physiological state and environment. Using *Drosophila*, we previously established that satiated flies require sleep to form memories but switch to a sleep-independent memory pathway when starved. We further identify reward signalling as a key mediator of this state-dependent cognitive flexibility. In this talk, I will discuss our recent work on how ethanol, a potent pharmacological reward that can override natural reward-seeking, influences the role of sleep in memory consolidation. Acute ethanol selectively affects memory processing through the sleep-dependent pathway, while leaving the sleep-independent memory pathway intact. Notably, ethanol induces a switch from sleep-dependent to sleep-independent memory consolidation, analogous to the circuit-level adaptation observed in starved flies. However, this switch in memory pathways is rendered ineffective, as ethanol-induced sedation suppresses the consolidation process. These findings reveal a paradoxical dual impact of ethanol, triggering a switch to the sleep-independent memory pathway but simultaneously disrupting memory consolidation, thereby decoupling sleep from its canonical role in memory consolidation.

***Thursday, Dec 4<sup>th</sup> 2025***

***16:00 Hrs (Tea / Coffee 15:45 Hrs)***

***Auditorium, TIFRH***