XL SAN
meeting
e-book

Ciudad Universitaria
Universidad de Buenos Aires
October 1st – 5th
2025

Organizing Committee

Macarena Amigo Duran
María José Bellini
Mariano Belluscio
María José De Rosa
Martín Klappenbach
Sonia Jazmín Molina
Malena Lis Mul Fedele
Alejandra Pacchioni
Diego Rayes
Lucca Salomon
Camila Scorticati
Andrés Pablo Varani
Lidia Szczupak

S-014

Antagonistic Monoaminergic Control of State-Dependent Foraging in C. elegans

Maria Gabriela Blanco[1,2], Ailin Lacour[1,2], Jeremy Florman[3], Maria Jose De Rosa[1,2], Mark Alkema[3], Diego Rayes[1,2]

1. Instituto de Investigaciones Bioquímicas de Bahía Blanca
2. Universidad Nacional del Sur
3. UMASS-Chan Medical School

Presenting Author:
Ailin Lacour
ailin.lacour@gmail.com

The perception of food as more rewarding after deprivation is an evolutionarily conserved phenomenon, yet its underlying neural mechanisms remain poorly understood. We dissect this process using the nematode C. elegans, a model organism with a well-defined nervous system and conserved neurochemistry that provides universal insights into state-dependent behaviors.

In C. elegans, fasting triggers an enhanced slowing response upon food re-encounter, ensuring efficient exploitation of the source. We demonstrate that this behavior is governed by an antagonistic relationship between serotonin (5-HT) and tyramine (TA, the invertebrate analog of noradrenaline). The fasting-induced decline in TA disinhibits serotonergic signaling, which primes serotonergic neurons for a heightened response. Consequently, upon encountering food, these neurons release a surge of 5-HT that dramatically slows locomotion to ensure efficient feeding. This mechanism is confirmed in TA-deficient mutants, which exhibit hyperactive serotonergic neurons and an exaggerated slowing response. We further establish that TA directly inhibits the NSM neuron through the activation of two adrenergic-like GPCRs.

This defines a neural switch where fasting reduces inhibitory monoamines, disinhibiting 5-HT to ensure feeding. Conservation of these neurotransmitters suggests similar principles govern state-dependent decisions across species, providing insight into foraging and appetite.