

Joint Seminar by IQCB & iDN

December 11, 2025

12:00 noon

Lecture Hall (00.187) at BioZentrum I, Hanns-Dieter-Hüsch-Weg 15, 55128 Mainz

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Social Modulation of Neural Function in *Drosophila*

Learning from social feedback is essential for flexible behavior across species, and deficits in such flexibility can impair social well-being. To investigate the neural basis of social flexibility, we studied male *Drosophila melanogaster*, a genetically accessible model for dissecting social behavior. Building on evidence that past social experience shapes male courtship strategies (Roemschied et al., biorxiv 2025), we developed a quantitative framework to test how social feedback retunes neural circuits to support strategy switching.

We engineer controlled social feedback by pairing males with females whose responses to courtship are altered in real time. Using identity tracking, we deliver precisely targeted optogenetic stimulation to the female to steer her behavior while leaving the male unstimulated—allowing unbiased downstream characterization of the male's circuitry. After this controlled experience, we map how social history reshapes neural computations in the male using optogenetic probing with stochastic stimuli combined with automated, repertoire-wide behavioral classification.

Applying this approach across sensory, central-brain, and premotor neuron classes reveals level-specific modulation: social experience does not broadly change excitability or motor output, but selectively retunes computations at the sensory-to-brain interface, reshaping how social cues are transformed into decisions and actions.

Host: Prof. Dr. Marion Silies



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