

"Neural Circuits of Addiction and Reward" Journal Club

Please email Lieselot and/or Nick to be added to the mailing list

Organizers: Lieselot Carrette, lcchette@health.ucsd.edu, and Nick Hollon, ngollon@health.ucsd.edu (Founded by Shelley Warlow, organizer 2020-2024)

When/Where: 1st Thursday of each month, 4-5 pm ; on the BRF 2nd floor balcony (or to-be-announced inside room in case of bad weather).

What: Group discussion of journal articles that cover neural circuits relevant to addiction and reward, and related fields (i.e, aversion, social behavior, other neuropsychiatric disorders, and motivation in general).

***In our current presentation-free format, everyone reads and brings their copy and thoughts to the discussion.** (Also ok to attend, listen in & participate even if you didn't read the whole paper, but please try to read & join if you can)*

Who: Faculty, postdocs, grad students, staff, and undergraduate lab members from multiple UCSD/Salk/Scripps labs are all invited to attend. Trainees (postdocs, grads, postbacs, undergraduate lab members) are especially encouraged to participate in the discussion & ask questions.

Format: A casual discussion format, rather than lecture/presentation-based, in an effort to a) encourage engaging discussion and respectful critique of peer-reviewed research, and to b) allow opportunities for trainees to have open discussion with peers and faculty.

A list of potential papers is added to this document (see page 6). If you are particularly interested in one or want to nominate another paper to discuss, pin it to a meeting in the calendar (on page 2+, and let Lieselot & Nick know too so we'll be sure to see your suggestion).

Reminders will be sent out a week before with the selected paper, so everyone can read it and bring it with questions and comments to the discussion. Socializing before and/or after is highly encouraged too, if your schedule allows...

2021-2024 Calendar for in-person meetings (1st Thursday of the month, 4-5 PM)*

Date	Paper	Location	
10/14/21	(Domi et al. 2021) A neural substrate of compulsive alcohol use	BRF2 3rd floor balcony	
*11/18/21 *now on 11/18 because of Veteran's Day holiday	(Kutlu et al. 2021) Dopamine release in the nucleus accumbens core signals perceived saliency	BRF2 3rd floor balcony	
12/9/21	(Gong et al. 2021) Cocaine shifts dopamine D2 receptor sensitivity to gate conditioned behaviors	BRF2 Room 2A03	
1/13/22	(Castro et al. 2021) An endogenous opioid circuit determines state-dependent reward consumption	Zoom: https://uchealth.zoom.us/j/672434487?pwd=dGdMZxh4OU1leVZKaVNZQkNuT0F3Zz09 Password: 064517	
2/10/22	(Strickland et al. 2021) Foot shock facilitates reward seeking in an experience-dependent manner	Zoom: https://uchealth.zoom.us/j/672434487?pwd=dGdMZxh4OU1leVZKaVNZQkNuT0F3Zz09 Password: 064517	
3/10/22	CANCELLED		
4/14/22	(Kreifeldt et al 2022) Central amygdala corticotropin-releasing factor neurons promote hyponeophagia but do not control alcohol drinking in mice	BRF2 3rd floor balcony	

5/05/22	(Stowe et al 2022) Diurnal rhythms in cholinergic modulation of rapid dopamine signals and associative learning in the striatum	BRF2 2A03	
6/9/22	(Waung et al 2022) A diencephalic circuit in rats for opioid analgesia but not positive reinforcement	BRF2 2nd floor balcony	
Summer 2022	CANCELED	Will return in Fall 2022	
10/6/2022	(Georgiou et al, 2022) Experimenter's sex modulates mouse behaviors and neural responses to ketamine via corticotropin releasing factor	BRF2 2nd floor balcony	
11/3/2022	(Simmler et al, 2022) Dual action of ketamine confines addiction liability	BRF2 2nd floor balcony	
12/1/2022	CANCELED		
01/05/2023	(Scheggia et. al. 2022) Reciprocal cortico-amygdala connections regulate prosocial and selfish choices in mice	conference Room 2103 (second floor in BRFII)	
02/02/2023	(Kruyer et. al 2021) Astrocytes in the ventral pallidum extinguish heroin seeking through GAT-3 upregulation and morphological plasticity at D1-MSN terminals	BRF2 2nd floor balcony	
03/02/2023	(Elias et. al. 2023) Touch neurons underlying dopaminergic pleasurable touch and sexual receptivity	BRF2 2nd floor balcony	
04/06/23	(Yang et. al. 2023) Phosphorylation of pyruvate	BRF2 2nd floor balcony	

	dehydrogenase marks the inhibition of in vivo neuronal activity		
05/04/23	(Bakhurin et al, 2023) Force tuning explains changes in phasic dopamine signaling during stimulus-reward learning	BRF2 2nd floor balcony	
6/01/23	(Markowitz et al, 2023) Spontaneous behavior is structured by reinforcement without explicit reward	BRF2 2nd floor balcony	
7-8/23	SUMMER BREAK		
9/7/23	(Soden et al, 2023) Circuit coordination of opposing neuropeptide and neurotransmitter signals	BRF2 2nd floor balcony	
10/5/23	(Roeser et al, 2023) Dopaminergic error signals retune to social feedback during courtship	BRF2 2nd floor balcony	
11/2/23	(Montgomery et. al.) Chemogenetic activation of CRF neurons as a model of chronic stress produces sex-specific physiological and behavioral effects	BRF2 2nd floor balcony	
12/7/23	(Carrette et. al.) Antagonists of the stress and opioid systems restore the functional connectivity of the prefrontal cortex during alcohol withdrawal through divergent mechanisms	BRF2 2nd floor balcony	
1/4/24	NEW YEAR - cancelled		
2/8/24 (*note week 2)	Cancelled		

3/7/24	GLP-1 receptor agonists are promising but unproven treatments for alcohol and substance use disorders	BRF 2nd floor balcony	
5/2/24	Opioid receptor expressing neurons of the central amygdala gate behavioral effects of ketamine in mice	BRF 2nd floor balcony	
6/6/24	Distinct μ-opioid ensembles trigger positive and negative fentanyl reinforcement	BRF 2nd floor balcony	
9/5/24	An Implantable device for wireless monitoring of diverse physio-behavioral characteristics in freely behaving small animals and interacting groups from the Golden, Good, and Rogers groups	BRF 2nd floor balcony	
10/3/24	Gowrishankar et al. 2024 Endogenous opioid dynamics in the dorsal striatum sculpt neural activity to control goal-directed action	BRF 2nd floor balcony	
11/7/24	An orbitocortical-thalamic circuit suppresses binge alcohol-drinking”	BRF 2nd floor balcony	
12/5/24	Opponent control of reinforcement by striatal dopamine and serotonin	BRF 2nd floor balcony	

02/06/25	Kuhn et. al “Distinct Behavioral Profiles and Neuronal Correlates of Heroin Vulnerability Versus Resiliency in a Multi-Symptomatic Model of Heroin Use Disorder in Rats	BRF 2nd floor balcony	
03/06/25	Aboharb et. al. Nature Communication 2025 “Classification of psychedelics and psychoactive drugs based on brain-wide imaging of cellular c-Fos expression”	BRF 2nd floor balcony	
4/3/25	Sun, Wu, & Hong (2025). A neural basis for prosocial behavior toward unresponsive individuals. Science	BRF 2nd floor balcony	
5/1/25	Grafelman (2025) Aversion-induced dopamine reductions predict drug-taking and escape behaviors. Neuropsychopharm	BRF 2nd floor balcony	
6/5/25	Soler-Cedeno (2025) “RDS-04-010: a novel atypical DAT inhibitor that inhibits cocaine taking and seeking and itself has low abuse potential in experimental animals”	BRF 2nd floor balcony	
10/2/25	Li (2025) “Synaptic sign switching mediates online dopamine updates.”	BRF 2nd floor balcony	

Circuits of addiction journal club: potential paper-list

<https://www.nature.com/articles/s41467-021-27092-z>

<https://www.nature.com/articles/s41386-021-01196-y>

<https://www.nature.com/articles/s41586-021-04013-0>

<https://www.sciencedirect.com/science/article/abs/pii/S0166432820306732?via%3Dihub>

[https://www.cell.com/cell/fulltext/S0092-8674\(21\)01334-9?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867421013349%3Fshowall%3Dtrue](https://www.cell.com/cell/fulltext/S0092-8674(21)01334-9?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867421013349%3Fshowall%3Dtrue)

Kruger, A., Dixon, D., Angelis, A. *et al.* Astrocytes in the ventral pallidum extinguish heroin seeking through GAT-3 upregulation and morphological plasticity at D1-MSN terminals. *Mol Psychiatry* (2021). <https://doi.org/10.1038/s41380-021-01333-5>

Bordier, Cecile, Georg Weil, Patrick Bach, Giulia Scuppa, Carlo Nicolini, Giulia Forcellini, Ursula Pérez-Ramírez, *et al.* 2021. “Increased Network Centrality of the Anterior Insula in Early Abstinence from Alcohol.” *Addiction Biology*, August, e13096.

Guercio, Leonardo A., Mathieu E. Wimmer, Heath D. Schmidt, Sarah E. Swinford-Jackson, R. Christopher Pierce, and Fair M. Vassoler. 2020. “Deep Brain Stimulation of the Infralimbic Cortex Attenuates Cocaine Priming-Induced Reinstatement of Drug Seeking.” *Brain Research* 1746 (November): 147011.

Haaranen, Mia, Annika Schäfer, Vilja Järvi, and Petri Hyytiä. 2020. “Chemogenetic Stimulation and Silencing of the Insula, Amygdala, Nucleus Accumbens, and Their Connections Differentially Modulate Alcohol Drinking in Rats.” *Frontiers in Behavioral Neuroscience* 14 (November): 580849.

Hultman, Rainbo, Kyle Ulrich, Benjamin D. Sachs, Cameron Blount, David E. Carlson, Nkemdilim Ndubuizu, Rosemary C. Bagot, *et al.* 2018. “Brain-Wide Electrical Spatiotemporal Dynamics Encode Depression Vulnerability.” *Cell* 173 (1): 166–80.e14.

Lee, Joo Han, Efrain A. Ribeiro, Jeongseop Kim, Bumjin Ko, Hope Kronman, Yun Ha Jeong, Jong Kyoung Kim, *et al.* 2020. “Dopaminergic Regulation of Nucleus Accumbens Cholinergic Interneurons Demarcates Susceptibility to Cocaine Addiction.” *Biological Psychiatry* 88 (10): 746–57.

Puaud, Mickaël, Alejandro Higuera-Matas, Paul Brunault, Barry J. Everitt, and David Belin. 2021. “The Basolateral Amygdala to Nucleus Accumbens Core Circuit Mediates the Conditioned Reinforcing Effects of Cocaine-Paired Cues on Cocaine Seeking.” *Biological Psychiatry* 89 (4): 356–65.

Torruella-Suárez, María Luisa, Jessica R. Vandenberg, Elizabeth S. Cogan, Gregory J. Tipton, Adonay Teklezghi, Kedar Dange, Gunjan K. Patel, *et al.* 2020. “Manipulations of Central Amygdala Neurotensin Neurons Alter the Consumption of Ethanol and Sweet Fluids in Mice.” *The Journal of Neuroscience: The Official Journal of the Society for Neuroscience* 40 (3): 632–47.

Wang, Yingqi, Yan Pan, Zhangyin Cai, Chao Lei, Xinli Guo, Dongyang Cui, Yu Yuan, Bin Lai, and Ping Zheng. 2021. “Inputs from Paraventricular Nucleus of Thalamus and Locus

Coeruleus Contribute to the Activation of Central Nucleus of Amygdala during Context-Induced Retrieval of Morphine Withdrawal Memory." *Experimental Neurology* 338 (April): 113600.

Weera, Marcus M., Rosetta S. Shackett, Hannah M. Kramer, Jason W. Middleton, and Nicholas W. Gilpin. 2021. "Central Amygdala Projections to Lateral Hypothalamus Mediate Avoidance Behavior in Rats." *The Journal of Neuroscience: The Official Journal of the Society for Neuroscience* 41 (1): 61–72.

Past zoom meetings in 2020-2021

"Neural Circuits of Addiction and Reward" Journal Club

Monthly; Fridays 11am-12pm

Recurring Zoom Meeting ID: 672 434 487 Password: 064517

<https://ucsd.zoom.us/j/672434487?pwd=dGdMZxh4OU1leVZKaVNZQkNuT0F3Zz09>

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Date	Presenter	Paper (Title/Link)	Discussion Leader
4/10/20	Shelley Warlow	Abstinence-dependent dissociable central amygdala microcircuits control drug craving	-----
4/24/20	Lourdes Fernandez de Cossio	Dopamine D2 receptors in discrimination learning and spine enlargement	Shelley Warlow
5/8/20	Scott Conrad	Medial habenula cholinergic signaling regulates cocaine-associated relapse-like behavior	Lourdes Fernandez de Cossio
5/22/20	Ege Yalcinbas	Local D2- to D1-neuron transmodulation updates goal-directed learning in the striatum	Scott Conrad
6/5/20	Sarthak Singhal	Nucleus accumbens medium spiny neurons subtypes signal both reward and aversion	Ege Yalcinbas
6/19/20	Lieselot Carrette	Thirst regulates motivated behavior through modulation of brainwide neural population dynamics	
7/17/20	CANCELLED		
8/14/20	Alicia Avelar	https://www.nature.com/articles/s41467-020-16407-1 The central amygdala recruits mesocorticolimbic circuitry for pursuit of reward or pain	

9/11/20	Lucie Oriol	https://www.nature.com/articles/s41386-019-0378-8	Alicia Avelar
10/9/20	Kokila Shankar	Distinct dopamine circuits transmit the reinforcing and anxiogenic effects of nicotine	
11/13/20	Shelley Warlow	Dissecting the role of GABA neurons in the VTA vs SNR in Opioid reward	
12/11/20	Scott Conrad	Dorsal Raphe Dual Serotonin-Glutamate Neurons Drive Reward by Establishing Excitatory Synapses on VTA Mesoaccumbens Dopamine Neurons	Shelley Warlow
1/8/21	CANCELLED		
2/5/21	Alicia Avelar	https://elifesciences.org/articles/65697 (main paper) https://www.sciencedirect.com/science/article/pii/S0092867421000118 (second paper for additional discussion)	Scott Conrad
3/5/21	Lieselot Carrette	Orchestrating Opiate-Associated Memories in Thalamic Circuits	
4/2/21	CANCELLED		
5/7/21	Sarthak Singhal	Periaqueductal Gray and Rostromedial Tegmental Inhibitory Afferents to VTA Have Distinct Synaptic Plasticity and Opiate Sensitivity	
6/4/21	Lieselot Carrette	A whole-brain imaging-based systems approach to understand origin of addiction in	

		binge-like drinking model	
Summer 2021	CANCELLED	Will return in Fall 2021	