

IBANGS News

Summer 2021, Issue 12

Genes, Brain and Behavior 2021



The 1st virtual GBB meeting was a huge success thanks to the hardwork and dedication of many people. Given the record attendance and the participation of scientists from a large number of countries, our future meetings will most likely always include a virtual component primarily to provide a way so that everyone is able to participate regardless of geographical location and schedule constraints.

Here are some highlights

The IBANGS Distinguished Investigator and Early Career Achievement Award Seminars are available for viewing via our YouTube channel.

Distinguished Investigator Award

Abraham Palmer

https://www.youtube.com/watch?v=QRBlgAOq_jl



Early Career Achievement Award

Ryan Logan

<https://www.youtube.com/watch?v=QJRDjg6tHVY&lc=UgxHtiP7Ox6Hjiv-tQh4AaABAg>



IBANGS Fellows named (Finally!)

The IBANGS Fellow appointment was implemented in 2019 and is given to individuals that have demonstrated scientific excellence, and support of the society through service on committees and continuous membership for a number of years.

Due to the cancellation of the 2020 annual meeting, the announcement was put on hold until this year. Fortunately, several Fellows were in attendance. From left to right: John Crabbe, Jackie Crawley, Wim Crusio, Abe Palmer, and Catharine Rankin



A warm congratulations to all of the IBANGS Fellows.

Richard E. Brown
Elissa J. Chesler
John C. Crabbe
Jacqueline N. Crawley
Wim E. Crusio
Abraham A. Palmer
Catharine H. Rankin
Hee-sup Shin
Douglas Wahlsten
Robert W. Williams

Please note that society members are able to submit nominations. Nominees for Fellow will be considered by a sub-committee of the Awards Committee consisting of Fellow Appointees.

Trainee Symposium

Another first! The first IBANGS Trainee Symposium was awesome. Thank you to the organizers, Danila Cuomo, Antonia Savarese, and Kristin Scaplen for planning this event and to the panel members for contributing their expertise.

Congratulations to the winners of the best trainee research talk and data blitz presentations, Lucy Hall and Elam Cutts.



Best Trainee Research Talk

Lucy Hall, Graduate student
University of Colorado Boulder
Department of Integrative Physiology
<https://www.colorado.edu/iphy/people/faculty/marissa-ehringer>

Differential gene expression responses to oxycodone self-administration in the amygdala and prefrontal cortex of inbred rat

strains Lucy Hall^{2,4}, Kyle T. Brown^{1,2}, Daniel Foster³, Winona Booher^{2,4}, Laura Saba³, Ryan K. Bachtell^{1,2}, Marissa A. Ehringer^{2,4},

To identify the genes and pathways involved in opioid use disorder, we utilized a longitudinal behavioral paradigm in male and female SHR/Ola and ACI inbred rat strains prior to performing RNA sequencing. Several phenotypes were measured including tests of analgesia, oxycodone intake, tolerance, and withdrawal. SHR/Ola rats were resistant to oxycodone-induced analgesia and showed minimal tolerance after chronic oxycodone self-administration. In contrast, ACI rats displayed an initial robust analgesic response that diminished after chronic oxycodone self-administration. Acquisition of oxycodone self-administration and escalation of oxycodone intake was similar across strains. The motivation to self-administer oxycodone was measured in a progressive ratio test conducted before and after escalated oxycodone intake. SHR/Ola rats showed minimal escalation in the motivation to self-administer oxycodone compared with ACI rats. Transcriptome expression differences were analyzed using RNA sequencing of amygdala and prefrontal cortex tissue collected from both strains following oxycodone self-administration. In the amygdala, 147 genes had a significant oxycodone effect and for 81 of these 147, the oxycodone effects differed significantly between strains. In the prefrontal cortex, 518 genes exhibited an oxycodone effect and in 53 of these genes, the effect of oxycodone differed between strains. Comparison of tissues revealed nine genes that had a significant oxycodone effect in both the prefrontal cortex and amygdala. Pathway-based analyses suggest genes involved in inflammatory response, neural development, and synaptic plasticity show oxycodone-related differences. These data demonstrate that genetics can influence both molecular responses to oxycodone exposure and behavioral responses in this oxycodone consumption paradigm.

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Funding Support: NIDA U01 DA051937 and NIDA P30 DA044223.




Best Trainee Data Blitz

Elam Cutts, Graduate Student
University of Alabama at Birmingham
Department of Psychiatry and Behavioral Neurobiology
<https://hardawaylab.org/lab-members/>

Assessment of circadian rhythms of striatal dopamine signaling via optical imaging

Elam Cutts¹, Ningxiang Zeng¹, Karen Gamble¹, Andrew Hardaway¹.



The dopaminergic system has been extensively studied for its influence on brain circuit function and behavior. In addition to this, the rhythmic expression of molecular core clock genes such as PER1, PER2, and BMAL1 in the suprachiasmatic nucleus has been thoroughly characterized. While rhythmicity has been shown in behaviors such as feeding and exercise, it remains to be determined if dopamine (DA) signaling itself is rhythmic, and if rhythmicity exists in primary outputs of dopamine neurons, such as the dorsal striatum. Selective loss of function and/or degeneration of DAergic neurons is a hallmark feature of Parkinson's disease (PD), and transgenic PD mouse models have shown circadian abnormalities associated with dysfunction of the primary circadian pacemaker in the suprachiasmatic nucleus. Thus, examination of the molecular clock's role in striatal DAergic expression has the potential to give insight to the underlying mechanisms of the disease. Utilizing the DA indicator dLight1.2 and fiber photometry, we measured DA transients in the dorsal striatum in freely behaving mice for periods of 24 hours under a 12:12 LD cycle and a 12:12 DD cycle. To ensure the DAergic identity of optical signals, we performed systemic injections of the DA transporter effluxer amphetamine (AMPH), and the D1 antagonist SCH23390 simultaneously with open-field assessments. DA signals significantly increased and decreased following AMPH and SCH23390 injection, respectively. Future studies will include the use of these same techniques in full body or nigrostriatal specific BMAL knockout animals to determine if circadian rhythms of striatal DA require core molecular clock genes.

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Funding Support: K01DK115902 to AH

Machine Learning for behavior analysis workshop

Sam Golden, Vivek Kumar and their lab members organized an outstanding workshop. If you were unable to attend but are interested in learning about their methods and exploring the packages for behavior classification, resources related to the workshop are available online: <https://thejacksonlaboratory.github.io/2021-05-11-ml-for-behavior-analysis/>

Kumar Lab

JABS (Jax Animal Behavior System)

<https://github.com/KumarLabJax/JABS-behavior-classifier>

Golden Lab

Simba (Simple Behavioral Analysis)

<https://github.com/sgoldenlab/simba>

Journal News



In January of 2022, *Genes, Brain and Behavior* will transition to open access. Wiley will begin advertising the transition soon. Updates will be provided as the information is received. For questions, please contact Publications Committee Chair, Marissa Ehringer [Marissa.Ehringer@colorado.edu].

Genes, Brain and Behavior 2022



Given the easing of COVID pandemic, the 2022 annual meeting is anticipated to take place in person. Megan Mulligan and team at The University of Tennessee Health Science Center will be hosting the meeting. Updates will be sent as the information is received. It's never too early to consider submitting a symposium proposal. For more information contact Megan Mulligan [mulliganmk@gmail.com]

Member News



New Appointment

Alex Keene will be starting a new position as Chair of the Biology Dept at Texas A&M University

<https://www.bio.tamu.edu/>

Congratulations Alex!

We all wish you much success and look forward to hearing about your future work.



Recent Publications

Amy Lasek and team have recently published 2 papers. Bravo!

Hamada, K., Ferguson, L.B., Mayfield, R.D., Krishnan, H.R., Maienschein-Cline, M., & Lasek, A.W. (2021) Binge-like ethanol drinking

activates ALK signaling and increases the expression of STAT3 target genes in the mouse hippocampus and prefrontal cortex. *Genes Brain Behav.* Feb 28;e12729. doi: 10.1111/gbb.12729. Online ahead of print.

Chen, W.-Y., Chen, H., Hamada, K., Gatta, E., Chen, Y., Zhang, H., Drnevich, J., Krishnan, H.R., Maienschein-Cline, M., Grayson, D.R., Pandey, S.C., and Lasek, A.W. (2021) Transcriptomics identifies STAT3 as a key regulator of hippocampal gene expression and anhedonia during withdrawal from chronic alcohol exposure. *Translational Psychiatry* 11:298.

Career Opportunities OHSU

Oregon Health & Science University (OHSU) has a new post-baccalaureate research program called PREP and the application window for this program is currently open (with a priority deadline of July 1st). Details about the program can be found in the links below.

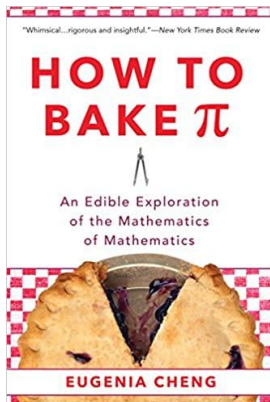
OHSU Prep website: <https://www.ohsu.edu/postbaccalaureate-research-education-program>

The current list of faculty participating in this program is noted on the faculty section of the website (<https://www.ohsu.edu/postbaccalaureate-research-education-program/participating-faculty>).

The Portland Alcohol Research Center (PARC) is looking for a postdoctoral fellow interested in investigating the role of the tetra-partite synapse in the development of excessive alcohol drinking utilizing behavioral, molecular genetic and/or informatics approaches. Laboratories which are collaborating in this effort include those of Drs. Angela Ozburn, Tamara Phillips, Rita Cervera-Juanes, Virginia Cuzon-Carlson, and Kathy Grant. Details about the position can be found here

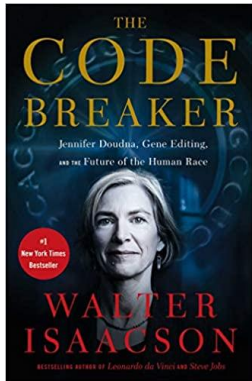
<https://postdoctoral-ohsu.icims.com/jobs/9608/postdoctoral-scholar/job?mode=view&mobile=false&width=758&height=500&bga=true&needsRedirect=false&jan1offset=-480&jun1offset=-420>

Summer reads



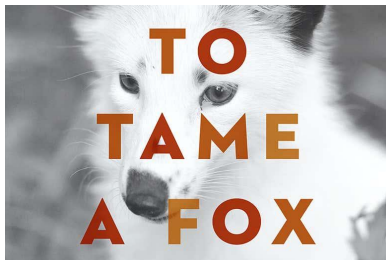
[How to Bake Pi: An Edible Exploration in Mathematics](#)

Recipe for desserts to illustrate the methods and principles of mathematics and how they relate to one another. The book is an explanation of the foundations and architecture of [Category theory](#).



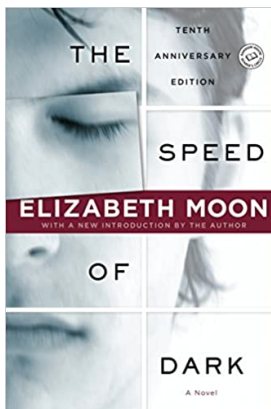
[The Code Breaker: Jennifer Doudna, Gene Editing, and the Future of the Human Race](#)

Biography of Jennifer Doudna, the winner of the 2020 Nobel Prize in Chemistry for her work on the CRISPR system of gene editing.



[How to Tame a Fox \(and Build a Dog\): Visionary Scientists and a Siberian Tale of Jump-Started Evolution](#)

Story of a breeding experiment aimed to domesticate foxes



[The Speed of Dark](#)

Novel written from the perspective of a high functioning autistic person



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