The Synapse: Intercollegiate science magazine

Volume 8 | Issue 1 Article 18

2016

Honors Research: Featured Research by Oberlin College Students

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Honors Research

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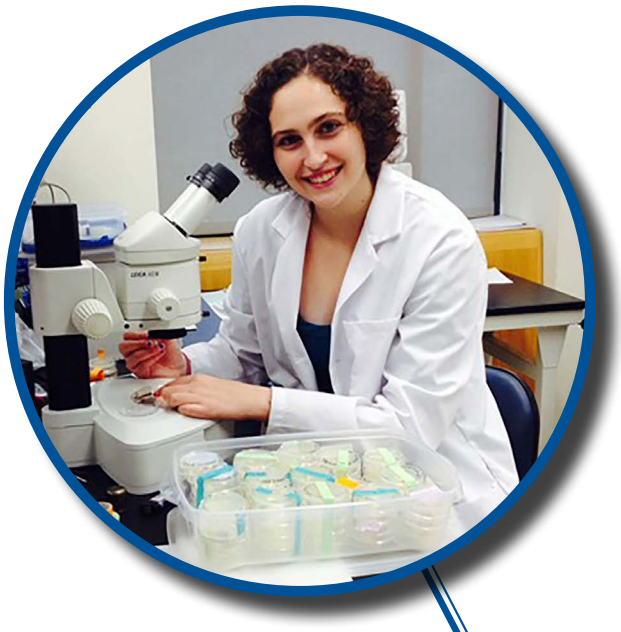
Investigating the Function of Intestinal Cell-Cell Communication in C. Elegans Peptide Secretion

Lisa Learman



Groups of organisms exhibit social behavior that is thought to improve survival and reproduction. Different forms of social interaction are present in all sorts of organisms, from bacteria forming microfilms to flocks of birds navigating a migration. However, the molecular mechanisms responsible for these behaviors remain poorly understood. We are investigating the role of an intestinal gap junction in a C. ***elegans*** behavior known as social feeding, in which worms cluster together while foraging. In wild isolates this behavior is due to a single nucleotide polymorphism in neuropeptide receptor NPR-1. NPR-1 is a G protein-coupled receptor that suppresses social feeding when active. NPR-1 can be activated by FLP-21, a peptide expressed in many neurons and the posterior intestine. The intestine can act as a neurosecretory organ in C. ***elegans*** and many peptides are found there. We identified a social feeding defect in strains with mutated intestinal gap junction IN¬X-16 and have conducted research showing that INX-16 and NPR-1 act in a common pathway to mediate social feeding. We hypothesize that in ***inx***-16 mutants defective FLP-21 secretion from the intestine leads to insufficient activation of the NPR-1 receptor to promote social feeding. Current and future research will attempt 1) to show that FLP-21 and INX-16 act in the same pathway to mediate social foraging 2) to determine where FLP-21 functions to suppress aggregation and 3) whether FLP-21 is properly synthesized, packaged, released, and received in ***inx***-16 mutants.

Implicit and Explicit Attitudes Towards Transgender People: The Role of Social Desirability and Tolerance for Ambiguity

Stephanie Atwood

Although transgender visibility is on the rise, ample research suggests that people still harbor negative attitudes towards transgender individuals. My honors research in social cognition explores the issue of transgender stigma by examining the magnitude of association between people's implicit and explicit attitudes towards images of transgender people with a particular focus on the demographic and psychosocial variables that predict unfavorable reactions at the implicit and explicit levels. This study utilized a picture version of the Implicit Association Test (P-IAT) to measure implicit attitudes and a battery of self-report scales to measure explicit attitudes towards transgender individuals as well as other demographic and psychosocial variables. Analysis revealed that some psychosocial variables such as participants' level of psychological authoritarianism, endorsement of binary gender, and prior contact with gender and sexual minorities universally predicted attitudes towards transgender individuals. Other measures such as the nature of the relationship between implicit and explicit attitudes were found to significantly differ by gender. This research has the potential to enhance our limited understanding of potential motivations behind prejudice and discrimination targeted against transgender individuals and sheds light on the broader stigma against gender-nonconformity.

Carbon Stable Isotope Analysis of Mudstones at Slope Mountain, Alaska

Ashely Ratigan

This project uses carbon stable isotopes (δ13C) of mudstones and coal fragments to determine past environmental conditions of North Slope, Alaska during the Albian-Cenomanian (Cretaceous). Samples were taken at Slope Mountain, Alaska located north of the Brooks Range, along Mile 305 of the Dalton Highway. Slope Mountain, also known as Marmot Syncline, includes the Upper Nanushuk and Lower Nanushuk Formations that consists of alluvial, deltaic, and shallow marine facies that were deposited during the Albian to Cenomanian. δ13C analysis can help determine different information about the past environment and the different types of organic matter contributing to the system. If possible, identifiable microfossils, such as pollen, diatoms, and foraminifera will be separated from the organic material for analysis that would provide additional information about the climate and vegetation.