Investigating the Role of SMPD4 in Anterograde Sorting of Pseudorabies Virus in Neurons

Figure: Pseudorabies virus (PRV) infectious cycle
Natalia Brokate

Functional and Structural Validation of a Novel Nuclear Localization Sequence within the Microtubule Effector TPX2
Leslie Chan

Identifying the Role of DNA ligase I in Hepatitis B Virus cccDNA Formation in Human Hepatoma Cells
Tiffany Chen
Investigating the Learning Potential of Tsc1 Mice through an Evidence-Accumulation Task
The repx-2 Gene Regulates Reproductive Aging in *Caenorhabditis elegans*
Joshua Choi

Investigating the Origin of Substrate Specificity in the Circadian NADP(H) Phosphatase Nocturnin
Céleste Claudio

Probing the Dynamics of Usutu Virus Infection, Replication, and Spread Using an *in vitro* Cell Culture Model
Developing Tools to Identify Novel Protein Components of Drosophila Germ Granules Using BioID
Taking Diabetes to Heart: An Assessment of the Early Emergence of Cardiovascular Disease and Known Risk Factors in Youth with Type 1 Diabetes

Figure 4.1 | Demographic and Clinical Characteristics at Onset Independently Predict the Development of Known CVD Risk Factors in T1DM Youth. Upon diagnosis, youth aged <15 years present with a number of demographic and clinical characteristics at onset. Based upon the results from the study in Chapter 3, these characteristics at onset can independently predict the presence of different known risk factors that can increase the risk for cardiovascular disease morbidity and mortality later in life.
Sofia Dimitriadioy

Elucidating the Role of YTHDF1 in Mammary Gland Development and Breast Tumorigenesis
Kendra Dombroski

Nurturing the Food-Mood Connection: Disentangling the Nutritional and Tactile Effects of Nursing in the Long-Term Stress Response
Wen Du

Quorum Sensing and Type VI Secretion Dependent Genotypic Diversification in Aging *V. cholerae* Colonies

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+ *ptfoX-qstR*
Examining the Role of Integrin-Linked Kinase in High Glucose-Induced Fibronectin Matrix Assembly
Ty Gardner

A Biosensor-Mediated Nanobody Screen for Changes in Isopentanol Flux in S. cerevisiae
Sophia Gavrilenko

High-Throughput Localization of Proteins with Predicted Photosynthetic Function in the Green Alga *Chlamydomonas reinhardtii*
The Effects of Cytokine Signaling and Memory Differentiation on Mammalian T-helper Cell Effector Phenotype Plasticity
Investigating the Localization and Self-organization of Core Planar Cell Polarity Proteins using an Endogenously Tagged Fz6 Fusion Protein

Figure 12: Fz6-3xGFP cells mixed with wild-type littermates on ALJs occasionally, but not consistently, demonstrates unipolar localization of Fz6-3xGFP. Fz6 staining marks both Fz6-3xGFP positive cells and wild-type cells. Ecad staining marks all junctions. Cells which appear to show unipolar localization of Fz6-3xGFP are marked with white arrows. Inset shows magnified example. A cell with apparent bipolar localization of Fz6-3xGFP is marked with a blue arrow. Scale bar = 50μm.
HIF-1α as a Therapeutic Target to Combat Oxidative Stress in Parkinson’s Disease
A “DEEP” Alternative to Heterologous Protein Expression

Figure 1. An illustrative example of a de novo protein sequence and structure from the Hecht lab, S-824. (a) Sequence of S-824 with the hydrophobic (yellow) and polar (red) residues of the four helices shown. Loop regions connecting the helices are blue. Histidine residues important for NvIV-NAC purification are colored in dark red or dark blue. (b) Structure of S-824 in solution via NMR spectroscopy with histidine side chains in stick model. (c) A top-down view of the structure of S-824, showing the hydrophobic core buried by polar residues. (d) Same view as in (c), but S-824 is displayed as helical wheel projection. PDB: 1P88

Alex Jiang
Sarah Jun

Structure-function Analysis of How XMAP215 Binds γ-Tubulin for Microtubule Nucleation
Enhancing Signaling Flux via Light-Induced Assembly of the Mitogen-Activated Protein Kinase (MAPK) Pathway
Keunho Kim
Investigating the Relationship between Cell Fate and Collective Cell Migration in Hair Follicle Morphogenesis
Yunah Kim

A Functional Analysis of Calcium Channels painless and dTRPA1 in Germ Cell Migration in *Drosophila Melanogaster*
Bojan Lazarevic

Investigating the Role of the hnRNP Glorund in the *Drosophila* Central Nervous System
Investigating the Role of Chronic Stress in the Regulation of Telomere Length in Mice

Figure 3.7: An experimental mouse in the CORT/VEH group during corticosterone/vehicle injection. The red circle indicates subcutaneous injection in the left side.
DaeHee Lee

Reflection of Hippocampal Cell Ensemble Activation Patterns in Model-Based Behavior in Rodents
Analysis of the SM-SNARE Interactions in Golgi-to-ER Retrograde Vesicular Transport
Investigating the Phenotypic Effect of the A158G Mutation in the RRAS2 Gene on Embryonic Growth and Development
Nikita Nangia

Fighting the Antibiotic Resistance Crisis: An Exploration into the Role of the Pneumococcal Vaccine and its Non-Specific Effects in Ameliorating Antibiotic Resistance
Agatha Okobi

Transcriptional Dynamics of \textit{scylla} and \textit{charybde} in the \textit{Drosophila melanogaster} embryo
Ebun Olunuga

Investigating the role of YciM as an Adaptor Protein Regulating Lipopolysaccharide Synthesis in *Escherichia coli*
Cam On

Cryo-EM Structural Determination of Nav1.7-NaChBac Chimera and DF1A Toxin
Megan Ostrowski

Development of High-Throughput Tools for the Investigation of Quorum Sensing in *Vibrio cholerae*
Nicholas Persaud

Rethinking Nicotine Use: An Evaluation of the Efficacy of Nicotine Containing Smoking Cessation Products and the Potential of Nicotine to Treat Diseases
Dani Peters

We Work Hard but Our Bacteria Work Harder: An Investigation into Fludarabine Metabolism by the Gut Microbiome
Crus Control: Left-right Specific Lateralization of Nonmotor Cognitive Tasks in Cerebellar crus I in Mice
Pranav Rekapalli

Characterizing the Role of Lamin B1 Acetylation in Regulating the Integrity of the Nuclear Periphery
Michelle Rowicki

Metadherin Promotes Triple-Negative Breast Cancer Progression and Metastasis by Inducing Immune Evasion
Ashley Salimbangon

Investigating the Regulation of the Innate Immune Responses of PRV-Becker and PRV-Bartha Infections in Neurons In Vitro
Daniel Samé Guerra

The Essential Protein YejM Functions through YciM/FtsH to Control Lipopolysaccharide Biosynthesis in *Escherichia coli*
Sandra Sequera

Investigating the Mechanisms of Surface-induced Virulence in *Pseudomonas aeruginosa*

*Figure 3.* Mass spectrometry (MS) analysis of protein abundance in surface-attached and planktonic *P. aeruginosa*. (A) Bar graph of the ratio of protein abundance of the *PsaABCDE* enzymes in surface-attached (SA) and planktonic (P) samples analyzed using MS-based proteomics. (B) Bar graph of the 5 most induced transcription factors from the MS analysis. The error bars represent the difference between the 95% confidence value and the SA to P ratio.
Rohan Shah
Interrogating RNA Modifications Through Proximity Labeling and Platinum Molecular Probes
Meta-Analysis of Copy Number Variants Associated with Attention Deficit Hyperactivity Disorder
Jared Shulkin

Exploring DNA Methylation as a Mediator Between Exposure to Airborne Neurotoxicants and Cognitive Impairment in Children

Figure 7. Manhattan plots from EWASs locating specific CpG sites with Age 9 differential DNA methylation on the EPIC array associated with exposure to airborne neurotoxicants at baseline (top) and at Year 9 (bottom).
Will Steidl

CRISPR-Mediated Mutation of \textit{ppplcb} Leads to the Development of RASopathy-Like Phenotypes in Zebrafish
Mayisha Sultana

A Quantitative Summary Statistic for Genetic Admixture

Error comparison

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Investigating the Regulation of the DNA Sensor cGAS Following Viral Infection

Major findings from Aim 1: Site-specific PTM regulation of cGAS functions

- Innate Immune Activation
  - K198Q
  - K50, K292, K432
- Apoptosis
  - K198Q, K50, K292, K432
- Protein-Protein Interactions
  - K198Q – BANF1
  - K198Q – ZC3HAV1

* Relative to K384Q levels in HSV-1 infected HPF2

[Diagram showing identified phosphorylation and modification sites]
Kalina Tsolova

Investigating the conformation of the QaSNARE Vam3 and its interactions with the HOPS subcomplex Vps33:Vps16
An Investigation of Teratogenic Viruses: Analyzing the Implications of Congenital Infections on Viral Transmission Dynamics
Giselle Uribe
Development of Optogenetic Tools to Investigate the Mechanism of Cytoplasmic Receptor Tyrosine Kinase Signaling
Alice Vinogradsky

Investigating the Role of LncRNA-75 in TGF-β Signaling and Breast Cancer Progression
“Language Gene” FoxP Modulates Pulse Song Features and Spatial Localization
Alexandra Wilson

Establishing a Computational Model of the CO2-Concentrating Mechanism in *Chlamydomonas reinhardtii*
Genome-Wide CRISPR/Cas9 Screens in a 3D Tumor Spheroid Model Identify Tumor Suppressor Genes in Breast Cancer
Mapping the Origins of the Vertebrate Brain

Peter Hyungjun Yoon
Uncovering the Molecular Mechanisms of Stripe Pattern Formation in Thirteen-Lined Ground Squirrels
HONORS
Honors

Sophia Gavrilenko
Alison Heilbronner
Michael Hill-Oliva
Bojan Lazarevic
Annabel Lee
Daniel Samé Guerra
Jong Hyeon Kevin Shin
Mayisha Sultana
Caroline Taber
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Development of Optogenetic Tools to Investigate the Mechanism of Cytoplasmic Receptor Tyrosine Kinase Signaling
CONGRATULATIONS!

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