



National Science Foundation



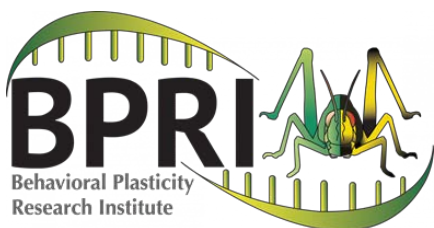
# PROPOSAL CALL FOR BPRI LAB SWAP I & II

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**Interdisciplinary Exposure & Training for Graduate  
and Postdoctoral Trainees**

## Behavioral Plasticity Research Institute

*“Working to transform the way phenotypic plasticity is studied”*



## Table of Contents

<b>BPRI Lab Swap-Interdisciplinary Training for Graduate Students and Postdocs.....</b>	<b>2</b>
Overview and Program Objectives.....	2
Ten BPRI Research Themes .....	2
<b>Lab Swap I.....</b>	<b>3</b>
Steps for Applying for Lab Swap I.....	3
Proposal Process for Lab Swap I.....	3
Proposal Format for Lab Swap I .....	4
Section 1: Summary .....	4
Section 2: Project Description .....	5
Section 3: Timeline.....	5
Section 4: Budget.....	5
Responsibilities of Trainees .....	5
<b>Lab Swap II: Cohort Visits .....</b>	<b>6</b>
Steps for Applying for Lab Swap II.....	6
Proposal Process for Lab Swap II.....	6
Proposal Format for Lab Swap II .....	7
Section 1: Summary .....	7
Section 2: Lab Swap Program Participation .....	7
Section 3: Timeline.....	8
Section 4: Budget.....	8
Responsibilities of the Trainees .....	8
<b>List of Interdisciplinary Experts &amp; Research Areas .....</b>	<b>9</b>
<b>List of Contact.....</b>	<b>11</b>

# BPRI Lab Swap-Interdisciplinary Training for Graduate Students and Postdocs

## Overview and Program Objectives

The Behavioral Plasticity Research Institute (BPRI) Lab Swap Research Program aims to facilitate interdisciplinary research exposure and expertise among BPRI graduate and postdoc trainees across partner institutions. Funding is available for all trainees and there are two options:

1. Lab Swap I allows trainees a 1-2 month-long engagement in integrated interdisciplinary research at any BPRI host lab, or a lab that facilitates research and collaboration with regard to the 10 key BPRI research themes.
2. Lab Swap II allows trainees a 1-week long immersive exposure to an affiliated BPRI lab.

Trainees are encouraged to do their Lab Swap with any BPRI-affiliated lab conducting research projects that align with the following program objectives:

1. Learning new methods and core concepts to advance future career and research interests.
2. Participating in collaborative research activities within the BPRI network.
3. Engaging in integrative projects in collaboration with BPRI institutional PIs and trainees.
4. Providing opportunities for cultural exploration and networking, with organized outings and social functions to complement the academic components.

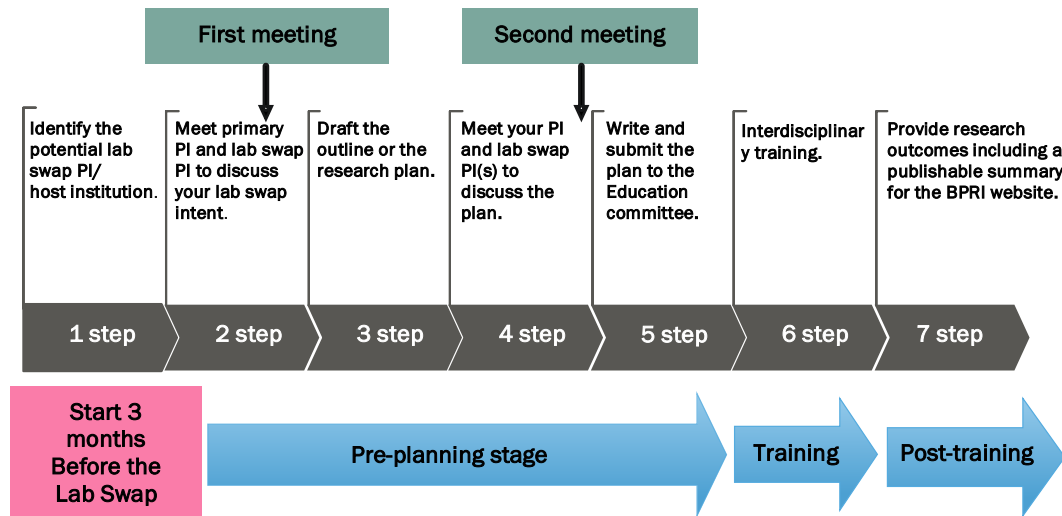
**Note.** *While participation is voluntary, all graduate (master's and PhD) and postdoc trainees are encouraged to take advantage of this enriching opportunity to expand their research and project management skills within a supportive and collaborative environment.*

## Ten BPRI Research Themes

- R1. Whole-genome sequencing and assembly
- R2. Tissue-specific transcriptomics over the time-course of gregarization and solitarization.
- R3. Time-resolved / tissue-specific epigenomic profiling during gregarization and solitarization.
- R4. Development of genome editing tools to mechanistically probe phase change.
- R5. Single-cell characterization of state-specific visual processing for collision avoidance.
- R6. The neuronal basis of density-dependent changes in olfactory behavior and olfactory processing.
- R7. Genetic basis of individual behavioral plasticity and group-level collective mass movement.
- R8. Characterization of density-dependent nutritional physiology and metabolism transcriptomes.
- R9. Integrating lab to field research.
- R10. Phylogenetic comparison of density-dependent phenotypic plasticity.

# Lab Swap I

## Steps for Applying for Lab Swap I



## Proposal Process for Lab Swap I

### Project Overview

Lab Swap I enables research integration by offering a 1-2 month-long immersion in interdisciplinary research at a different BPRI host lab. This Lab Swap requires a long-term commitment to planning, spanning at least one year, which includes pre-planning, engaging in interdisciplinary research, and completing reports. Ideally, the expected output of the proposed research activity is the generation and submission of a manuscript for publication. A timeline with activities and expected completion dates should be included in the proposal.

### Project Budget

The maximum request per trainee is \$5000. A budget description must be completed following the guidelines stated in this document (see below). Because this program is initiated with support from NSF award 2021795, [unallowable cost items](#) under NSF regulations are not permitted. Trainees are also encouraged to seek external funds (e.g., travel support or departmental research funds) to supplement BPRI funds.

### Eligibility

Proposals will only be considered for the following trainees:

- Graduate students who identify as a BPRI trainee as described in the BPRI Memorandum of Understanding (MOU).
- If the project has interdisciplinary training activities that require spending substantial time outside of the primary institution, BPRI trainees must ensure that their interdisciplinary training activities do not interrupt the requirements associated with their degree plans.

- Trainees are encouraged to apply for the lab swap in groups to facilitate multiple participation.

## **Proposal Review Process**

The proposal will be first reviewed by the trainee's PI and Lab Swap PI then submitted to the Education committee for further review and approval. Trainees will expect reviews two weeks after submission. Trainees will then have two weeks to modify and resubmit the proposal to their PI and Lab Swap PI.

## **Proposal Review Criteria**

The proposal will be evaluated following five principles.

1. Clear explanation of uniqueness and innovativeness of proposed activity with details of how the project will advance the ten BPRI research themes.
2. Plan for research collaboration and integrations.
3. Effective use of funds to optimize the outcomes.
4. Contribution to the trainee's career development.

## **Deadline**

Applications for the BPRI lab swap grants are open throughout the year. However, graduate trainees should apply at least three (3) months before the planned training activity. The complete application should be submitted to the BPRI education coordinator, Dr. Millicent Oyugi ([millicent.oyugi@ag.tamu.edu](mailto:millicent.oyugi@ag.tamu.edu)).

## **Proposal Format for Lab Swap I**

### **Section 1: Summary**

**Trainee:**

**Trainee Institution:**

**Primary Mentor(s):**

**Lab Swap Mentor (s):**

**Lab Swap Mentor's Institution:**

**Collaborator(s) and their Institution (if any):**

**Main BPRI research themes (R1 to R10):**

**Short Title:**

**Lay Summary (100 words):**

**Duration of Project:**

**Total Amount Requested:**

## **Section 2: Project Description**

BPRI trainees are required to communicate with their PI and Lab Swap PI to discuss and outline objectives of their research idea. The proposed project should be focused on the research objectives of the BPRI. The project description should include the following information.

- i. **Objectives:** List the main objective (100 characters or less).
- ii. **Plan for research collaboration and/or integrations:** Provide a brief synopsis (250 words) about how the trainee and PIs will collaborate to achieve integration.
- iii. **Expected outcomes:** The proposal should clearly outline 3-5 expected outcomes (each 100 characters or less). Outcomes can be a research article, a section or chapter in your thesis or dissertation, a poster, or a conference paper or poster. Each proposed outcome should advance the BPRI's scientific objectives and support its mission.

## **Section 3: Timeline**

The timeline will list important research steps, including pre-training, the nature of the exchange, and post-training activities, including their timing.

- Pre-training activities will include two online meetings with primary PI and Lab Swap PI, and proposal reviews.
- Post-training activities will include producing research products (e.g., manuscripts or a conference presentation) and a short summary (150-200 words) for the BPRI website.

The timeline should also show how your research will progress over time, including any planned collaborative activities.

## **Section 4: Budget**

The budget for the proposed project should include the cost of participating in the interdisciplinary training or exchange visit and include travel, accommodations, and meal expenses. Use the U.S. general service administration rate (<https://www.gsa.gov/travel-resources>) to estimate accommodation and meal expenses. The budget should include cost items, amount, and short justifications as needed. Refer to NSF budget guidelines to identify allowable expenses. There is no specific template for the budget, but it should not exceed one single-sided page. For group projects, funds should be allocated fairly such that each trainee gets the opportunity to participate in interdisciplinary training.

## **Responsibilities of Trainees**

- Develop the Lab Swap proposal.
- Maintain communication with their PI and the Lab Swap PIs throughout the project's duration.
- After receiving approval, communicate with the Lab Swap PI about accommodations and access to the laboratory. It will also be necessary to complete some documents before travelling.

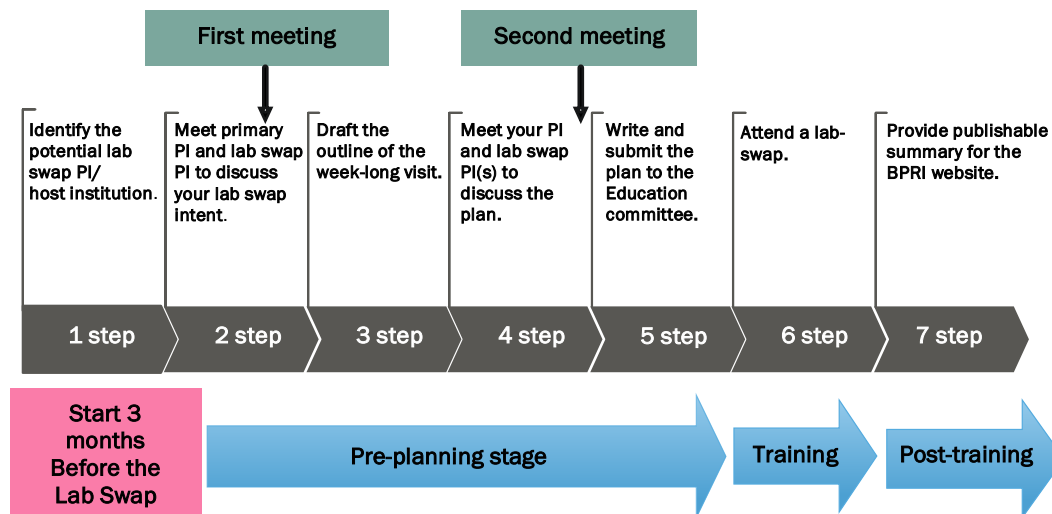
*NOTE: The administrative procedures to get access to specific labs may take up to 1-2 months depending on a given institutions protocols.*



- Follow lab safety procedures, institutional rules, and regulations applicable to the host institution.
- Complete pre-and post-program evaluation questionnaires. The pre-program evaluation should be completed one week after submission of the proposal. The post evaluation should be completed no later than one week after submitting a final report.
- Attend meetings or events as required by the host institution.
- Submit the project deliverable within the timeline proposed.

## Lab Swap II: Cohort Visits

### Steps for Applying for Lab Swap II



### Proposal Process for Lab Swap II

#### Project Overview

The Lab Swap II program provides trainees an opportunity to experience ongoing interdisciplinary research methodologies in a different BPRI lab. Participants will engage in a week-long Lab Swap, and gains exposure to the host’s lab and research environment. Activities during the Lab Swap II run from Monday to Friday, with Saturdays reserved for exploring the local area. Sunday is designated for departure from the host institution.

#### Project Budget

The maximum request per trainee is \$2000. A budget description must be completed following the guidelines stated in this document (see below). Because this program is initiated with support from NSF award 2021795, [unallowable cost items](#) under NSF regulations are not permitted. Trainees are encouraged to seek external funds, such as travel support or departmental research funds, to supplement BPRI funds.

## **Eligibility**

Lab Swap II proposals will be considered for eligible trainees as outlined by program guidelines.

- Each participant must identify as a BPRI trainee, as defined in the BPRI Memorandum of Understanding (MOU).
- It is essential that the proposed lab exchange, outside of the trainee's primary institution, does not interfere with or contradict the requirements specified in their academic degree plans.
- Trainees may receive Lab Swap II funds once. They can still participate in other proposed Lab Swaps as collaborators, even after receiving funding for a Lab Swap II project.

## **Deadline**

Applications for BPRI Lab Swap grants are open throughout the year. However, graduate trainees should apply at least three months before their planned training activity. The finalized application packet should be submitted to the BPRI education coordinator, Dr. Millicent Oyugi (millicent.oyugi@ag.tamu.edu).

## **Proposal Format for Lab Swap II**

### **Section 1: Summary**

**Trainee:**

**Trainee Institution:**

**Primary PI (s):**

**Lab Swap PI (s):**

**Lab Swap PI's Institution:**

**Dates of Lab Swap:**

**Total Amount Requested:**

### **Section 2: Lab Swap Program Participation**

To express interest in the Lab Swap II program, BPRI trainees are encouraged to initiate a dialogue with their PI and Lab Swap PI to discuss their Lab Swap II plans. The trainee's participation should aim at gaining exposure to or enhancing any of the ten BPRI research areas.

The participation description should encompass the following:

1. Summary of Lab Swap II intent
2. Description of detailed itinerary outlining the week-long activities
3. Lab Swap II timeline
4. Budget allocation
5. Expected outcomes



### **Section 3: Timeline**

The timeline should include essential lab swap action points detailing pre-training, lab swap activities, and post-training activities and their respective timings.

- Pre-Lab Swap activities should consist of two online meetings with the primary PI and Lab Swap PI and reviews of Lab Swap proposals.
- Post-Lab Swap activities should involve drafting a publishable summary (150-200 words) for the BPRI website and completing pre-post assessment surveys.

### **Section 4: Budget**

The budget for the proposed project should include the cost of participating in the interdisciplinary lab swap including travel, accommodation, and meal expenses. Use the U.S. general service administration rate (<https://www.gsa.gov/travel-resources>) to estimate accommodation and meal expenses. The budget should include cost items, amount, and short justifications as needed. Refer to NSF budget guidelines to identify allowable expenses. There is no specific template for the budget, but it should not exceed one single-sided page.

### **Responsibilities of the Trainees**

- Develop the Lab Swap II proposal.
- Maintain communication with their PI and Lab Swap PI throughout the project duration.
- Ensure completion of necessary documentation prior to travel (NOTE: administrative procedures for lab access may take 1-2 months based on an institution's protocols).
- Upon approval, coordinate with the Lab Swap PI regarding laboratory access.
- Adhere to lab safety protocols, institutional guidelines, and regulations of the host institutions.
- Attend meetings or events as required by the host institution.
- Deliver project outcomes within the proposed timeline.
- Participate in pre- and post-program evaluation by completing questionnaires.

## List of Interdisciplinary Experts & Research Areas

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Dr. Anna Childers



Dr. Erez Lieberman  
Aiden

### **Research Area: Genomics**

#### ***Research Goal in BPRI:***

Identify *Schistocerca* genes associated with swarming.



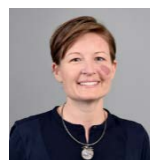
Dr. Olga Dudchenko



Dr. Stephen Richards



Dr. Spencer Behmer



Dr. Arianne Cease

### **Research Area: Nutrition, Microbiomes, Ecology**

#### ***Research Goal in BPRI:***

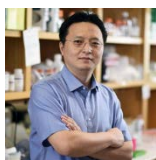
Characterize the following in lab-reared solitary and gregarious phases of *Schistocerca*: nutritional demands and regulation strategies, gut microbiota, migration capacity, fuel use, and thermal performance curves. Compare environments of gregarization zones vs non-outbreak regions using remotely sensed NDVI and climate data. Compare individuals collected from low- and high-density locust populations with lab-reared solitary and gregarious phase individuals.



Dr. Rick Overson



Dr. Brittany Peterson



Dr. Chuck Zong



Dr. Hojun Song

### **Research Area: Transcriptomics**

#### ***Research Goal in BPRI:***

Understand gene regulation and the epigenetics of phase change; generate a transcriptomic atlas of *Schistocerca*.



Dr. Herman Dierick

### **Research Area: Genome Editing**

#### ***Research Goal in BPRI:***

Transfer an efficient, background independent CRISPR/Cas9 system developed in *Drosophila* to grasshoppers.



Dr. Hojun Song

**Research Area: Evolution**

***Research Goal in BPRI:***

A pan-genome linking transcriptomics and epigenomics to explain phenotypic plasticity.



Dr. Greg Sword

**Research Area: Collective Behavior**

***Research Goal in BPRI:***

Comparative analyses of individual behavioral phase change and collective movement for six *Schistocerca* species that vary in expression of plasticity.



Dr. Fabrizio Gabbiani

**Research Area: Vision**

***Research Goal in BPRI:***

Characterize escape behavior in solitary and gregarious phases; characterize changes in the firing properties of collision-detecting neurons and associated changes in gene expression.



Dr. Barani Raman

**Research Area: Olfaction**

***Research Goal in BPRI:***

Examine phenotypic state-dependent olfactory processing; achieve a time-resolved understanding of olfactory response change during phase change; identify genes involved, transcriptomic and epigenetic changes in the first two olfactory neuropils.

## List of Contact

### General information on the program

Dr. Millicent Oyugi: [millicent.oyugi@ag.tamu.edu](mailto:millicent.oyugi@ag.tamu.edu)

### Institutional specific information

#### *Arizona State University*

Dr. Arianne Cease: [acease@asu.edu](mailto:acease@asu.edu)

#### *Baylor College of Medicine*

Dr. Fabrizio Gabbiani: [gabbiani@bcm.edu](mailto:gabbiani@bcm.edu)

#### *Southern Illinois University Edwardsville*

Dr. Brittany Peterson: [bripete@siue.edu](mailto:bripete@siue.edu)

#### *Texas A&M University*

Dr. Hojun Song: [Hojun.Song@ag.tamu.edu](mailto:Hojun.Song@ag.tamu.edu)

#### *Washington University in St. Louis*

Dr. Barani Raman: [barani@wustl.edu](mailto:barani@wustl.edu)



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