



National Science Foundation



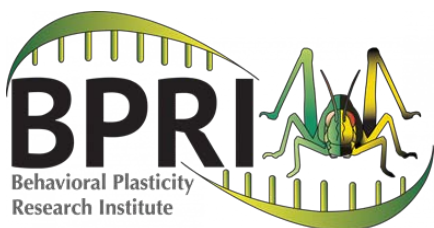
# PROPOSAL CALL FOR BPRI LAB SWAP

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Interdisciplinary Training for Graduate Students

## Behavioral Plasticity Research Institute

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



# **BPRI Lab Swap-Interdisciplinary Training for Graduate Students**

## **Overview of the program**

### **Program Objectives**

The BPRI lab swap research program aims to provide funding for interdisciplinary research for BPRI graduate trainees. Specifically, funds will be provided for projects related to the ten key BPRI research areas. Trainees can propose an individual or group project that achieves one of the following:

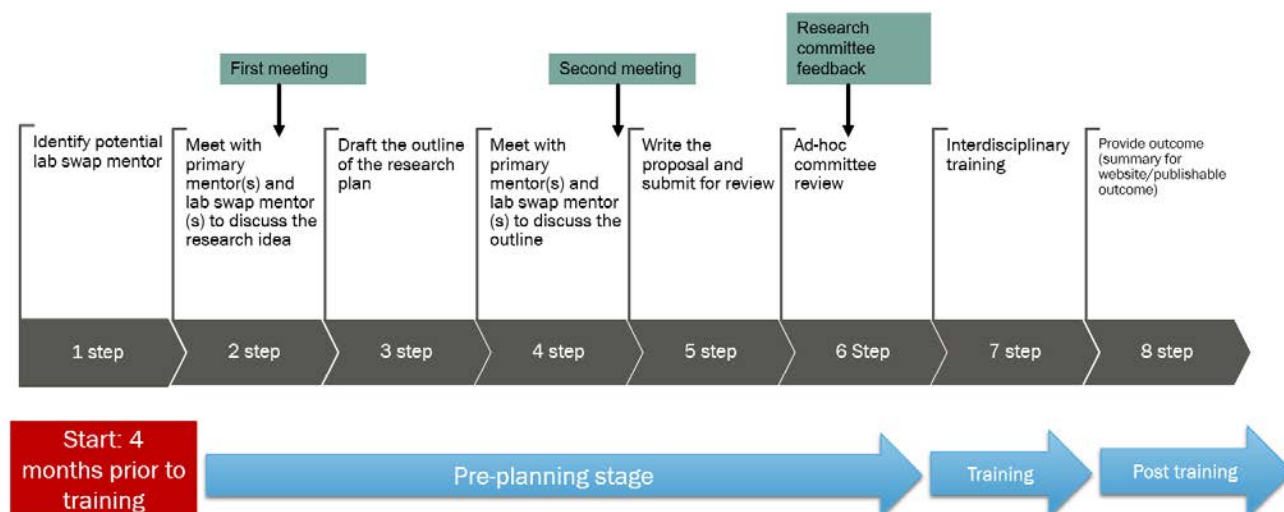
1. Learn new methods and core concepts that benefit future career and research interests.
2. Advance ongoing research activities through collaborative research at other BPRI institutions.
3. Collaborate with BPRI institutional members/trainees to develop an integrative project.

The lab swap program also provides the opportunity for all BPRI graduate students to enhance their research and project management skills. The BPRI strongly encourages all graduate trainees to apply for this program even though participation is not mandatory. Collaborative group projects engaging other trainees are also possible. Collaborative grants will receive additional support.

### **Ten Research Areas on BPRI**

- 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. 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

## Steps for Applying



## Project Duration

Graduate-level research integration often requires a long-term commitment. Thus, the minimum project duration is one year. This includes stages of pre-planning (3 months), interdisciplinary research, and reporting (3 months). 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 (including publication submission) 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. The maximum amount for the collaborative projects is estimated based on the number of trainees engaged in the proposed project ( $(\# \text{ trainees} \times \text{per trainee allocation}) + 500$ ). Trainees are 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 only eligible to receive lab swap funds once. However, they can be engaged in proposed research activities as a collaborator.

## **Proposal Process**

### **Deadline**

Applications for the BPRI lab swap grants are open throughout the year. However, trainees must apply at least 4 months in advance of the planned training activity. The complete application should be submitted to the BPRI education coordinator (Dr. Taniya Koswatta; [taniya.koswatta@ag.tamu.edu](mailto:taniya.koswatta@ag.tamu.edu)).

### **Proposal Preparation Instructions**

The proposal consists of six sections, and each has specific requirements and page limits. Before starting the proposal BPRI trainees are required to communicate with their graduate chair and lab swap mentor to discuss and outline their research idea.

1. Summary
2. Project description
  - a. Objectives/explanation of visit
  - b. Collaboration or integration plan/team role
  - c. Expected outcomes
3. Explanation of career benefits
4. Timeline
5. Budget
6. One-page bio-sketch with a list of publications

### **Proposal Review Process**

The proposal review process has two stages. The first will be conducted by an ad-hoc committee. Trainees can expect to receive reviews 2 weeks after submission. Trainees will then have 2 weeks to modify and resubmit the proposal. The revised proposal will then be rereviewed by the ad-hoc committee a second time. The BPRI research committee members may provide specific recommendations depending on the research scope.

### **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 funds utilization to improve the outcomes.
4. A clear plan for publications.
5. Contribution to trainee career development.

## **Proposal Format**

### **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 (750-1000 words)**

The proposed project should be focused on the objectives of the BPRI lab swap program. The project description should include the following information.

- 1. Objectives:** List the main objectives and a brief literature review that provide context for the research hypothesis and predictions being tested.
- 2. Plan for research collaboration and/or integrations:** Provide a brief synopsis of how different disciplines will be integrated, or how the trainee and PI will collaborate to achieve integration. Further, the proposal should emphasize how the interdisciplinary training would benefit the outcome of the project. If proposing a group project (multiple trainees working on one project), provide the following details.
  - a.** The role of each trainee and how their expertise will be used to implement/improve the outcomes of the project.
  - b.** An explanation of the interdisciplinary training activity for each trainee.
- 3. Expected outcomes:** The proposal must explain the expected outcomes. Outcomes can be a research article, a section or chapter in your thesis or dissertation, a poster, or a conference paper or poster. Outcomes should help the BPRI achieve scientific goals and contribute to its mission.

### **Section 3: Explanation of Career Benefits (150 words per trainee)**

A description of how the proposed interdisciplinary training benefits the career goal of the applicant(s). For group proposals, career benefits for each group member should be explained. The career benefits can be improving skills in particular subject matter or techniques.

### **Section 4: Timeline (one page)**

A timeline should show the research milestones and expected completion dates. It should also include pre-training, exchange visits or lab swap, and post-training activities. Pre-training activities should include two virtual meetings, proposal reviewing, and proposal revision activities. Post-training activities should include a plan for producing publishable products and a 150-200 word summary that will be published on the BPRI website. Additionally, the timeline should show how the research gradually develops and the expected integration stages or collaborative activities.

### **Section 5: Budget (one page)**

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.

### **Section 6: Bio sketch (one page per trainee)**

A one-page bio sketch is required for each trainee. The bio sketch should include educational qualifications, appointments, and products (any publications related to the proposed project)

#### **Responsibilities of Trainee**

- Identify the project scope and develop the proposal.
- Closely communicate with primary mentors and lab swap mentors throughout the project
- After receiving approval, communicate with the lab swap mentor about accommodations and access to the laboratory. It will also be necessary to complete some documents before travel.  
*NOTE: The administrative procedure to get access to specific labs may take up to 1-2 months depending on university protocols.*
- Follow lab safety procedures, institutional rules, and regulations applicable to host institutions
- 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.

## List of Interdisciplinary Experts & Research Areas

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Dr. Anna Childers  
Aiden



Dr. Erez Lieberman

### **Research Area: Genomics**

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

Identify *Schistocerca* genes associated with swarming



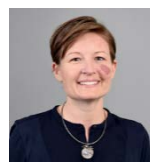
Dr. Olga Dudchenko



Dr. Stephen Richards



Dr. Spencer Behmer



Dr. Arianne Cease

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

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

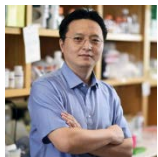
Characterize the following in lab-reared solitary and gregarious phases of *Schistocerca*: nutritional demands and regulation strategies, gut microbiota, migration capacity, fuel use, and thermal performance curves. Compare environments of gregarization zones vs non-outbreak regions using remotely sensed 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

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## List of Contact:

### General information on the program

Dr. Taniya Koswatta: taniya.koswatta@ag.tamu.edu

### Institutional specific information

#### *Arizona State University*

Dr. Arianne Cease: acease@asu.edu

#### *Baylor College of Medicine*

Dr. Fabrizio Gabbiani: gabbiani@bcm.edu

#### *Southern Illinois University Edwardsville*

Dr. Brittany Peterson: bripete@siue.edu

#### *Texas A&M University*

Dr. Hojun Song: Hojun.Song@ag.tamu.edu

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

Dr. Barani Raman: barani@wustl.edu



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<https://behavioralplasticity.org/>

