



Cold  
Spring  
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Laboratory

DNA LEARNING CENTER



# Barcode Long Island Projects *Campaigns*

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# **BLI Projects - Campaigns**

Formulating a team and research ideas

# BLI Guidelines

- Student team (2-4 members, grades 9-12) with a trained, ***BLI mentor***
- BLI mentors
  - Must have attended a DNA barcoding workshop from DNALC
  - Qualified teacher from Long Island (Queens, Kings, Nassau, or Suffolk)
  - Responsible for enforcing BLI and safety protocols, and guiding students through their project

***(including reviewing proposals before submission to DNALC\*)***

# BLI Guidelines

- Project must use *DNA barcoding* to answer some scientific research question.
- Teams should develop a “team name” and a professional scientific title.
- They must then submit a scientific proposal

Refer to full list of guidelines here (*bottom right of page*):

<https://dnabarcoding101.org/resources/>

# Research Topics - Campaigns

- Focus is on:
  - Ants
  - Mosquitoes
  - Beetles
  - Aquatic (freshwater) invertebrates (e.g., insect larvae, etc.)
  - Lichens
  - Fungi

# Research Topics - Campaigns

- **Campaign Rationale:**
  - “Starter” proposal (*suggested grades: 9-10*)
  - Easier entry to scientific writing
  - Focus on a particular group of organisms
  - Appropriate for:
    - Ecological Surveys, BioBlitz
    - Contribution to a larger data pool
    - Longitudinal Analyses – ***make use of the Sample Database!***
  - This does NOT mean a shorter, easier project



# Research Topics - Campaigns

DNA barcoding lends itself to studies involving

**biodiversity and species identification**

*To learn about biodiversity and species identification, check out our video, “DNA Barcoding and Biodiversity”*

# Collection Methods



## Barcoding US Ants

### ANT SAMPLE COLLECTION

#### PROTOCOL

- Collection Guide (PDF): collection and documentation steps. Detailed instructions for different ant collection techniques are summarized.
- Metadata Worksheet (MS Word): use to document observations about site, ants, and ant nests during collection.

#### ANT COLLECTION

- Ant Collection Recommendations by Genus (PDF)
- Regional Species Hit Lists (PDF)
- Collecting Ants: Shawn Dash (PowerPoint)

#### ANT COLLECTION CLINICS

- Collection Clinic, July 20, 2020 Zoom recording:

- Vials (some prefilled 90-95% EtOH)
- Field notebook w/datasheet pencil
- Trowel, gardening shears
- Aspirator
- Forceps (plus extra pair)
- Knife, hive tool or pick to break up material or flip rocks logs, lift bark
- Mobile photo/camera = photos



## Collection Guide

### I. Collect and Document Specimens

The steps below lay out the Collection and Documentation steps of the US Ants Barcoding Project. Detailed instructions for different ant collection techniques are summarized for reference, but not all collection techniques are necessary for all teams. Gear your collection to your geographical area and the ants that you are trying to collect.

Ants belong to a single family, the Formicidae, within the hyper-diverse insect order, Hymenoptera, and they exemplify the importance of insects as ecological indicators with their astounding biodiversity. Ants dominate the ecology of an area with their substantial biomass. They can manipulate species composition, influence trophic interactions, and shape both the abiotic (e.g., through soil shifting) and biotic (e.g., plant-insect interactions) factors affecting an ecosystem. They fill numerous ecological niches taking on the role of predators, mutualists and symbiotic partners, parasites, decomposers and often acting as “keystone species.” Additionally, ants possess a quasi-stable taxonomic and systematic status, creating a situation where species identification is assessable and widely understood. The extant Formicidae contains 21 subfamilies, 411 genera, and more than 15,600 species worldwide. In North America, there are 9 subfamilies, 70 genera, and nearly 800 species.



# Examples of Campaign Projects:

## 1) Ecological Surveys/BioBlitz:

- E.g., Measuring ant diversity in a natural area or aquatic fly larvae in a river to assess ecosystem health
- Collection should be emphasized and many different methods of insect collection should be utilized to capture the “true” diversity in an area

# Examples of Campaign Projects:

## 2) Longitudinal Studies

- E.g., looking at mosquito diversity across Long Island over time in correlation to changing temperatures
- Projects should incorporate the results of previous year's students from the same mentor OR across multiple BLI teams (this data is available via the Sample Database, iNaturalist, gbif, etc.)
- Could think about building range maps or discussing notable changes in species over time.

# Examples of Campaign Projects:

## 3) Taxonomic Studies

- E.g., Investigating the most common families of beetles affected by light pollution across Long Island
- Projects could focus more on classification or even the identification of a new species\*

\***Note:** no project should ever set its goal as the identification of new species unless there is literature support or some compelling reason to believe that new species exist in an area.

## Refrain from these project types

- Bacteria (in any form)
- Vertebrate samples that you need to kill
- Mixed populations
- All the same species
- Multiple samples from the same organism(s)
- Genetic diversity studies
- ***Also, be careful about abundance vs. diversity***



**Now compose your own project idea!!!**

***It's okay if things change***