

Andrew D. Nguyen

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Research Interests

I am broadly interested in understanding the ecological, evolutionary, and genomic determinants of resiliency or susceptibility to climate change.

Education

2012-2017 (expected) PhD, Biology; University of Vermont (Burlington), Department of Biology

Thesis title: Evolutionary innovations of ants to thermally stressful environments

Advisors: Sara Helms Cahan, Nicholas J. Gotelli

Committee: Brent L. Lockwood, Jill Preston

2004-2009 BSc, Biology; Drexel University (Philadelphia)

Awards and Grants

2016 Suiter Prize Travel Award - \$1,000

Publications

1. Helms Cahan S, **Nguyen AD**, Stanton-Geddes J, Penick CA, HernáizHernández Y, DeMarco BB, Gotelli NJ. 2017. Modulation of the heat shock response is associated with acclimation to novel temperatures but not adaptation to climatic variation in the ants *Aphaenogaster picea* and *A. rudis*. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology* 204:113–120.
2. **Nguyen AD**, Gotelli NJ, Cahan SH. 2016. The evolution of heat shock protein sequences, cis-regulatory elements, and expression profiles in the eusocial Hymenoptera. *BMC Evolutionary Biology* 16:15.
3. Stanton-Geddes J, **Nguyen A**, Chick L, Vincent J, Vangala M, Dunn RR, Ellison AM, Sanders NJ, Gotelli NJ, Cahan SH. 2016. Thermal reactionomes reveal divergent responses to thermal extremes in warm and cool-climate ant species. *BMC Genomics* 17:171.

Forthcoming

- **Nguyen AD**, DeNovellis K, Resendez S, Pustilnik J, Gotelli NJ, Parker JD, Helms Cahan S. (2016). Effects of desiccation and starvation on thermal tolerance and the cellular stress response in forest ants. In review at the *Journal of Comparative Physiology B*.

Research Experience

2014 Research Associate; University of Vermont

Determined infection frequency of Trypanosome parasites in Kissing bugs that cause Chagas disease

2010-2011 Technician; Reaction Biology Corp

High through put screening of potentially therapeutic small compounds.

2009-2010 Technician; Morphotek Inc.

Developed therapeutic antibodies against Acute Myeloid Leukemia (AML).

2007-2008 Co-op intern; GlaxoSmithKline

Studied red blood cell differentiation from mouse embryonic stem cells.

2006-2007 Co-op intern; Morphotek Inc.

Developed neutralizing antibodies against Staphylococcal enterotoxin B (SEB).

Skills

Computing:

- *Unix* – General command line, shell bash scripting, and remote computing
- *R* – Data analysis and visualization
- *(R)Markdown* – Integrative word processing and technical reporting
- *Python* – Written scripts to parse genomic data
- *Github* – Reproducible science through version control and online notebooks
- *HTML* – Website development
- *Phylogenetics* - Maximum likelihood (RAxML) and Bayesian (MrBayes)
- *Geneious* – Sequence analysis
- *Microsoft Office* – Data preparation, organization, and word processing

Laboratory:

- RNA,DNA, and protein isolation
- PCR and qPCR
- Gel electrophoresis: polyacrylamide and agarose
- Western blotting; immunohistochemistry
- Cell culture (primary and established lines)
- Flow Cytometry

External Reviewer

Molecular Ecology

Insect Science

Research Presentations

- 2017** *Northern range limits of common forest ants is reflected in trade-offs between basal and induced cold tolerances*, Society of Integrative and Comparative Biology Conference, New Orleans, LA (talk)
- 2016** *Implementing strategies to achieve reproducible research*, BioLunch, University of Vermont, Department of Biology, Burlington Vt (talk)
- 2015** *Temperature adaptations in common woodland ants*, BioLunch, University of Vermont, Department of Biology, Burlington Vt (talk)
- 2014** *Surviving in a warming world: thermal adaptation in ants*, BioLunch, University of Vermont, Department of Biology, Burlington, Vt (talk)
- 2013** *Impact of environmental stress on thermal tolerance in Aphaenogaster picea* EcoLunch, University of Vermont Department of Biology, Burlington, Vt (Talk)
Physiological response to climate change in Aphaenogaster picea , Northeast Natural History-Ant Ecology session, Springfield, MA (Talk)
- 2012** *Heat shock proteins and thermal tolerance in Aphaenogaster picea*, EcoLunch, University of Vermont Department of Biology, Burlington, Vt (Talk)
Sequence and Cis-regulatory Evolution of Heat Shock Protein hsp83, in Social Hymenoptera, International Union for the Study of Social Insects- North American Section Meeting (IUSSI-NAS), Greensboro, NC (Poster)
Heat shock proteins and thermal tolerance in Aphaenogaster rudis, Aphaenophest, Petersham, MA (talk)

Conferences Attended

- 2017** Society of Integrative and Comparative Biology, New Orleans, LA
2016 Evolution, Austin, Texas 2014 Evolution, Raleigh, North Carolina
2014 Molecular Biology and Evolution, Old San Juan, Puerto Rico
2013 Northeast Natural History - Ant Ecology session, Springfield, Massachusetts
2012 International Union for the Study of Social Insects - North American Section Meeting (IUSSI-NAS), Greensboro, North Carolina

Organizational Membership

Society for Integrative & Comparative Biology (SICB)
American Society of Naturalists (ASN)
Society of Molecular Biology and Evolution (sMBE)
International Union for the Study of Social Insects (IUSSI)
Ecological Society of America (ESA)

Teaching Experience

- 2017** **Ecological Genomics** - Teaching Assistant, University of Vermont
2016
Invited Lecture, **Evolution**, University of Vermont,
2015 Invited Lecture, **Evolutionary Biology** for non majors, University of Vermont
2014 Invited Lecture, **Evolution**, University of Vermont

2014 Exploring Biology - Teaching Assistant, University of Vermont
2013 Cell and Molecular Biology - Teaching Assistant, University of Vermont
2012-2014 Ecology and Evolution - Teaching Assistant, University of Vermont
2012 Principles of Biology - Teaching Assistant, University of Vermont

Mentoring

Undergraduate Researchers:

Ariana Maleki and **John Matthew Fisher** worked on developing microsatellites for population genetic work on common woodland ants.

Kerri Pinder, **Skyler Resendez**, and **Jeremy Pustilnik** worked on how previous exposures to starvation and desiccation impact thermal tolerance and underlying stress responses (using heat shock proteins as a proxy).

Teddy Herriman and **Austin Sherburne** worked on identifying potential morphological innovations that may temper and/or mitigate the effects of heat stress.

Curtis A. Provencher worked on how experimental warming affects the stress levels of common woodland ants.

Megan Brown and **Jordan Zitnay** identified trade-offs between constitutive and induced cold tolerances at the northern range boundary in common forest ants, likely constraining their northern expansion.

Outreach

2015 Helper, Software Carpentry, University of Vermont

Helped participants troubleshoot code (Unix command line, R, Github)

2012 Graduate Mentor, Ant Camp, University of Vermont

Aided in communicating and demonstrating ant collecting to high school students