



**Timothy A. Crombie**

**Post-doctoral Researcher  
Northwestern University**

Department of Molecular Biosciences

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## **MAJOR PROFESSIONAL INTERESTS**

Molecular ecology; evolution; genetics

## **EDUCATION**

- 2017-2022 Post-doctoral researcher, Northwestern University  
Advisor: Dr. Erik C. Andersen
- 2016-2017 Post-doctoral researcher, University of Florida  
Advisor: Dr. Chales F. Baer
- 2009-2015 Ph.D. in Zoology, University of Florida  
Advisor: Dr. David Julian
- 1999-2004 B.S. in Biology, Arizona State University

## **AWARDS AND HONORS**

- 2018 Northwestern University Postdoc Professional Development Travel Award
- 2015 Best Graduate Student Oral Presentation, Society for Integrative and Comparative Biology,  
Division of Comparative Physiology and Biochemistry
- 2009-2012 University of Florida Alumni Scholarship recipient
- 2009 University of Florida seed grant for research
- 2008 Honorable Mention, NSF Graduate Research Fellowship
- 2001-2004 Biology Research Experience for Undergraduates Fellowship

## **EMPLOYMENT**

- 2017 - Post-doctoral researcher, Department of Molecular Biosciences at Northwestern University,  
Advisor: Dr. Erik C. Andersen
- 2016 - 2017 Post-doctoral researcher, Department of Zoology at the University of Florida,  
Advisor: Dr. Chales F. Baer
- 2009 - 2016 Graduate Student, Department of Zoology at the University of Florida, Advisor: Dr. David Julian
- 2005 - 2009 Research Technician, University of California, Santa Barbara,  
Supervisor: Dr. Gretchen Hofmann
- 2004 - 2005 Research Technician, Arizona State University, Supervisor: Dr. Michael C. Moore
- 2001 - 2004 Undergraduate Research Assistant, Arizona State University,  
Supervisors: Dr. Gretchen Hofmann, Dr. Michael C. Moore

## PUBLICATIONS

## PREPRINTS:

Fouad AD, Churgin MA, Hayden J, Xu J, Park JI, Liu A, Teng C, Sun H, Parrado M, Bowlin P, De La Torre M, **Crombie TA**, Sedore CA, Coleman-Hulbert AL, Johnson E, Philips P, Andersen EC, and Fang-Yen C (2021). High-throughput imaging of *Caenorhabditis elegans* aging using collective activity monitoring. *bioRxiv*, Posted October 19, 2021. DOI: <https://doi.org/10.1101/2021.10.18.464905>  
*Cell Reports Methods*, Submitted October 28, 2021.

## PEER-REVIEWED:

**Crombie TA**, Battlay B, Tanny RE, Evans KS, Buchanan CM, Cook DE, Dilks CM, Stinson LA, Zdraljevic S, Zhang G, Roberto NM, Lee D, Ailion M, Hodgins KA, and Andersen EC (2022). Local adaptation and spatiotemporal patterns of genetic diversity revealed by repeated sampling of *Caenorhabditis elegans* across the Hawaiian Islands. *Molecular ecology*, 2022 Feb 15; DOI: <https://doi.org/10.1111/mec.16400>

**Crombie TA**, Tanny RE, Buchanan CM, Roberto NM, and Andersen EC (2022). A highly scalable approach to perform ecological surveys of selfing *Caenorhabditis* nematodes. *Journal of Visualized Experiments*, 2022 Mar 1, DOI: <https://doi.org/10.3791/63486>

Di Bernardo M, **Crombie TA**, Cook DE, and Andersen EC (2021). easyFulcrum: An R package to process and analyze ecological sampling data generated using the Fulcrum mobile application. *PloS ONE*, 16, e0254293. DOI: <https://doi.org/10.1371/journal.pone.0254293>

Rajaei M, Saxena AS, Johnson LM, Snyder MC, **Crombie TA**, Tanny RE, Andersen EC, Joyner-Matos J, and Baer CF (2021). Mutability of mononucleotide repeats, not oxidative stress, explains the discrepancy between laboratory-accumulated mutations and the natural allele-frequency spectrum in *C. elegans*. *Genome Research*, DOI: <https://doi.org/10.1101/gr.275372.121>

Nyaanga J, **Crombie TA**, Widmayer SJ, and Andersen, EC (2021). easyXpress: An R package to analyze and visualize high-throughput *C. elegans* microscopy data generated using CellProfiler. *PLoS ONE*, 2021 Oct 6; 16(10):e0254293. DOI: <https://doi.org/10.1371/journal.pone.0252000>

Lee D, Zdraljevic S, Stevens L, Wang Y, Tanny RE, **Crombie TA**, Cook DE, Webster AK, Chirakar R, Baugh LR, Sterken M, Braendle C, Felix M-A, Rockman MV, and Andersen EC (2021). Balancing selection maintains hyper-divergent haplotypes in *C. elegans*. *Nature Ecology and Evolution*, 2021 Apr 5. DOI: <https://doi.org/10.1038/s41559-021-01435-x>

**Crombie TA**, Zdraljevic S, Cook DE, Tanny RE, Brady SC, Wang Y, Evans KS, Hahnel S, Lee D, Rodriguez BC, Zhang G, van der Zwaag J, Kiontke KC, and Andersen EC (2019). Deep sampling of Hawaiian *Caenorhabditis elegans* reveals high genetic diversity and admixture with global populations. *eLife*, 2019 Dec 3; 8. pii: e50465. DOI: <https://doi.org/10.7554/eLife.50465>

Zdraljevic S, Fox BW, Strand C, Panda O, Tenjo FJ, Brady SC, **Crombie TA**, Doench JG, Schroeder FC, and Andersen EC (2019). Natural variation in *C. elegans* arsenic toxicity is explained by differences in branched chain amino acid metabolism. *eLife*, 8. DOI: <https://doi.org/10.7554/eLife.40260>

**Crombie TA**, Saber S, Saxena AS, Egan R, and Baer CF (2018). Head-to-head comparison of three experimental methods of quantifying competitive fitness in *C. elegans*. *PLoS ONE*, 13(10), e0201507. DOI: <https://doi.org/10.1371/journal.pone.0201507>

Yeh SD, Saxena AS, **Crombie TA**, Feistel D, Johnson LM, Lam I, Lam J, Saber S, and Baer CF (2018). The mutational decay of male-male and hermaphrodite-hermaphrodite competitive fitness in the androdioecious nematode *C. elegans*. *Heredity*, 120, 1–12.

- Todgham AE, **Crombie TA**, and Hofmann GE (2017). The effect of temperature adaptation on the ubiquitin–proteasome pathway in notothenioid fishes. *Journal of Experimental Biology*, 220(3), 369–378. DOI: <https://doi.org/10.1242/jeb.145946>
- Crombie TA**, Tang L, Choe KP, and Julian D (2016). Inhibition of the oxidative stress response by heat stress in *Caenorhabditis elegans*. *The Journal of Experimental Biology*, 219 (Pt 14), 2201–2211. DOI: <https://doi.org/10.1016/j.yhbeh.2007.09.022>
- Vasquez MC, **Crombie TA**, and Julian D (2011). Lysosome number and size do not vary during a tidal cycle in erythrocytes of the bloodworm *Glycera dibranchiata*. *Bulletin of the Mount Desert Island Biological Laboratory*, 50: 45–47.
- Kabelik D, **Crombie TA**, and Moore MC (2008). Aggression frequency and intensity, independent of testosterone levels, relate to neural activation within the dorsolateral subdivision of the ventromedial hypothalamus in the tree lizard *Urosaurus ornatus*. *Hormones and Behavior*, 54(1), 18–27.

## PROFESSIONAL PRESENTATIONS (selected since 2011)

- Crombie TA, et al., 2021**. Natural variation in *C. elegans* lifespan and healthspan. Chicago Area Worm Meeting (virtual).
- Crombie TA, et al., 2021**. Repeated sampling of *Caenorhabditis elegans* across the Hawaiian Islands reveals spatiotemporal patterns of genetic diversity. 23rd International *C. elegans* Conference (virtual).
- Crombie TA, et al., 2020**. Deep sampling of Hawaiian *Caenorhabditis elegans* reveals high genetic diversity and four genetically distinct groups. Evolutionary Biology of *Caenorhabditis* and other Nematodes Meeting (virtual).
- Crombie TA, et al., 2019**. Deep sampling of Hawaiian *Caenorhabditis elegans* reveals high genetic diversity and admixture with non-Hawaiian groups. 22nd International *C. elegans* Conference. Los Angeles, CA.
- Crombie TA, et al., 2019**. Massive sampling of *Caenorhabditis elegans* across the Hawaiian Islands reveals remarkable genetic diversity on the islands and admixture with globally distributed populations. Chicago Area Worm Meeting. Chicago, IL.
- Crombie TA, et al., 2018**. Nematode sampling across the Hawaiian Islands reveals niche preferences for *Caenorhabditis elegans* and a new *Caenorhabditis* species. Population, Evolutionary, and Quantitative Genetics Conference. Madison, WI.
- Crombie TA and D Julian, 2016**. Stress tolerance and molecular stress responses in *Caenorhabditis elegans*. Department of Animal Sciences. University of Florida, Gainesville, FL.
- Crombie TA and D Julian, 2015**. Heat and oxidative stress synergize to reduce survival and inhibit expression of stress response genes in the nematode *Caenorhabditis elegans*. Society for Interactive and Comparative Biology, West Palm Beach, FL.
- Crombie TA J Kim, and D Julian, 2015**. Screening for interactions among multiple stressors using response to light as a survival metric. 20<sup>th</sup> International *C. elegans* Meeting. Los Angeles, CA.
- Crombie TA J Kim, and D Julian, 2015**. The interactive effects of multiple stressors on worm performance and gene expression. Florida Worm meeting, Melbourne, FL.
- Crombie TA and D Julian, 2014**. Interactive effects of multiple stressors on fitness and gene expression. Tampa Bay Research Institute, Tampa Bay, FL.
- Crombie TA and D Julian, 2012**. Heat stress temporarily inhibits components of the oxidative stress response and results in elevated toxicity of the redox cycling compound juglone. University of Florida Genetics 2012, Gainesville, FL.
- Crombie TA and D Julian, 2011**. Synergistic interaction between juglone-induced oxidative stress and high-temperature stress in the nematode *C. elegans*. Experimental Biology 2011, Washington, DC.

## PEER REVIEW AND RELATED ACTIVITIES

### Academic Journals

*Comparative Biochemistry and Physiology*

*Genetics*

*Journal of Experimental Gerontology*

*Journal of Experimental Biology*

*PLoS ONE*

*Toxicology*

## PROFESSIONAL AFFILIATIONS AND SERVICE

### Membership in Professional Societies:

Genetics Society of America

### Professional service:

2021 Poster judge, 23rd International *C. elegans* meeting

2019 Organizational team member, Chicago Area Worm Meeting (ChAWM, [www.chawm.org](http://www.chawm.org))

## TEACHING AND ADVISING

### Undergraduate teaching:

2015 Cross-Disciplinary Laboratory (X-lab) ISC2400L and ISC2401L

2014 Cross-Disciplinary Laboratory (X-lab) ISC2400L and ISC2401L

2013 Cross-Disciplinary Laboratory (X-lab) ISC2400L and ISC2401L

### K-12 advising:

2020 Yahya Junejo, Hinsdale Central High School

2020 Shanthi Hegde, Lambert High School

2018 Ethan Schonfeld, Glenbrook North High School

2011-2016 Mentor for Student Science Training Program (SSTP), University of Florida

2012 Abeer ElTemtamy, Spruce Creek High School

2011 Kevin Huang, project entered in 2012 Bay Area Science Fair  
*Awarded 2nd place in the "Biological" category*

### Undergraduate advising and mentoring:

Andrea Phung (2022 - current, Class of 2024), Biological Sciences Major

*2022 Academic Year URG Recipient*

*2022 Summer URG recipient*

Iris Swarthout (2020 - 2021, Class of 2023), Biological Sciences Major

*2020 Summer Internship Grant Program recipient*

*2021 Summer URG recipient*

Kailyn Parham (2019 - 2021, Class of 2021), Biological Sciences Major

*2019 Summer URG recipient*

*2020 Academic Year URG Recipient*

*2021 Academic Year URG Recipient*

***Undergraduate advising and mentoring (Continued):***

Anna Derrick (2019 - 2020, Class of 2021), Biological Sciences Major  
*2019 Weinberg College Summer Grant recipient*

Zyneb Adewusi (2018, Class of 2018), Biological Sciences Major, Moraine Valley Community College  
*2018 Summer Research Opportunities Program (SROP) recipient*

Yihong Hu (2018 - 2019, Class of 2021), Biological Sciences Major  
*2018 Program in Biological Sciences Summer Grant recipient*

Chido Chikuduruzi (2017-2018, Class of 2018), Biological Sciences Major, Northeastern Illinois University

Anne Laird (2017, Class of 2022), University of Florida

Thomas Brenner (2013 - 2014, Class of 2016), University of Florida

Stanley David Stupski (2012 - 2014, Class of 2014), Science for Life program, University of Florida

Zachary Field (2011 - 2013, Class of 2014), University of Florida

Bo Idsardi (2011 - 2012, Class of 2012), University of Florida

Breanna Sipley (2009 - 2010, Class of 2013), University of Florida