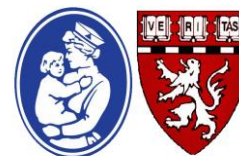


# STEPHEN B. TREASTER, Ph.D.

Stephen\_Treaster@hms.harvard.edu || 321-345-6565  
Department of Genetics, Harvard Medical School  
Department of Orthopedics, Boston Children's Hospital



Geneticist and bioinformatician with a focus on aging and age-related diseases, leveraging natural examples of exceptional longevity to decipher mechanisms of senescence resistance. Animals that resist the rigors of time well past a human lifespan, that maintain health and function for centuries, will inform therapies to prevent aging and age-related diseases in people. Research spans computational biology and functional characterization in small lab models.

## EDUCATION & EXPERIENCE

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### Postdoctoral Research Fellow at Harvard Medical School

10/17-Present

Mentor: *Dr. Matthew Harris*

Comparative genomics of longevity across Rockfish, with lifespans from 11 to over 200 years, Bivalves up to 507 years, Gobies down to 45 days, across mammals, and within human populations. My generation, analysis, and intersection of these diverse genomic resources has identified specific pathways underlying the evolution of longevity, including hitherto unappreciated aging architecture that is shared across the tree of life, including humans.

In analyzing these diverse genomic resources, I identified shortcomings in existing tools and thus developed my own convergence tool, TRACCER, with the key features of being agnostic to ancestral state and correcting for both sampling bias and short-branch artifacts. These features have enabled increased precision and sensitivity, which I have benchmarked against existing tools, and identified the ancestral state of rockfish to be long-lived, contrary to assumptions of the field to date.

Created a cost-efficient zebrafish epigenetic clock, robust to strain, size, sex, and husbandry. This resource will empower my mechanism validation efforts, as well as zebrafish labs worldwide to investigate mechanisms of aging at minimal cost.

Currently investigating the pathways identified in these projects to extend lifespan and healthspan in conventional models and accelerated aging zebrafish mutants.

### Owner and Developer of BlotSpotter.com

03/15-01/17

Conceived, developed, and hosted a webtool for the automatic analysis of western blots, reducing a twenty-minute task to two minutes, while minimizing user bias.

### Consulting Scientist at the University of Alabama at Birmingham

07/14-12/14

Knowledge transfer and research in comparative gerontology and proteostasis.

### University of Texas Health Science Center at San Antonio, TX

09/09-05/14

Ph.D. in Molecular Medicine: Barshop Institute for Longevity

Mentor: *Dr. Steven Austad*

Biochemical adaptations associating with exceptional longevity in bivalves, including the discovery of unprecedented protein stability in *Arctica islandica*.

### University of Connecticut, Storrs, CT

09/05-05/09

B.S. in Molecular and Cell Biology, *magna cum laude*, Honors Program

Three minors, in Bioinformatics, Chemistry, and Philosophy

Honors Project: Independent experimental research and thesis on the differentiation and characterization of nuclear transfer derived embryonic stem cells.

## GRANTS AWARDED

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|   |             |
|---|-------------|
| National Academy of Medicine Healthy Longevity Accelerator: <u>\$187,500*</u>           | 10/21       |
| National Academy of Medicine Healthy Longevity Catalyst: <u>\$50,000*</u>               | 10/20       |
| *Awards are multi-stage competitions, setting up for a large multiyear grant in 2024-25 |             |
| Dovetail Tree of Life Genome Competition: <u>\$15,000</u>                               | 10/20       |
| Harvard Medical School Genetics Climate Change Fellowship: <u>\$100,000</u>             | 11/19       |
| Glenn/AFAR Postdoctoral Fellowship in Aging Research: <u>\$60,000</u>                   | 07/18       |
| NIH/NIA T32 AG21890 “ <i>Training Grant on the Biology of Aging</i> ”: <u>\$50,000</u>  | 01/13-05/14 |

## CURRENT PROJECT FUNDING SUBMITTED

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*Genetic and epigenetic regulation of aging and resilience in the zebrafish*

R01 1R01AG084614-01. PI: Dr. Matthew Harris

Helped construct and write an R01 currently under review at NIH, investigating the modulation of lifespan and healthspan in zebrafish. This includes establishing two mutant zebrafish lines as experimental aging platforms, one deficient for stem-cell maintenance, the other telomere maintenance, a remarkable telomere-independent suppression of the latter, genetic interventions guided by comparative genomics, and our new zebrafish epigenetic clock.

*New Genetic Insights into the Regulation of Exceptional Longevity*

Longevity Impetus Grant. PI: Dr. Matthew Harris

Helped construct and write extramural funding grant, investigating the use of bivalve molluscs as an experimental platform for genetic analysis of development and life-history traits. Over 500 million years of evolution, bivalves have advanced unique adaptations that we have no understanding of, including the ability to survive for five centuries, and thus must include mechanisms to stave off aging and aging pathologies.

## OTHER AWARDS AND HONORS

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|--|-------------|
| AQMHD 2022 Postdoctoral Presentation Prize: <u>\$600</u>                         | 10/22       |
| Boston Children’s Hospital Postdoc Association Travel Award (AGE): <u>\$1000</u> | 06/19       |
| UTHSCSA Molecular Medicine First Year Award: <u>\$5000</u>                       | 09/09       |
| UConn New England Scholar  | 09/05-05/09 |
| UConn Honors Undergraduate Program   | 09/05-05/09 |
| UConn Leadership & Academic Achievement Scholarship                              | 09/05-05/09 |
| UConn SURF and Treibick Scholar Awards: <u>\$4000</u>                            | 05/07-09/08 |

## TEACHING AND LEADERSHIP

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**Biology of Aging, Woods Hole 2023:** Helped organize and teach a two-week intensive Biology of Aging course and lab at the Woods Hole Marine Biological Laboratory. Developed course projects and materials, lectured, and trained students in computational and genetic experiments in aging.

**Boston Children’s Hospital Postdoctoral Association Networking and Outreach Committee 2017-2020:** Organized events and solicited funding to establish a postdoc community beyond the lab, alleviating academic and cultural isolation with friendly, inclusive opportunities for socializing, networking, and scientific exchange.

**Teaching assistant for Modern Methods in Molecular Medicine 2012:** Led discussion and review groups of course materials. Provided critiques of writings and presentations.

**Teaching assistant for Advanced Molecular and Cellular Biology 2011:** Led discussion and review groups of course materials. Provided critiques of writings and presentations.

## PUBLICATIONS

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- Castro J., Fagerstrom, K., **Treaster S.**, Duryea J., Charles J., Harris MP. *The function and regulation of celsr1a in skeletal age-associated homeostasis and repair*. Journal of Gerontology: Biological Sciences (In Review-2024)
- Treaster S.**, Deelen J., Daane J., Murabito J., Karasik K., Harris MP. *Convergent genomics of longevity in rockfishes highlights the genetics of human life span variation*. Science Advances (2023)
- Treaster S.**, Daane J., Harris MP. *Refining Convergent Rate Analysis with Topology in Mammalian Longevity and Marine Transitions*. Molecular Biology and Evolution (2021)
- Treaster S.**, Karasik, D., and Harris, MP. *Footprints in the Sand: Deep Taxonomic Comparisons in Vertebrate Genomics to Unveil the Genetic Programs of Human Longevity*. Frontiers in Genetics (2021)
- Peskin B., Henke K., Cumplido N., **Treaster S.**, Harris M., Bagnat M., Arratia G. *Notochordal Signals Establish Phylogenetic Identity of the Teleost Spine*. Current Biology (2020)
- Li C, Barton C, Henke K, Daane J, **Treaster S.**, Caetano-Lopes J, Tanguay RL, Harris MP. *celsr1a is essential for tissue homeostasis and onset of aging phenotypes in the zebrafish*. eLife (2020)
- Treaster, S.B.**, Chaudhuri, A.R., Austad, S.N. *Longevity and GAPDH Stability in Bivalves and Mammals: A Convenient Marker for Comparative Gerontology and Proteostasis*. PLoS ONE (2015)
- Treaster, S.B.**, Ridgway, I.D., Richardson, C.A., Gaspar, M.B., Chaudhuri, A.R., and Austad, S.N. *Superior proteome stability in the longest-lived animal*. AGE (now GeroScience) (2014)
- Zhang, Y., Bokov, A., Gelfond, J., Soto, V., Ikeno, Y., Hubbard, G., Diaz, V., Sloane, L., Maslin, K., **Treaster, S.**, Rendon, S., van Remmen, H., Ward, W., Javors, M., Richardson, A., Austad, S., Fischer, K. *Rapamycin extends life and health in C57BL/6 mice*. J. Gerontol. A. Biol. Sci. Med. Sci. (2014)
- Sung, L.-Y., Chang, C.-C., Amano, T., Lin, C.-J., Amano, M., **Treaster, S.B.**, Xu, J., Chang, W.-F., Nagy, Z.P., Yang, X., et al. *Efficient derivation of embryonic stem cells from nuclear transfer and parthenogenetic embryos derived from cryopreserved oocytes*. Cell. Reprogramming (2010)

## PRESENTATIONS

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- Invited Future Speaker:** GMGI Science Forum 2024. Title Unset.
- Speaker:** Rockefeller University 2024. *Forward Genetics and Genomics-leveraging natural experiments to uncover regulation of longevity*
- Speaker:** AGE 2024. *Insights from the edge: Genetic analysis of exceptionally long- and short-lived species to reveal the regulation of human aging*.
- Lecturer/Speaker:** Marine Biological Laboratory Biology of Aging Course 2023
- Speaker:** Harvard Medical School Genetics 2023
- Speaker:** Genomes of Animals and Plants (GAP) 2022. *Genomics of exceptional longevity and its variation in *Arctica islandica**.
- Speaker:** Aquatic Models of Human Disease (AQMHD) 2022. *Genomics of exceptional longevity and its variation in *Arctica islandica**.
- Speaker:** Harvard Medical School Genetics 2022. *Leaving no stone unturned: Exceptional longevity in rockfish refines the genetics of human lifespan variation*.

**Speaker:** National Academy of Medicine Healthy Longevity Conference Sept. 2021. *Exceptional longevity in Rockfishes as a decoder for lifespan variation in humans.*  
**Speaker:** Methuselah Health: Why We Age 2020. *Proteostasis is a signature of longevity.*  
**Speaker:** AGE 2019. *Comparative genomics of exceptional longevity in rockfish.*  
**Speaker:** Harvard Genetics 2019. *Comparative genomics of exceptional longevity.*  
**Speaker:** Aquatic Models of Human Disease Conference (AQMHD) 2014. *Superior proteostasis in the world's longest-lived animal.*  
**Posters:** Countless, with numerous best-poster awards.

## PRESENTATIONS IN THE POPULAR MEDIA

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"노화도 질병, 치료해 110세까지"...수퍼센티네리언 시대 온다. 8/18/24. *Chosun Daily*  
<https://www.chosun.com/economy/weeklybiz/2024/08/15/JO75RMO4FRARPHUPUKMRQQ6HLI/>

New science of Aging. 9/3/23. *Sunday Boston Globe*  
<https://www.bostonglobe.com/2023/09/03/opinion/my-heartening-summer-school-class-new-science-aging/>

These Fish Could Help Us Live Longer — If We Don't Eat Them All First. *Bloomberg*  
<https://www.bloomberg.com/opinion/articles/2023-05-12/how-long-can-humans-live-rockfish-could-help-us-age-healthily>

New genetic pathways involved in aging. 05/2023. *Drug Discovery News*  
<https://www.drugdiscoverynews.com/new-genetic-pathways-involved-in-aging-15668>

Rockfish genes hold clues to human longevity. 01/2023. *The Scientist*  
[www.the-scientist.com/news-opinion/rockfish-genes-hold-clues-to-human-longevity-70889](http://www.the-scientist.com/news-opinion/rockfish-genes-hold-clues-to-human-longevity-70889)

What rockfish genes can teach humans about living past 100. 01/2023. *Popular Science*  
[www.popsoci.com/science/rockfish-genes-human-longevity/](http://www.popsoci.com/science/rockfish-genes-human-longevity/)

Die Gene langlebiger Fische. 01/2023. *German Public Radio*  
[www.deutschlandfunk.de/langlebige-fische-und-die-genetik-des-alterns-100.html](http://www.deutschlandfunk.de/langlebige-fische-und-die-genetik-des-alterns-100.html)

Warum manche Fische extrem alt werden. 01/2023. *Austrian Public Radio*  
Radiobroadcast (starts at 1:43): <https://oe1.orf.at/programm/20230112/705692/Musik-Langlebigkeit-Psychologie>  
Text: <https://science.orf.at/stories/3217070/>

## OTHER

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**Ad Hoc Reviewer:** eLife; Scientific Reports; Frontiers in Aging; Molecular Biology and Evolution; BMC Genomics; Cellular and Molecular Life Sciences; Evolution, Development and Ecology of Anemonefishes; Model Organisms for Marine Science

**Grant Reviewer** for TIME Initiative: Accelerating Talent in Aging Biology with AFAR 2023.

**Grant Reviewer** for NAM Healthy Longevity Catalyst Awards 2024.

**Webdev:** Created and maintain the website for the Harris Laboratory (fishbonelab.org).

**Public Outreach:** Science by the Pint presenter: Harvard Science “In The News” Student Org.

## REFERENCES

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### *Postdoctoral Mentor*

Dr. Matthew Harris  
Associate Professor  
Department of Genetics  
Harvard Medical School  
[harris@genetics.med.harvard.edu](mailto:harris@genetics.med.harvard.edu)

Bar-Ilan University, Israel  
[david.karasik@biu.ac.il](mailto:david.karasik@biu.ac.il)

### *Graduate Mentor*

Dr. Steven Austad  
Distinguished Professor and Department Chair  
Protective Life Endowed Chair in Healthy Aging  
Department of Biology  
University of Alabama at Birmingham  
[austad@uab.edu](mailto:austad@uab.edu)

### *Collaborator*

Dr. David Karasik  
Associate Scientist  
H&A Marcus Institute for Aging Research

