

Tsvetan R. Bachvaroff  
Research Associate Professor  
University of Maryland Center for Environmental Science  
Institute of Marine and Environmental Technology  
701 E. Pratt St.  
Baltimore, MD 21202  
[bachvaroff@umces.umd](mailto:bachvaroff@umces.umd)

Phone: 301 367 0559  
Fax: 410 234 8896

### Education

2004 Ph.D. degree: Cell Biology and Molecular Genetics, University of Maryland College Park.  
Advisor: Dr. Charles Delwiche. Thesis title: “The Origin of the Dinoflagellate Plastid”

1992 Certificate in Emergency Medical Services: Baltimore City Community College.

1990 B.A. degree: Humanities, Johns Hopkins University.

### Work Experience

2013-Present Research Assistant Professor, University of Maryland Center for Environmental Science at the Institute for Marine & Environmental Technology

2007-2012 Post-doctoral fellow of the Smithsonian Institution, Advisor Dr. D.Wayne Coats

2004-2007 Post-doctoral fellow: Center of Marine Biotechnology, Advisor Dr. Allen Place.

2000-2004 Research Assistant: University of Maryland College Park.

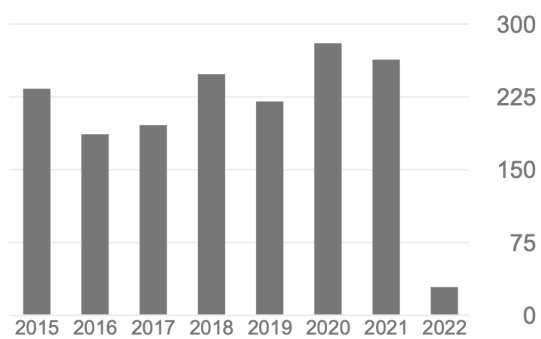
1996-2000 Teaching Assistant: Plant Physiology and Advanced Cell Biology.

1992-1996 Paramedic: Baltimore City Fire Department.

### •Citation metrics:

From google scholar:

Citations per year



	All	Since 2017
Citations	2900	1241
h-index	30	20
i10-index	43	34

**Publications** (highlight encoding: *IMET faculty*, graduate student or undergraduate coauthor)

Amanda Lawrence, Shadaesha Green, Tao Wang, Tsvetan Bachvaroff, and *J. Sook Chung*, Seasonal changes in the expression of insulin-like androgenic hormone (IAG) in the androgenic gland of the Jonah crab, *Cancer borealis* PLOS ONE (in press)

Elena Legrand, Tsvetan Bachvaroff, Tracey B. Schock, *J. Sook Chung*, Understanding molt control switches: Transcriptomic and expression analysis of the genes involved in ecdysteroidogenesis and cholesterol uptake pathways in the Y-organ of the blue crab, *Callinectes sapidus* PLOS ONE 2021 <https://doi.org/10.1371/journal.pone.0256735>

Ernest P Williams , Tsvetan R Bachvaroff, *Allen R Place*, A Global Approach to Estimating the Abundance and Duplication of Polyketide Synthase Domains in Dinoflagellates 2021 Evolutionary Bioinformatics <https://doi.org/10.1177/11769343211031871>

Tsvetan R Bachvaroff, Ryan C McDonald, Louis V Plough, *J Sook Chung*. Chromosome-level genome assembly of the blue crab, *Callinectes sapidus* (2021) G3 Genes|Genomes|Genetics, Volume 11, Issue 9, September 2021, jkab212, <https://doi.org/10.1093/g3journal/jkab212>

JL Wolny, TA Egerton, SM Handy, WL Stutts, JL Smith, EB Whereat, **TR Bachvaroff**, DW Henrichs, L Campbell, JR Deeds. Characterization of *Dinophysis* spp. (Dinophyceae, Dinophysiales) from the mid-Atlantic region of the United States, Journal of Phycology 2020, 56 (2), 404-424

*JS Chung*, X Huang, **TR Bachvaroff**, A Lawrence, JS Pitula, R Jagus. Reovirus Infection Changes Transcript Levels of Eukaryotic Translation Initiation Factor 4E (eIF4E) Family Members and eIF4E-Binding Protein (4E-Bp) in the Blue Crab *Callinectes sapidus*. Journal of Shellfish Research 2019, 38 (1), 23-34

D Tizabi, A Sosa, **T Bachvaroff**, *RT Hill*. Draft Genome Sequences of Three Sponge-Associated Actinomycetes Exhibiting Antimycobacterial Activity. Microbiology resource announcements 2019 8 (34), e00858-19

*EJ Schott*, S Di Lella, **TR Bachvaroff**, LM Amzel, *GR Vasta*. Lacking catalase, a protistan parasite draws on its photosynthetic ancestry to complete an antioxidant repertoire with ascorbate peroxidase, BMC evolutionary biology 2019, 19 (1), 146

**Tsvetan Bachvaroff**. A precedented nuclear genetic code with all three termination codons reassigned as sense codons in the syndinean *Amoebophrya* sp. ex *Karlodinium veneficum*, PLoS One 2019, 14(2): e0212912. <https://doi.org/10.1371/journal.pone.0212912> 2019

Saddef Haq, **T.R. Bachvaroff**, and *A.R. Place*. Characterization of Acetyl-CoA Carboxylases in the Basal Dinoflagellate *Amphidinium carterae*. Mar. Drugs 2017, 15(6), 149

Ernest Williams, *Allen Place*, **Tsvetan Bachvaroff**. Transcriptome analysis of core dinoflagellates reveals a universal bias towards “GC” rich codons Mar. Drugs 2017, **15**(5), 125

J. D. Rodriguez, S. Haq, **T. Bachvaroff**, K. F. Nowak, S. J. Nowak, D. Morgan, V. V. Cherny,, M. M. Sapp, S. Bernstein, A. Bolt, T.E. DeCoursey, A.R.Place, S.M.E. Smith . 2017

Identification of a vacuolar proton channel that triggers the bioluminescent flash in dinoflagellates PLoS One <http://dx.doi.org/10.1371/journal.pone.0171594>

Janouskovec, J., G.S. Gavelis, F. Burki, D. Dinh, **T.R. Bachvaroff**, S.G. Gornik, K.J. Bright, B. Imanian, S.L. Strom, C.F. Delwiche, R.F. Waller, R.A. Fensome, B.S. Leander, F.L. Rohwer, and J.F. Saldarriaga, Major transitions in dinoflagellate evolution unveiled by phylotranscriptomics. Proc Natl Acad Sci U S A, 2017. **114**(2): p. E171-E180.

Kathleen M. Gillespie, **Tsvetan R. Bachvaroff**, *Rosemary Jagus* Expansion of eIF4E and 4E-BP family members in Deuterostomes in “Evolution of the Protein Synthesis Machinery and Its Regulation” Springer International Publishing, Switzerland. 2016. Greco Hernandez and Rosemary Jagus Eds. (2016)

Greco Hernandez, Kathleen M. Gillespie, **Tsvetan R. Bachvaroff**, *Rosemary Jagus*, Catia Igreja, Daniel Peter, Manuel Bulfoni, Bertrand Cosson Evolution of eIF4E-Interacting Proteins in “Evolution of the Protein Synthesis Machinery and Its Regulation” Springer International Publishing, Switzerland. 2016, Greco Hernandez and Rosemary Jagus Eds. (2016)

Xiaoshuai Huang, Sun-Hye Bae, **Tsvetan R. Bachvaroff**, *Eric J. Schott*, Haihui Ye, *J. Sook Chung* Does a blue crab putative insulin-like peptide binding protein (ILPBP) play a role in a virus infection? Fish and Shellfish Immunol (2016) 58: 340-348

Emily M. Flowers, **Tsvetan R. Bachvaroff**, Janet V. Warg, John D. Neill, Mary L. Killian, Anapaula S. Vinagre, Shanai Brown, Andréa Santos e Almeida, *Eric J. Schott* (2016) Genome Sequence Analysis of CsRV1: A Pathogenic Reovirus that Infects the Blue Crab *Callinectes sapidus* Across Its Trans-Hemispheric Range. (2016) Front Microbiol. 7: 126.

B. Bentlage, *T.S. Rogers*, **T.R. Bachvaroff**, C.F. Delwiche (2016) Complex ancestries of Isoprenoid synthesis in dinoflagellates. Journal of Eukaryotic Microbiology 63:123-137

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**Tsvetan R. Bachvaroff**, Ernest Williams, *Rosemary Jagus*, and *Allen R. Place*, A cryptic noncanonical multi-module PKS/NRPS found in dinoflagellates; pp. 101--104 A. Lincoln MacKenzie (Ed.) 2015. Marine and Freshwater Harmful Algae. Proceedings of the 16 International Conference on Harmful Algae, Wellington, New Zealand Cawthron Institute and International Society for the Study of Harmful Algae.

Grant D Jones, Ernest P Williams, **Tsvetan R Bachvaroff**, Allen R Place and Rosemary Jagus, Translating the message: *Karlodinium veneficum* possesses and expanded toolkit of protein translation initiation factors; pp. 237--240 A. Lincoln MacKenzie (Ed.) 2015. Marine and Freshwater Harmful Algae. Proceedings of the 16 International Conference on Harmful Algae, Wellington, New Zealand Cawthron Institute and International Society for the Study of Harmful Algae.

Chiguang Feng, Anita Ghosh, Mohammed N. Amin, **Tsvetan R. Bachvaroff**, Satoshi Tasumi, Marta Pasek, Aditi Banerjee, Surekha Shridhar, Lai-Xi Wang, Mario A. Bianchet, and *Gerardo R. Vasta* (2015) The Galectin CvGal2 from the Eastern Oyster (*Crassostrea virginica*) Displays

- Unique Specificity for ABH Blood Group Oligosaccharides and Differentially Recognizes Sympatric *Perkinsus* Species; *Biochemistry*. 54:4711-30
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- T.R. Bachvaroff**, S.G. Gornik, G.T. Concepcion, R. F. Waller, G.S. Mendez, J. C. Lippmeier, C.F. Delwiche (2014) Dinoflagellate phylogeny revisited: Using ribosomal proteins to resolve deep branching dinoflagellate clades. *Molecular Phylogenetics and Evolution* **70**: 314-322
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- J. Sook Chung, **T.R. Bachvaroff**, J. Trant, and A. Place, (2012) A second copper zinc superoxide dismutase (CuZnSOD) in the blue crab *Callinectes sapidus*: Cloning and up-regulated expression in the hemocytes after immune challenge, *Fish & Shellfish Immunology* 32: 16-25
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- Hoppenrath M, **Bachvaroff TR**, Handy SM, Delwiche CF and BS Leander. (2009) Molecular phylogeny of the ocelloid-bearing dinoflagellates (Warnowiidae) as inferred from SSU and LSU rDNA sequences. *BMC Evolutionary Biology*, 9: 116.
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- Bachvaroff, T. R.**, and Place, A. R. 2008. From stop to start: Tandem gene arrangement, copy number and splicing sites in the dinoflagellate *Amphidinium carterae*. *PLoS One* 3(8):e2929
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Sánchez Puerta, M. V., T.R.Bachvaroff, C.F. Delwiche. 2007 Sorting Wheat from Chaff in Multi-gene Analyses of Chlorophyll c-containing Plastids, Molecular Phylogenetics and Evolution

**T.R. Bachvaroff**, J.E. Adolf, and A.R. Place, 2007 Phylogeography of Atlantic Coast *Karlodinium veneficum* Strains: A Genetic Marker Correlate of Toxin Type. Proceedings of the XII conference on Harmful Algae, Copenhagen Denmark. Pages 55-58

Place, A. R., Brownlee, E. F., Sellner, S. G., Sellner, K. G., Nonogaki, H., Adolf, J. E., and **Bachvaroff, T. R.**, (2007). Bivalve responses to ichthyotoxic *Karlodinium veneficum* (Ballantine). Proceedings of the 12th International Conference on Harmful Algae, Copenhagen Denmark Pages 5-8.

Adolf, J. E., **Bachvaroff, T. R.**, and Place, A. R. (2007) Manger à trois : Toxic vs. non-toxic *Karlodinium veneficum* strains with a predator, *Oxyrrhis marina*, and prey, *Stoeatula major*. Proceedings of the 12th International Conference on Harmful Algae, Copenhagen Denmark. Pages 107-110

X. Bai, J. E. Adolf, **T.R. Bachvaroff**, A. R. Place, and D. W. Coats 2007 The interplay between host toxins and parasitism by *Amoebophrya* Harmful Algae, 6; 670-678

Adolf, J. E., **Bachvaroff, T.R.**, Krupatkina, D.N., and Place, A.R., 2007 Karlotoxin mediates grazing of *Oxyrrhis marina* on *Karlodinium veneficum* strains. Harmful Algae 6; 400-412

Adolf J.E., **T.R. Bachvaroff**, D.N. Krupatkina, A.R. Place, P.J.P. Brown, and A. J. Lewitus. 2006. Species specificity and potential roles of *Karlodinium micrum* toxin. African Journal of Marine Science 2006 28, 415-421.

Shalchian-Tabrizi, K., M. Skånseng, F. Ronquist, D. Klaveness, **T.R. Bachvaroff**, C.F. Delwiche, A. Botnen, T. Tengs, K.S. Jakobsen. 2006. Covarion structure in rhodophyte-derived second-hand plastid genes: implications for addressing the origin and evolution of dinoflagellate plastids. Molecular Biology and Evolution, 23: 1504-1515).

**Bachvaroff T.R.**, M.V. Sanchez-Puerta, C.F. Delwiche. 2006. The evolutionary rate of plastid genes reflects their history of transfer. Journal of Molecular Evolution 62:42-52

**Bachvaroff T.R.**, M.V. Sanchez-Puerta, C.F. Delwiche. Chlorophyll c containing plastid relationships based on analyses of a multi-gene dataset with all four chromalveolate lineages. 2005. Molecular Biology and Evolution 22:1772-82.

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**In review**

A Global Approach to Estimating the Abundance and Duplication of Polyketide Synthase Domains in Dinoflagellates Ernest P. Williams, Tsvetan R. Bachvaroff, and Allen R. Place

**In preparation:**

Blue crab genome: Bachvaroff, TR, L. Plough, J. S. Chung, Chromosome assembly of the blue crab, *Callinectes sapidus* (Gigascience)

Transcriptomic and expression analysis of the genes involved in ecdysteroidogenesis and cholesterol uptake pathways in the Y-organ of the blue crab, *Callinectes sapidus* Elena Legrand , Tsvetan Bachvaroff, Tracey B. Schock, J. Sook Chung

**•Mentoring**

Post-doc Ryan McDonald (Blue crab genome project)

Graduate student: Ernest Williams (co-advised with Dr. Place)

High School Teachers: Felicia Schrader (Tides / Aquarium), Erin Frye (Tides / Aquarium);

Undergraduates: Jasmine Smalls (LMSCRC), Rachel Banks (LMSCRC, two summers), Deandrae Howard (LMSCRC), Eric Mazur (Tides / Aquarium), Nick McKinley (Tides / Aquarium); Chima Iwuji, Langston Gash, Ben Decre

High school: Park student, Eric Sibanda,

Volunteer: Danara Krupatkina

Pre IMET:

Kelly Garton, Jennie Roe;

HHMI funded undergraduates: Ernest Williams, Ali Tabatai; REU funded: Greg Concepcion;

Other undergrads: Carolyn Rogers, Nancy Feissner,

**Student Committees**

David Marsan, MEES (2016); Gregory Mendez (2016) CBMG; Detbra Rosales (2020), UMES; Kristen Lycett, UMES (2017); Mengqi Sun MEES; Saddeff Haq, GPILS toxicology (2018); Ana Sosa, MEES; Tao Wang, UMCES; Anya Byrd, UMCES (All PhD)

**Teaching**

Lectures in MEES 608 and 698; Co-teaching MEES708 with Yantao Li “Algal Bioenergy and biodiversity”, MEES618C Next Generation Sequence analysis

**Reviewer for:**

Aquatic Microbial Ecology, BMC Genomics, Chinese Journal of Oceanography and Limnology, Eukaryotic Cell, Harmful Algae, European Journal of Parasitology, Journal of Molecular Evolution, Journal of Eukaryotic Microbiology, Journal of Phycology, Journal of Plankton Research, Marine Ecology Progress Series, Nature Communications, Phycological Research,

Proceedings of the National Academy of Sciences, Protist, Molecular Biology and Evolution, Systematic Biology, and DOE & NSF grant proposals.

Volunteer: Jones Falls Watershed Association (2003-2011)

Member of the Phycological Society of America & Society of Protozoology

### **Awards**

2018 Outstanding Faculty Mentor Award from UMCES graduate students

2011 William Trager Award from the Journal of Eukaryotic Microbiology / International Society of Protistologists

2002 Best Graduate student poster, Bioscience day, University of Maryland College Park.

2002 Marsho award for best student presentation, Mid-Atlantic Section of the American Society for Plant Biology.

1999 Outstanding Teacher's Assistant Award, Center for Teaching Excellence, University of Maryland College Park.

1985 Chemistry Prize, Trinity School, New York.

### **Collaborations**

John Dolan (CNRS – VilleFranché Sur Mer, France), Mona Hoppenrath (DZMB – Germany), Myung-Gil Park Chonnam National University, Republic of Korea, Laure Guillou (CNRS – Roscoff, France), Sara Handy & Jon Deeds (JIFSAN, FDA): Phylogeny of dinoflagellates.

Erich Schott, UMCES; Charmaine Dahlenberg, NAIB; Baltimore Undergrounds Science Space, Lisa Moren UMBC: Harbor diversity.

J Sook Chung and Louis Plough, UMCES: Blue Crab Genome