

JERNEJ TURNŠEK, PhD

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I am a phytoplankton molecular and cell biologist drawing my scientific inspiration from the diversity of biominerals across the tree of life. The overarching ambition of my research is to understand molecular, cellular, and evolutionary underpinnings of phytoplankton biomineralization, how these processes tie into elemental cycles sustaining oceanic and planetary health, and to turn this knowledge into medical, industrial, and environmental applications.

EDUCATION

Harvard University Jan. 2020
PhD, Biological and Biomedical Sciences, *Advisors: Andrew E. Allen, PhD, Pamela A. Silver, PhD*
Dissertation: Towards Subcellular Proteomic Maps in Model Marine Diatoms

University of Ljubljana June 2012
MSc, Biotechnology, *Advisor: Roman Jerala, PhD*
Thesis: Synthetic Biology Approach Towards Improvement of Carotenoid Biosynthetic Pathway Using Zinc Fingers

FUNDING

The Gordon and Betty Moore Foundation Grant GBMF4958 | \$401,010 Aug. 2015–July 2018

PUBLICATIONS

Turnšek J, Brunson JK, Martinez Viedma MP, Deerinck TJ, Horák A, Oborník M, Bielinski VA, Allen AE. 2021. Proximity proteomics in a marine diatom reveals a putative cell surface-to-chloroplast iron trafficking pathway. *eLife* 10:e52770.

Faktorová D, Nisbet RER, Fernández Robledo JA, Casacuberta E, Sudek L, (...), **Turnšek J**, (...), Lukeš J. 2020. Genetic tool development in marine protists: emerging model organisms for experimental cell biology. *Nature Methods* 17:481–494.

Conrado RJ, Wu GC, Boock JT, Xu H, Chen SY, Lebar T, **Turnšek J**, Tomšič N, Avbelj M, Gaber R, Koprivnjak T, Mori J, Glavnik V, Vovk I, Benčina M, Hodnik V, Anderluh G, Dueber JE, Jerala R, DeLisa MP. 2012. DNA-guided assembly of biosynthetic pathways promotes improved catalytic efficiency. *Nucleic Acids Research* 40:1879–1889.

PATENT APPLICATION

Jerala R, Avbelj M, Benčina M, Mori J, Gaber R, Koprivnjak T, Anderluh G, Vovk I, Lebar T, **Turnšek J**, Ilc T, Tomšič N, Stošički T, Žnidarič M, Bordon J, Petroni M, Glavnik V. Improved synthesis of biosynthetic product by ordered assembly of biosynthetic enzymes guided by the nucleotide sequence motif template. WO2012053985 filed on 2010-10-22 and published on 2012-04-26.

PRESENTATIONS

Talks (*Invited)

2023 Materials Research Society Spring Meeting, San Francisco, CA	Apr. 2023
Plant Genome Engineering Symposium, Berkeley, CA	Sep. 2022
Methods for studying phase separation in biology, Dresden, Germany	Feb. 2019
ASCB EMBO 2018 Meeting, San Diego, CA	Dec. 2018
Scripps Institution of Oceanography, La Jolla, CA	Nov. 2017
Wyss Institute for Biologically Inspired Engineering, Boston, MA	Mar. 2016
4 th ISS: International Summer School, Piran, Slovenia*	Aug. 2011

6 th CeBiTec Symposium: Genome-based Microbiology, Bielefeld, Germany*	July 2011
1 st Bio:Fiction, Science, Art and Film Festival, Vienna, Austria*	May 2011
iGEM 2010 Jamboree, Cambridge, MA	Nov. 2010

Posters

Plant & Microbial Biology Department Retreat, Berkeley, CA	Sep. 2022
Biomining Gordon Research Seminar and Conference, Castelldefels, Spain	Aug. 2022
Ocean Sciences Meeting 2020, San Diego, CA	Feb. 2020
Phase Transitions in Polymeric and Protein Systems, Dresden, Germany	Feb. 2019
ASCB EMBO 2018 Meeting, San Diego, CA	Dec. 2018
ASM Microbe 2018, Atlanta, GA	June 2018
A New Age of Discovery for Aquatic Microeukaryotes, Heidelberg, Germany	Jan. 2016
The Eleventh Annual Broad Institute Retreat, Boston, MA	Dec. 2015
Wyss Institute 7th Annual Retreat, Boston, MA	Nov. 2015
Molecular Life of Diatoms 2015, Seattle, WA	July 2015

TEACHING AND MENTORING

Research Mentor , UC Berkeley, Berkeley, CA	Sep. 2022–present
Training two undergraduates to perform molecular cloning, genetically engineer diatoms, and conduct fluorescence microscopy experiments.	
Guest Lecturer , UC Berkeley, Berkeley, CA	Feb. 2022
Lectured on diatom biology in the Biology of Algae (PMB 120) course.	
Research Mentor , J. Craig Venter Institute, La Jolla, CA	Apr. 2017–Sept. 2018
Trained a Research Associate to perform molecular cloning, genetically engineer diatoms, and conduct fluorescence microscopy and proximity labeling experiments.	
Biochemistry Bootcamp Mentor , Wellesley College, Wellesley, MA	Jan. 2015
Guided two undergraduates through protein expression, purification, and activity experiments.	
Mathematics, Physics, and English Tutor	2006–2008
Conducted High School level Mathematics, Physics, and English tutoring in Slovenia.	

SERVICE AND OUTREACH

SERVICE

Proposal Reviewer	Nov. 2023
Homeworld Collective Garden Grants, San Francisco, CA	
Discussion Leader	Aug. 2022
Biomining Gordon Research Seminar, Castelldefels, Spain	
Ambassador	Nov. 2017–Sept. 2020
protocols.io, Berkeley, CA	
Pre-Proposal Reviewer	Aug.–Sept. 2019
Symbiosis in Aquatic Systems Initiative by the Gordon and Betty Moore Foundation, Palo Alto, CA	

OUTREACH

Ocean Lights: bioluminescent bloom information booth, La Jolla, CA	May 2018
Turnšek J. 2018. Marine Microbes: Triathlete's Best Friends. <i>Triathlon Club of San Diego newsletter</i> Jan./Feb. 2018:1 & 6.	Feb. 2018
TriForOceans: saving coral reefs through triathlon, Gilford, NH	Aug. 2016
Turnšek J. Going with the Flow: New Evidence for Liquid Water on Mars.	Oct. 2015
Turnšek J. Diatoms: Nature's nanotechnologists.	May 2014
Turnšek J. 2013. Slovenian success in the biomolecular design competition BIOMOD 2011 <i>Proteus</i> 75:347–352. (Kavčič Award)	Apr. 2013

Jerala R, Gaber R, Mori J, **Turnšek J**. 2012. Synthetic Biology: from Nanoscale to the Molecular Assembly Line. *Quark, Research and Development in Slovenia* Summer 2012:20–23. July 2012

PROFESSIONAL EXPERIENCE

HHMI Postdoctoral Associate Department of Plant and Microbial Biology, UC Berkeley, Berkeley, CA <i>Advisor: Krishna K. Niyogi, PhD</i>	July 2020–present
Postdoctoral Researcher Microbial and Environmental Genomics, J. Craig Venter Institute, La Jolla, CA <i>Advisor: Andrew E. Allen, PhD</i>	Jan. 2020–May 2020
Research Fellow Microbial and Environmental Genomics, J. Craig Venter Institute, La Jolla, CA <i>Advisor: Andrew E. Allen, PhD</i>	Sept. 2016–Dec. 2019
Visiting Graduate Student Scripps Institution of Oceanography, UC San Diego, La Jolla, CA Center for Research in Biological Systems, UC San Diego, La Jolla, CA <i>Advisor: Andrew E. Allen, PhD</i>	Sept. 2016–May 2019
Graduate Research Fellow Department of Systems Biology, Harvard Medical School, Boston, MA <i>Advisor: Pamela A. Silver, PhD</i>	May 2014–Dec. 2019
Organism Engineer Ginkgo Bioworks, Inc., Boston, MA <i>Advisor: Curt Fischer, PhD</i>	Oct. 2012–June 2013
Expert Associate National Institute of Chemistry, Ljubljana, Slovenia <i>Advisor: Roman Jerala, PhD</i>	Aug. 2011–July 2012

PROFESSIONAL DEVELOPMENT

Academic Lab Management & Leadership Symposium Torrey Pines Training Consortium, San Diego, CA	Mar. 2023
Scientific Leadership and Management Skills Course UC Berkeley, Berkeley, CA	Feb. 2023
EMBO Practical Course: Methods for studying phase separation in biology Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany	Feb. 2019
ASCB and Keck Graduate Institute Biotech Mini-Course Biocom, San Diego, CA	Dec. 2018
Microbial Sciences Initiative Microscopy Short Course Harvard University, Cambridge, MA	Jan. 2016
Material Research Society Science Writing Workshop Hynes Convention Center, Boston, MA	Nov. 2015
Discover Management Program IEDC - Bled School of Management, Bled, Slovenia	July 2011
Regional BioCamp LEK - a Sandoz Company, Ljubljana, Slovenia	May 2011

SKILLS

Wet Lab

Molecular cloning • CRISPR • Bacterial, yeast, diatom genetic engineering • gDNA and RNA extraction • cDNA synthesis • Fluorescence microscopy • Electron microscopy • Proximity labeling • Pull-down assays • Yeast two-hybrid • Protein purification • PAGE • Western blot

Dry Lab

Benchling • SnapGene • Geneious • Chimera • Basic knowledge of Bash, R, Python, and LaTeX

Languages

Slovenian and English (Native or Bilingual Proficiency) • Bosnian-Croatian-Montenegrin-Serbian (Limited Working Proficiency) • German and Spanish (Elementary Proficiency)

HONORS AND AWARDS

Kavčič Award for Popular Science Writing, Ljubljana, Slovenia	Apr. 2013
University of Ljubljana Prešeren Award for MSc Thesis, Ljubljana, Slovenia	Nov. 2012
Krka Prize for MSc Thesis, Novo mesto, Slovenia	Oct. 2012
University of Ljubljana Rector's Best Innovation Award, Ljubljana, Slovenia	Dec. 2011
Gold Medal, BIOMOD 2011, Boston, MA	Nov. 2011
Grand Prize, iGEM 2010, Cambridge, MA	Nov. 2010
Zois Scholarship, Ljubljana, Slovenia	2002–2011

HOBBIES AND INTERESTS

Endurance Sports

USA Triathlon Olympic-Distance Age Group National Championships qualifier.	2018, 2019, 2022
Two-time marathon and four-time Half Ironman triathlon finisher.	2013–present

Basketball

Harvard Medical School intramural basketball league champion.	2014
Two-time University of Ljubljana basketball league champion.	2008, 2009
Played semi-professionally for three Slovenian teams.	2007–2010

Interests

Space exploration • Mathematics • Exercise physiology • Sports performance technology • Traveling • Coffee culture

ACADEMIC REFERENCES

Krishna K. Niyogi, PhD

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Professor, Department of Plant and Microbial Biology, UC Berkeley
Faculty Scientist, Lawrence Berkeley National Laboratory
Investigator, Howard Hughes Medical Institute

Andrew E. Allen, PhD

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Professor, Environmental Sustainability, Synthetic Biology, J. Craig Venter Institute
Professor, Scripps Institution of Oceanography, UC San Diego

Christopher L. Dupont, PhD

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Professor, Environmental Sustainability, Synthetic Biology, Human Health, J. Craig Venter Institute

Sinem Beyhan, PhD

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Associate Professor, Human Health, J. Craig Venter Institute
Adjunct Professor, UC San Diego
Adjunct Professor, San Diego State University