Timothy Stephens
Curriculum vitae

Personal summary

I am a computational biologist working on understanding the forces that govern the interactions between organisms in ecologically critical environments, such as coral reefs, and the forces that drive major evolutionary transitions, such as the one that gave rise to the first photosynthetic Eukaryotas.

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TimothyStephens

Education

2012 — 2015	Bachelor of Biotechnology, Institute for Molecular Bioscience, The University of Queensland
2015 — 2015	Honours, Institute for Molecular Bioscience, The University of Queensland
2016 — 2019	PhD, Institute for Molecular Bioscience, The University of Queensland

Research Experience

2012 — 2013	Undergraduate Research Project, Institute for Molecular Bioscience, The University of Queensland
2013 — 2013	Paid Research Assistant, School of Biological Sciences, The University of Queensland
2014 — 2014	Undergraduate Researcher Project, School of Biological Sciences, The University of Queensland
2015 — 2015	Honours Project, Institute for Molecular Bioscience, The University of Queensland
2016 — 2019	PhD, Institute for Molecular Bioscience, The University of Queensland
2019 — present	Post Doctoral Associate, Department of Biochemistry and Microbiology, Rutgers University

Teaching experience

2012 – 2014 **CASPiE Tutor**
University of Queensland
Duties included guiding undergraduate chemistry students through an advanced set of research-focused practicals, with the aim of developing their critical and experimental thinking.

2013 **Science Mentor**
University of Queensland
Duties included organizing and running first year science student introduction and social engagement events designed to inform students about study/research opportunities available at The University of Queensland.

2013 – 2014 **Peer Assisted Study Session (PASS) Tutor**

University of Queensland
Duties included planning and leading multiple weekly tutorial sessions, each comprising 20-30+ students.

2016 — 2017 Practical Tutor
University of Queensland
Duties included assisting students with the completion of set questions and marking of assignments.

2018 Head Practical Tutor
University of Queensland
Duties included designing and developing assessment material for the course and organising marking of assignments.

2020 — 2022 Guest lecturer
Rutgers University
Conducted lectures on de

novo next-generation sequencing, genome and transcriptome sequencing, and metagenomics in a join undergraduate and postgraduate course titled "Fundamentals of Microbial Genomics". Also assisted in designing and marking student exam questions and students' oral presentations.

Professional development

2017	UQ Idea Hub, University of Queensland
2017	Research Commercialisation Workshop, University of Queensland

Awards and honours

2011	Merit Scholarship for academic achievement, University of Queensland
2012	Selected for the Advanced Study Program in Science (ASPinS; based on academic merit),

University of Queensland	
2012	Dean's Commendation for Academic Excellence (achieved a GPA over 6.6), University of Queensland
2016	Research Training Program (RTP) scholarship, University of Queensland
2016	Top poster prize at the IMB Research Higher Degree Student Symposium, University of Queensland
2017	Won best pitch prize at the UQ Idea Hub, University of Queensland
2018	Registration award for Society for Molecular Biology & Evolution (SMBE) 2018, SMBE
2021	2019 Dean's Award for Outstanding Higher Degree by Research Theses, University of Queensland

Publications

2022 Davies S. W., Gamache M. H., Howe-Kerr L., Kriefall N.G., Baker A.C., Banaszak A., Bay L., Bellantuono A.J., Chan C. X., Claar D.C., Coffroth M.A., Cunning R., del Campo J., Frommlet J. C., Fuess L. E., Goulet T. L.,Hoadley K. D., Hume B. C. C., Kemp D. W., Kitchen S. A., LaJeunesse T. C., Lin S., McIlroy S., McMinds R., Nitschke M. R., Oakley C. A., Peixoto R. S., Prada C., Putnam H. M., Quigley K., Reich H. G., Reimer J. D., Rosales S., Saad O. S., Santos S. R., Shoguchi E., **Stephens T. G.**, Strader M. E., Suggett D. J., Swain T. D., Tran C., Traylor-Knowles N., Voolstra C. R., Weis V., Wright R., Yamashita H., Ziegler M., Correa A. M. S., and Parkinson J. E. Building consensus around the assessment and interpretation of

symbiodiniaceae diversity. *Under review in PeerJ*, 2022. [Preprint]

2022 Bhattacharya D., Etten J. V., Benites L. F., and **Stephens T. G.** Endosymbiotic ratchet accelerates divergence after organelle origin. *Under review in BioEssays*, 2022.

2022 Meng Z., Williams A., Liau P., **Stephens T. G.**, Drury C., Chiles E. N., Su X., Javanmard M., and Bhattacharya D. Development of a portable toolkit to diagnose coral thermal stress. *Scientific Reports*, 12:14398, 2022. [URL]

2022 Benites L. F., **Stephens T. G.**, and Bhattacharya D. Multiple waves of viral invasions in Symbiodiniaceae algal genomes. *Accepted for publication in Virus Evolution*, 2022. [Preprint]

2022 *Gabr A., ***Stephens T. G.**, and Bhattacharya D. Loss of key endosymbiont genes may facilitate early host control of the chromatophore in *Paulinella*. *iScience*,

25:104974, 2022. [URL] *Co-first authorship

2022 **Stephens T. G.**, Lee J., Jeong Y., Yoon H. S., Putnam H. M., Majerova E., and Bhattacharya D. High-quality genome assembles from key Hawaiian coral species. *Accepted for publication in GigaScience*, 2022.

2022 Bhattacharya D., **Stephens T. G.**, Tinoco A., Richmond R., and Cleves P. A. Life on the edge: Hawaiian model for coral evolution. *Limnology and Oceanography*, 67:1976-1985, 2022. [URL]

2022 *Calatreva V., ***Stephens T. G.**, Gabr A., Grossman A. R., and Bhattacharya D. Retrotransposition facilitated the establishment of a primary plastid in the thecate amoeba *Paulinella*. *PNAS*, 119:e2121241119, 2022. [URL] *Co-first authorship

2022 *Gabr A., ***Stephens T. G.**, and Bhattacharya

D. Hypothesis: *Trans*-splicing generates evolutionary novelty in the photosynthetic amoeba *Paulinella*. *Journal of Phycology*, 58:392-405, 2022. [URL] *Co-first authorship

2022 Dougan K. E., Gonzalez-Pech R. A., **Stephens T. G.**, Shah S., Chen Y., Ragan M. A., Bhattacharya D., and Chan C. X. Genome-powered classification of microbial eukaryotes: focus on coral algal symbionts. *Trends in Microbiology*, 30:831-840, 2022. [URL]

2022 Gabr A., Zournas A., **Stephens T. G.**, Dismukes G., and Bhattacharya D. Evidence for a robust photosystem II in the photosynthetic amoeba *Paulinella*. *New Phytologist*, 234:934-945, 2022. [URL]

2021 **Stephens T. G.**, Gabr A., Calatreva V., Grossman A. R., and Bhattacharya

D. Why is primary endosymbiosis so rare?. *New Phytologist*, 231:1693-1699, 2021. [URL]

2021 Bernard G., **Stephens T. G.**, Gonzalez-Pech R. A., and Chan C. X. Inferring phylogenomic relationship of microbes using scalable alignment-free methods. *Methods in Molecular Biology*, 2242:69-76, 2021. [URL]

2021 Jacobus A. P., **Stephens T. G.**, Youssef P., Gonzalez-Pech R., Ciccotosto-Camp M. M., Dougan K. E., Chen Y., Basso L. C., Frazzon J., Chan C. X., and Gross J. Comparative genomics supports that Brazilian bioethanol *Saccharomyces cerevisiae* comprise a unified group of domesticated strains related to cacha<U+008D>a spirit yeasts. *Frontiers in Microbiology*, 12:644089, 2021. [Preprint] [URL]

2021 Gonzalez-Pech,

R. A., **Stephens T. G.**, Chen Y., Mohamed A. R., Cheng Y., Shah S., Dougan K. E., Fortuin M. D. A., Lagorce R., Burt D. W., Bhattacharya D., Ragan M. A., and Chan C. X. Comparison of 15 dinoflagellate genomes reveals extensive sequence and structural divergence in family Symbiodiniaceae and genus *Symbiodinium*. *BMC Biology*, 19:73, 2021. [Preprint] [URL]

2021 Williams A., Pathmanathan J. S., **Stephens T. G.**, Su X., Chiles E. N., Conetta D., Putnam H. M., and Bhattacharya D. Multi-omic characterization of the thermal stress phenome in the stony coral *Montipora capitata*. *PeerJ*, 9:e12335, 2021. [Preprint] [URL]

2020 Lhee D., Lee J., Ettahi K., Cho C. H., Ha J., Chan Y., Zelzion U., **Stephens T. G.**, Price D. C.,

Gabr A., Nowack E. C. M., Bhattacharya D., and Yoon H. S. Amoeba genome reveals dominant host contribution to plastid endosymbiosis. *Molecular Biology and Evolution*, 38:344-357, 2020. [URL]

2020 **Stephens T. G.**, Gonzalez-Pech R. A., Cheng Y., Mohamed A. R., Burt D. W., Bhattacharya D., Ragan M. A., and Chan C. X. Genomes of the dinoflagellate *Polarella glacialis* encode tandemly repeated single-exon genes with adaptive functions. *BMC Biology*, 18:56, 2020. [Preprint] [URL] Featured by IMB News

2019 Chen Y., Gonzalez-Pech R. A., **Stephens T. G.**, Bhattacharya D., and Chan C. X. Evidence that

inconsistent gene prediction can mislead analysis of dinoflagellate genomes. *Journal of Phycology*, 56:6-10, 2019. [Preprint] [URL]

2018 Liu H., **Stephens T. G.**, Gonzalez-Pech R. A., Beltran V. H., Lapeyre B., Bongaerts P., Cooke I., Aranda M., Bourne D. G., Foret S., Miller D. J., van Oppen M. J. H., Voolstra C. R., Ragan M.A., and Chan C.X. *Symbiodinium* genomes reveal adaptive evolution of functions related to coral-dinoflagellate symbiosis. *Communications Biology*, 1:95, 2018. [Preprint] [URL] Featured by multiple outlets: IMB News, GBRF, Video Feature, IMB 2018 year in review video

2018 Lee J, Yang E. C., Graf L.,

Yang J. H., Qiu H., Zelzion U., Chan C. X., **Stephens T. G.**, Weber A. P. M., Boo G. H., Boo S. M., Kim K. M., Shin Y., Jung M., Lee S. J., Yim H. S., Lee J. Y., Bhattacharya D., and Yoon H. S. Analysis of the draft genome of the red seaweed *Gracilariopsis chorda* provides insights into genome size evolution in Rhodophyta. *Molecular Biology and Evolution*, 35:1869-1886, 2018. [URL]

2018 *Gonzalez-Pech R. A., ***Stephens T. G.**, and Chan C. X. Commonly misunderstood parameters of NCBI BLAST and important considerations for users. *Bioinformatics*, 35:2697-6998, 2018. [URL] *Co-first authorship

[F1000 recommended]

2018 **Stephens T. G.**, Ragan M. A., Bhattacharya D., and Chan C. X. Core genes in diverse dinoflagellate lineages include a wealth of conserved dark genes with unknown functions. *Scientific Reports*, 8:17175, 2018. [URL]

2016 **Stephens T. G.**, Bhattacharya D., Ragan M. A., and Chan C. X. PhySortR: a fast, flexible tool for sorting phylogenetic trees in R. *PeerJ*, 4:e2038, 2016. [Preprint] [URL]

Talks

2017 **Stephens T. G.**, Bhattacharya D., Ragan M. A. and Chan C. X. Insights into coral reef symbiosis from the genome of cold-adapted algae. *EMBL Australia Postgraduate Symposium 2017*, 29th November-1st December 2017, Sydney, Australia.

2018 **Stephens T. G.**, Bhattacharya D., Ragan M. A., and Chan C. X. *Polarella* genomics: understanding the evolutionary transition to algal symbiosis and cold adaptation. *Botany Department, Biosciences Institute, University of Sao Paulo*. 14th December 2018, Sao Paulo, Brazil.

2018 **Stephens T. G.**, Bhattacharya D., Ragan M. A., and Chan C. X. *Polarella* genomics:

understanding the evolutionary transition to algal symbiosis and cold adaptation. *2nd Bioenergy Workshop, UNESP-USP-UNICAMP Integrated Postgraduate Program in Bioenergy, Institute for Research in Bioenergy, State University of Sao Paulo (UNESP)*. 6th December 2018, Sao Paulo, Brazil.

2019 **Stephens T. G.**, Bhattacharya D., Ragan M. A., and Chan C. X. *Polarella* genomics: understanding the evolutionary transition to algal symbiosis and cold adaptation. *Joint Academic Microbiology Seminars (JAMS)*. 9th April 2019, Brisbane, Australia.

2021 **Stephens T. G.**, Calatrava V., Gabr A., Grossman A., and Bhattacharya D. Insights into the evolution of a primary

endosymbiosis through analysis of the *Paulinella* genome. *12th International Phycological Congress*. 22-26th March 2021, Chile.

2021 **Stephens T. G.**, Calatrava V., Gabr A., Grossman A., and Bhattacharya D. Insights into the evolution of a primary endosymbiosis through analysis of the *Paulinella* genome. *75th Annual Meeting of the Phycological Society of America*. 13-22nd July 2021, online.

2022 **Stephens T. G.**, Etten J. V., McDermott T., and Bhattacharya D. Analysis of environmental meta-omics data from the extremophilic red algae Cyanidiophyceae. *Joint Aquatic Sciences Meeting*. 14-20th May, 2022, Grand Rapids, USA.

2022 **Stephens T. G.**, Strand E. L., Putnam H. M., and Bhattacharya D. Differences in ploidy and the prevalence of clonal

propagation between *Montipora capitata* and *Pocillopora acuta* from Kane'ohe Bay, Hawai'i. *15th International Coral Reef Symposium*. 3-8th July 2022, Bremen, Germany.

Poster presentations

2018 **Stephens T. G.**, Bhattacharya D., Ragan M. A., and Chan C. X. *Polarella* genomics: understanding cold adaptation and evolutionary transition to symbiosis in dinoflagellates. *Society for Molecular Biology & Evolution (SMBE) annual meeting 2018*, 8-12th July 2018, Yokohama, Japan.

2016 **Stephens T. G.**, Chan C. X., and Ragan M. *Polarella* genomics: understanding the

evolutionary transition to algal symbiosis and cold adaptation, *IMB Research Higher Degree Student Symposium*, 13th Jul 2016, The University of Queensland, Brisbane, Australia.

Grants

2018 UQ-FAPESP Strategic Research Fund SPRINT (2018/15159-9), $20,000 (~USD $14,000)
Integrated genomic approaches to understand stress tolerance in bioethanol-producing yeasts and coral reef symbionts
Principal Investigators: Cheong Xin Chan (UQ) and Jeferson Gross (State University of Sao Paulo), Jointly funded by University of Queensland (UQ) and Sao Paulo State Foundation (FAPESP)

2022 Core Facility Utilization Application, $5,000 USD
Funds for sequencing of coral microbiome samples.
Principal Investigators: Debashish Bhattacharya (Rutgers University), Rutgers University

2022 Center for Nutrition, Microbiome, and Health Small Grant FY-22, $2,000 USD
Characterizing the coral microbiome biogeography across colonies and reefs.
Principal Investigators: Debashish Bhattacharya (Rutgers University), Center for Nutrition, Rutgers University

Media coverage

2020 Our paper Amoeba Genome Reveals Dominant Host Contribution to Plastid Endosymbiosis covered by Rutgers Today

2021 Our paper Why is primary endosymbiosis so rare? was covered by Rutgers Newsroom. We also produced two animated videos: Video 1, Video 2

2022 Our paper Retrotransposition facilitated the establishment of a primary plastid in the thecate

amoeba *Paulinella* covered by Rutgers Research

2022 Article by Rutgers Research on our short film The Coral Holobiont Response to Climate Change which won Best Trailer in the Kiez Berlin Film Festival.