

DEVAKI BHAYA (JUNE 2019)

PERSONAL INFORMATION

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POSITIONS

Program Director, Systems and Synthetic Biology, Molecular and Cellular Biosciences, at the National Science Foundation, Alexandria, VA (Sept 2016-December 2018; 50% from January 2019)

Research Staff Scientist, Carnegie Institution for Science, Department of Plant Biology, 260 Panama Street, Stanford, CA 94305 (2001-Current)

Courtesy Professor, Department of Biology, Stanford University (2015-Current)

Courtesy Faculty, Center for Evolutionary and Human Genomics, Stanford University (Current)

Research Fellow, Carnegie Institution for Science, Department of Plant Biology, 260 Panama Street, Stanford, CA 94305 (1995-2001)

Associate Professor, Center for Biotechnology, Nehru University, Delhi, India (1991-1995)

Rockefeller Foundation Fellow, Carnegie Institution, Stanford, CA 94305 (Summer 1988-1990)

Assistant Professor, Founding faculty at Center for Biotechnology, Nehru University, New Delhi, India (1986-1990)

Postdoctoral Fellow, (with Paul Castelfranco), University of California (1983-1985)

Ph.D., (with André Jagendorf), Department of Plant Biology, Cornell University (1979-1983)

HONORS, SERVICES, FELLOWSHIPS

2019 Teaching at EMBO workshop, Heidelberg.

2018 ELECTED AS Fellow of the California Academy of Sciences, San Francisco

2019, 2018 Teaching at SCELSE, Summer school, Nanyang Technical University, Singapore

2018 International Scientific Committee (ISC) of the International Symposium on Phototrophic Prokaryotes (ISPP), Vancouver, Canada.

2018 External co-organizer of the first "Symposium on Viral EcoGenomics and Applications" at the DOE-Joint Genome Institution, Walnut Creek.

2016-2018 Program Director, Systems and Synthetic Biology cluster, Division of Molecular and Cellular Biosciences at the National Science Foundation

2017 Co-organizer of Environmental Microbiomes (with K. Peay, A. Grossman and A. Bhatt), Bioinformatics Symposium at Stanford University, September, 2017

2016-2019 Steering Committee, NSF Research Coordination Network project, PlanNet, <http://plannet-rcn.org/about/>

2016 Selection committee for the CEHG Fellowships

2016-2018 Selection committee for the Paul & Daisy Soros Fellowships for New Americans

2016 NASA Panel for Planetary Science and Technology through Analog Research: panelist

2014-2017 Editorial Board "New Negatives in Plant Sciences", Elsevier

2014 Adviser, Silicon Valley Space Center's (SVSC) Business Advisory Board (NASA)

2014 Organizer, US-UK Joint Nitrogen Ideas lab Kickoff meeting (NSF-BBSRC), San Francisco

2014 Appointed Courtesy Faculty at the Center for Evolutionary Genomics, Stanford

2013-2014 Editor, Special volume "Cyanobacteria and Photosynthesis", in 'Photosynthesis Research'

2013 Co-organizer, Symposium in honor of Winslow Briggs, November 2013

2012 Chapter for "Photobiology Online" on Photoperception in Cyanobacteria (with A. Grossman)

2011 ongoing Associate Editor "Frontiers in Aquatic Microbiology"

2010 Advisory Committee "Optogenetics Innovation Laboratory" at BioX, Stanford University

2010 External reviewer for Huang Lab, Dept. of Bioengineering, Stanford University

2010 Advisory Board of Metacyc database, SRI Menlo Park

2009-2011 Member, Sophomore Mentoring Program, Stanford University
2009 Contributor to the World Science Festival, Lincoln Center, NYC.
2009 Advisor to the School of Biological Sciences, Indian Institute of Technology Delhi, India.
2009 NASA Exobiology, 2008 Panel meeting member
2008 Organizer at NASA workshop, Ames “Cyanobacteria in the Lunar Environment”
2008 Organizer Briggs symposium with Arthur Grossman and Zhiyong Wang
2004-2008 NSF-FIBR workshop co-organizer, “Do species matter in microbial communities?”
2006 Guest Editor for Annual Reviews of Plant Biology
2004-2010 ASM Minority Mentoring Program
2004-2005 Frontiers in Integrative Biology, NSF panel meeting
2004-2005 Organizer Seminar series at the Carnegie Institution
2000 -2001 Consultant to Exelixis Inc., South San Francisco
2000-2001 Board of Directors, Children’s Center of the Stanford Community
1988-1990 Rockefeller Biotechnology Career Fellowship
1988 Award from the Botanical Society of India, Ranked first in the Graduating class.
1987 Young Scientist Fellowship, Department of Science and Technology (India)
1980-1981 Knudson Graduate Fellowship, Cornell University
1979-1980 Sage Graduate Fellowship, Cornell University
1977 Gold medal winner, Ranked First in the First Class, B.Sc. (Botany), University of Calcutta
1974-1977 National Talent Science Fellowship, India

REVIEWER (ONGOING) for several journals including Journal of the Royal Society, London, Applied Environmental Microbiology, Environmental Microbiology, Geobiology, ISME Journal, J. Bacteriology, Molecular Microbiology, Molecular Plant, Microbiology, Plant Cell, Plant Physiology, Proceeding of the National Academy of Sciences, USA, PLoS Biology, Science.

CURRENT & RECENT FUNDING

- **'Cyanophages and Cyanobacteria in Extreme Environments'** JGI Community Science Program (no direct funding but JGI will cover all sequencing costs and basic analysis)
- **“Nitroplast: a synthetic nitrogen fixing organelle”**, 2013-2018, NSF/BBSRC “Improving on Nature”
- **“Building Genetic Tools to Engineer Cyanobacteria”**, 2012-2014, Stanford BIOX Interdisciplinary Initiatives Program (with Jim Swartz & Julie Theriot, Bioengineering, Stanford)
- **“Precise design of synthetic multicellular communities using optical control”**, 2011-2013, Stanford BIOX Interdisciplinary Initiatives Program (with KC Huang, Bioengineering, Stanford)
- **“Measuring whole gene expression, cell by cell: bistability in *Vibrio cholerae*”**, 2010-2011, NIH/ARRA project (with Gary Schoolnik, Stanford School of Medicine)
- **“Optically controlled, spatially structured, motile community using cyanobacteria”**, 2010-2011, NAFKI seed grant from the Keck Foundation (with K.C Huang, Bioengineering, Stanford University)
- **“Novel Aspects of Phosphorus Metabolism in Thermophilic Cyanobacteria”**, 2010-2014, National Science Foundation, Molecular and Cellular Biosciences Division
- **“Do species matter in Microbial communities?”**, 2004-2010, National Science Foundation, Frontiers in Integrative Biology (co-PI)
- **“Social Dynamics, Signaling, and Surface Motility in Cyanobacteria: Integrating Models and Experiments”**, 2008-2013 (with Doron Levy, Dept. of Mathematics, University of Maryland) Joint DMS, NSF/NIGMS Solicitation on Mathematical Biology)
- **"Quantitating Low-Copy-Number Proteins in Individual Cells Using Microfluidics and Single Molecule Counting,"** 2006-2008 SGER-National Science Foundation (with Richard Zare, Department of Chemistry, Stanford University)

ROLE AT NATIONAL SCIENCE FOUNDATION:

At the National Science Foundation: I joined NSF in September 2016, and represented NSF at several meetings and have given several presentations at conferences and workshops about the major areas of

interest to NSF in the area of Synthetic Biology. I have been on review panels for DARPA, ONR, DOE etc. I have also been a member of working groups to promote interdisciplinary research across Directorates as part of a new initiative at NSF called the “Rules of Life”.

SELECTED INVITED SEMINARS/TALKS (2015-2019)

2019

- March, 2019 Invited seminar at American Physical Society, Boston, MA
- May, 2019 Invited seminar, Danforth Center, St. Louis, MI
- July, 2018, invited seminar, Plant Research Labs, Michigan State University
- September, 2019, *Synthetic Biology in action: filling the gap between the natural and the non-natural* to take place in the EMBL, Heidelberg, Germany.

2018

- December, Revolutionizing Agriculture with Synthetic Biology, Banbury Center, Cold Spring Harbor Laboratory.
- November, 2018 International Workshop on the Bioeconomy, Ottawa Canada (NSF representative)
- November, 2018 Attended Microbiome Engineering Workshop, Boston MA
- July, 2018, Mammalian Synthetic Biology workshop, Panel Discussion. Boston MA
- June, 2018 Aspen Institution for Physics, Microbiome Workshop
- August, 2018 Plenary talk at “International photosynthetic Prokaryotes, Vancouver, Canada
- March 2018, Invited talk, University of Geneva
- March, 2018, Invited talk, Photosensory Receptors, Gordon Research Conference in Tuscany
- February, 2018 Oklahoma State University

2017

- December, 2017 City University of New York, Graduate Center
- November, 2017 Plenary talk 11th Georgia Tech International Conference in Bioinformatics, Metagenomics and Microbiomes"
- November, 2017 Invited seminar Jawaharlal Nehru University
- October 2017, Plenary Talk, Bose Institute, Kolkata, 100th anniversary celebrations
- July, 2017, Invited talk, Plant Metabolic Engineering, Gordon Conference
- July, 2017, Invited talk, Photosynthesis, Gordon Conference
- May, 2017, Invited talk, Department of Embryology, Carnegie Institution for Science
- April, 2017, IMET, University of Maryland, Invited talk

2016

- December, 2016, Keynote talk, 26th Western Photosynthesis Conference, Marconi Center
- June 2016, Invited talk at First Systems Biology Retreat, Stanford
- May 2016, Plenary talk, 12th Workshop on Cyanobacteria, Arizona State University
- April 2016, Invited speaker in the Stanford Earth System Science Seminar Series

2015

- December 2015, Speaker at Science and Technology series, Joint Genome Center, DOE
- October 2015, Speaker at ‘Origins of Life’ workshop, Carnegie Institution, Washington DC
- October 2015, Invited speaker at 19th International Meeting on Nitrogen Fixation, Asilomar
- September 2015, Tackling the Nitrogen Crisis, Symposium at Oxford University
- September 2015, Midway meeting/workshop, co-sponsored by NSF-BBSRC, London
- June 2015, Invited speaker, Gordon Research conference on Photosynthesis.
- April 2015, Invited speaker, “Genetics and Society Symposium”, CEHG, Stanford.
- January 2015, invited speaker, 24th Western Photosynthesis Conference, Asilomar. CA

TEACHING

- 2015 (Winter quarter) “Party with Trees” Freshman seminar designed to explore trees at Stanford using modern technologies and insights.

- 2011-2014 Freshman Advisor at Stanford University (currently advisor to five freshmen)
- 2007-2013 Hopkins Microbiology Microbial Diversity course at the Hopkins Marine Station, Stanford University, organized by Alfred Spormann and Chris Francis
- 2010 “Facebug: the social life of microbes” Introductory Freshman seminar course to explore genomic tools in the context of microbial diversity in the environment
- 2008, “Microbes, Mysteries and Metagenomics” 3 credit Introductory Freshman seminar course to introduce the uses of genomics and metagenomics to probe microbial diversity.
- 2008-2016 Invited lectures in Geomicrobiology class, taught by Chris Francis, Department of Environmental Earth System Science, Stanford
- 2004-2006 “Lights, Pigments, Organisms” (with Richard Zare and Arthur Grossman) 3 credit laboratory and lecture course: concepts of photosynthesis and fluorescence
- 1986-1995 Taught and developed several graduate level courses (Microbiology and Molecular Biology, lab and lectures) at the Center for Biotechnology, Nehru University, Delhi India

POSTDOCTORAL FELLOWS

- Dr. Rick Kim, current
- Dr. Michelle Davison, moved to Senior Scientist position, at GAULT, South San Francisco; currently at PNNL
- Dr. Haojie Jin, current
- Dr. Anchal Chandra, moved to Wellcome Burroughs fellow, Cambridge, U.K.
- Dr. Megan Bergkessel, moved to Diane Newman lab, Caltech, CA
- Dr. Susanne Wisen, CA.
- Dr. Rosario Gomez, moved to Faculty, Loyola University, Spain
- Dr. Claire Simpson, New Zealand
- Dr. Oliver Kilian, moved to Senior scientist, Aurora Biofuels, CA
- Dr. Anne Soisig Steunou, Faculty, CNRS, Paris France
- Dr. Wing On (Jacky) Ng, moved to Relman Lab, Stanford

STUDENTS

- Michelle Davison (2013) Ph.D. Biology, Stanford University
- Emma Sedivy, (June 2012) Honors thesis, Biology, Stanford University, ***Firestone Award for Excellence in Undergraduate Research***
- Sheetal Gosrani (May 2012) Master’s thesis Computer Sciences, San Jose State University. Now at Apple Computers
- Melissa Adams (2009) Master’s thesis, Biology Stanford University, USA. Moved to Harvard PhD program.
- Matthew Burriesci (June 2009) Undergraduate Honors thesis, Biology, Stanford University, ***Firestone Award for Excellence in Undergraduate Research***
- Julianna Ross (Dec 2007) Master’s Thesis, Department of Microbiology & Immunology, Stanford University
- Madhulika Srivastava (2006) Ph.D. National Institute of Immunology, India.

THESIS COMMITTEE /JOINT ADVISORY ROLE

- Linta Reji (Earth Systems, with Chris Francis)
- Sukrit Silas (Systems Biology with Andy Fire)
- Scott Dobbins (Genetics & Biochemistry, Stanford with Julie Theriot)
- Rick Zuzow (Genetics& Biochemistry, Stanford with Julie Theriot)
- Brian Yu (Applied Physics, Stanford with Steve Quake)
- Jessica Lee (Earth Sciences, Stanford with Scott Fendorf and Chris Francis)
- Kunal Mehta (Chemical Engineering, Stanford with Jim Swartz)
- Rosanna Chau (Bioengineering, Stanford with K.C. Huang)

- Michael Rosen (Physics, with Daniel Fisher)
- George Asimenos (Computer Science, Stanford with Serafim Batzoglou)
- Eric Hall (Chemistry with Richard Zare),
- Bo Huang (Chemistry with Richard Zare)

UNDERGRADUATE STUDENTS

Trained over 30 students in the laboratory over the last 15 years; most have gone on to graduate school.

PUBLICATIONS

1. Jin H, Lindblad P, Bhaya D (2019) Building an Inducible T7 RNA Polymerase/T7 Promoter Circuit in *Synechocystis* sp. PCC6803. **ACS Synth Biol.** 19;8(4):655-660.
2. Rosen M, Davison M, Fisher D and Bhaya D (2018) Characterizing fine-scale diversity in thermophilic *Synechococcus* population **PLoS One.** 2018 Nov 14;13(11):e0205396.
3. Jin H, Wang Y, Idoine A, Bhaya D (2018) Construction of a shuttle vector for the model cyanobacterium *Synechocystis* sp. PCC6803 **Frontiers in Microbiol.**;9:1662
4. Silas S, Makarova KS, Shmakov S, Páez-Espino D, Mohr G, Liu Y, Davison M, Roux S, Krishnamurthy SR, Fu BXH, Hansen LL, Wang D, Sullivan MB, Millard A, Clokie MR, Bhaya D, Lambowitz AM, Kyrpides NC, Koonin EV, Fire AZ. (2017) On the Origin of Reverse Transcriptase-Using CRISPR-Cas Systems and Their Hyperdiverse, Enigmatic Spacer Repertoires. **MBio.** 2017 Jul 11;8(4). pii: e00897-17.
5. Chau R, Bhaya D. Huang K C (2017) Emergent phototactic responses of cyanobacteria under complex light regimes. **Mbio**;8(2). pii: e02330-16. (*featured in Commentary section: Kim*)
6. Yu FB, Willis L, Chau RM, Zambon A, Horowitz M, Bhaya D, Huang KC, Quake SR. (2017) Long-term microfluidic tracking of coccoid cyanobacterial cells reveals robust control of division timing. **BMC Biol.**; 15 (1):11.
7. Davison M, Treangen TJ, Koren S, Pop M, Bhaya D. (2016) Diversity in a Polymicrobial Community Revealed by Analysis of Viromes, Endolysins and CRISPR Spacers. **PLoS One.** Sep 9;11(9):e0160574.
8. Silas S, Mohr G, Sidote DJ, Markham LM, Sanchez- Amat A, Bhaya D, Lambowitz AM, Fire AZ (2016) Direct CRISPR spacer acquisition from RNA by a natural reverse-transcriptase-Cas1 fusion protein **Science** 351(6276):4234.
9. Bhaya D. (2016) In the Limelight: Photoreceptors in Cyanobacteria. **MBio.**7(3). pii: e00741-16. (Invited Commentary)
10. Rosen M, Davison M, Fisher D and Bhaya D (2015) A quasi-sexual bacterial population occupying a broad niche **Science** 348(6238):1019-23 (*featured in the "Comments Section": Desai & Walczak*)
11. Chau RM, Ursell T, Wang S, Huang KC, and Bhaya D (2015) Rapid motility bias adaptation during cyanobacterial phototaxis. **Biophys J** doi:10.1016/j.bpj.2015.01.042
12. Davison D. and Bhaya D. (2015): "Creation and analysis of a virome: using CRISPR spacers" in "**CRISPR: Methods and Protocols**" eds Fineran P, Lundgren M and E. Charpentier p 307-316
13. Davison M, Hall E, Zare RN, Bhaya D (2014) Challenges of metagenomics and single-cell genomics approaches for exploring cyanobacterial diversity. **Photosyn Res** Dec 17
14. Gomez R, Fazeli F and Bhaya D (2013) The role of polyphosphate accumulation in *Synechococcus* sp. **J. Bacteriol.** 195(15):3309-19
15. Ursell T, Chau R, Wisen S, Bhaya D, Huang KC (2013) Motility enhancement through surface modification is sufficient for cyanobacterial community organization during phototaxis **PLoS Comp. Biol** 9(9): e1003205
16. Nelson W, Bhaya D, and Heidelberg J (2012) Novel miniature transposable elements in thermophilic *Synechococcus* and their impact on an environmental population. **J Bacteriol** 194 (14):3636-42
17. Galante A, Wisen S, Bhaya D, Levy D (2012) Modeling local Interactions during the motion of Cyanobacteria. **J Theor Biol** 309:147-58.
18. Bhaya D, Davison, M. and Barrangou R (2011) CRISPR/Cas systems in bacteria and archaea: versatile small RNAs for defense and regulation **Annual Rev Genet** 45:273-97

19. Klatt CJ, Wood JM, Rusch DB, Bateson MM, Hamamura N, Heidelberg JF, Grossman AR, [Bhaya D](#), Cohan FM, Kühl M, Bryant D, and Ward, DM (2011) Community Ecology of Hot Spring Cyanobacterial Mats: Predominant Populations and their Functional Potential **ISME J** 5(8):1262-78
20. Nelson W., Wollerman L, [Bhaya D](#), and Heidelberg J (2011) Surviving high insertion sequence abundances in populations of thermophilic cyanobacteria **Appl Environ Microbiol** 77 (15):5458-66
21. Chueh B, Li C, Wu, H, Davison M, Wei H, [Bhaya D](#), Zare RN (2011) An Integrated microfluidic Device for whole gene amplification and protein separation from a small number of cyanobacterial cells **Anal Biochem** 411 (1):64-70
22. Gomez-Garcia MR, M. Davison, Hartnung MB, Grossman AR, [D Bhaya](#) (2011) Alternative Pathways for Phosphonate Metabolism in Thermophilic Cyanobacteria from Microbial Mats **ISME J** 5(1):141-9
23. Jensen S, Steunou, A-S, [Bhaya D](#), Kühl M, Grossman AR (2011) *In situ* Dynamics of O₂, pH and cyanobacterial transcripts associated with inorganic carbon concentration, photosynthesis and detoxification of reactive oxygen species in hot spring microbial mats **ISME J** 5(2):317-28
24. Heidelberg JF, Nelson WC, Schoenfeld T and [Bhaya D](#) (2009) Germ warfare in a microbial mat community: CRISPRs provide insights into the co-evolution of host and viral genomes. **PLoS ONE** 4(1):e4169 [Commentary in Faculty of 1000 Biology](#)
25. Adams M, Gomez R, Grossman AR and [D. Bhaya](#) (2008) Responses of thermophilic *Synechococcus* sp. to phosphate deprivation and growth on phosphonate. **J Bacteriol** 190 (24):8171-84
26. Ulijasz AT, Cornilescu G, von Stetten D, Kaminsky S, Mroginski MA, Zhang J, [Bhaya D](#), Hildebrandt P, and Vierstra RD (2008) Characterization of two thermostable cyanobacterial phytochromes reveal global movements in the chromophore-binding domain during photoconversion. **J Biol Chem** 283(30):21251-66
27. Burriesci M and [Bhaya D](#) (2008) Tracking phototactic responses and modeling motility of *Synechocystis* sp. strain PCC6803 **J Photochem Photobiol** 91(2-3):77-86
28. Steunou A-S, Jensen S, Brecht E, Becraft ED, Bateson M, Kilian O, [Bhaya D](#), Ward DM, Peters JW, Grossman AR, Kühl M (2008) Regulation of *nif* Gene Expression and the Energetics of N₂ Fixation over the Diel Cycle in a Hot Spring Microbial Mat **ISME J** 2(4):364-78
29. Kilian O, Steunou A-S, Grossman AR, [Bhaya D](#) (2008) A novel two domain-fusion protein in cyanobacteria with similarity to the CAB/ELIP/HLIP superfamily: Evolutionary implications and regulation **Molecular Plant** 1:155-166
30. [Bhaya D](#), Levy, D, Requeijo, T (2008) Group Dynamics of Phototaxis: Interacting Stochastic Many-Particles Systems and their Continuum Limit, in S. Benzoni-Gavage and D. Serre (Eds.), "Hyperbolic Problems: Theory, Numerics, Applications", **Proceedings of the Eleventh International Conference on Hyperbolic Problems**, Lyon. Springer-Verlag, Berlin, pp.145-159.
31. [Bhaya D](#), Grossman, AR, Steunou AS, Khuri N, Cohan FM, Hamamura N, Melendrez, MC, Bateson M, Ward DM, Heidelberg JF (2007) Genomic, metagenomic and functional analyses of cyanobacteria from hot-spring microbial mats reveal an unexpected diversity in nutrient utilization strategies **ISME J** 1(8):703-13 [Commentary in Faculty of 1000 Biology](#)
32. Kilian O, Steunou A-S, Fazeli F, Bailey S, [Bhaya D](#), Grossman AR (2007) Light Responses of Thermophilic *Synechococcus* isolates from the Microbial Mats of Octopus Spring **Appl Environ Microbiol** 73: 4268-4278
33. Ward DM, Cohan FM, [Bhaya D](#), Heidelberg JF, Kühl M, and Grossman AR (2007) Genomics, Environmental Genomics and the Issue of Microbial Species. **Heredity** 100(2):207-19
34. Huang B, Wu H, [Bhaya D](#), Grossman A R, Granier, S, Kobilka BK and Zare R N (2007) Counting low-copy number proteins in a single cell. **Science** 315: 81-84 [Commentary in Faculty of 1000 Biology](#)
35. Labiosa, RG, Arrigo, KR Tu CJ, [Bhaya D](#), Bay S, Grossman AR, and Shrager J (2006) Examination of diel changes in global transcript accumulation in *Synechocystis* sp. Strain PCC6803: A study in photo-acclimation. **J Phycol** 42:622-636
36. Kapell AD, [Bhaya D](#), van Waasbergen LG (2006) Negative control of the high light-inducible *hliA* gene and implications for the activities of the NblS sensor kinase in the cyanobacterium *Synechococcus elongatus* strain PCC 7942. **Arch Microbiol** 186:403-413

37. [Bhaya D](#), Fazeli F, Nakasugi KN, and Burriesci M, (2006) Phototaxis and impaired motility in adenylyl cyclase and cyclase receptor protein mutants of *Synechocystis* sp. Strain PCC6803 **J Bacteriol** 188: 7306-7610
38. Steunou AS, [Bhaya D](#), Bateson M, Melendrez M, Ward D, Brecht E, Peters JW, Kühl M, Grossman AR (2006) *In situ* analysis of nitrogen fixation and metabolic switching in unicellular thermophilic cyanobacteria inhabiting a hot-spring microbial mat **Proc Natl Acad Sci USA** 103:2398-2407
[Commentary in Faculty of 1000 Biology](#)
39. [Bhaya D](#) (2004) Light matters: Phototaxis and signal transduction in unicellular cyanobacteria **Mol Microbiol.** 53:745-754
40. Ng W-O, Grossman AR and [Bhaya D](#) (2003) Multiple light inputs control phototaxis in *Synechocystis* sp. Strain PCC6803 **J Bacteriol** 185:1599-607
41. [Bhaya D](#), Dufresne A, Vaulot D. and Grossman AR (2002) Analysis of the *hli* gene family in marine and freshwater cyanobacteria **FEMS Microbiol Letters** 215:209-219
42. [Bhaya D](#), Takahashi A, Shahi P, and Grossman AR (2001) Novel motility mutants from *Synechocystis* PCC6803 generated by *in vitro* transposon mutagenesis. **J Bacteriol** 183:6140-6143
43. [Bhaya D](#), Takahashi A and Grossman AR (2001) Light regulation of TypeIV pilus-dependent motility by chemosensor-like elements in *Synechocystis* PCC 6803. **Proc Natl Acad Sci. USA** 98:7540-7545
44. Grossman AR, [Bhaya D](#) and He Q (2001) Tracking the light environment by cyanobacteria and the dynamic nature of light harvesting. **J Biol Chem** 276:11449-52
45. Mrázek J, [Bhaya D](#), Grossman AR and Karlin S (2001) Highly expressed and alien genes of the *Synechocystis* genome. **Nucleic Acids Res** 29:1590-601
46. Huala E, et al. The Arabidopsis Information Resource (TAIR) (2001): A comprehensive database and web-based information retrieval, analysis, and visualization system for a model plant. **Nucleic Acids Res** 29:102-105
47. [Bhaya D](#), Bianco NR, Bryant D and Grossman AR (2000) Type IV pilus biogenesis and motility in the cyanobacterium *Synechocystis* sp. PCC6803. **Mol Microbiol** 37: 941-951
48. [Bhaya D](#), Vaulot D, Amin P, Takahashi AW and Grossman AR (2000) Isolation of regulated genes of the unicellular cyanobacterium *Synechocystis* sp. strain PCC6803 by differential display. **J Bacteriol** 182:5692-5699.
49. [Bhaya D](#). and A.R. Grossman (1999) The role of an alternative sigma factor in motility and pilus formation in the cyanobacterium *Synechocystis* sp. strain PCC6803 **Proc Natl Acad Sci USA** 96: 3188-3193
50. [Bhaya D](#) (1996) Molecular responses of cyanobacteria to nutrient stress. **Journal of Industrial Research** 55: 630-637
51. Grossman, AR, [Bhaya D](#), Apt KE and Kehoe DM (1995) Light harvesting in photosynthetic organisms: Regulation and evolution. **Annual Rev Genet** 29: 231-288
52. Dolganov N, [Bhaya D](#) and Grossman AR (1995) Cyanobacterial protein with homology to the chlorophyll *a/b* binding proteins of plants: Evolution and regulation. **Proc Natl Acad Sci USA** 92: 636-640
53. Srivastava M, [Bhaya D](#), Mohanty P and Bose S (1994) Changes in the antenna size of photosystem I and photosystem II in *Synechococcus* PCC 7942 in the presence of Sandoz 9785, a photosystem II inhibitor. **Photosyn Res** 41: 303-313
54. Apt KE, [Bhaya D](#) and Grossman AR (1994) Characterization of the genes encoding the light-harvesting proteins in diatoms: the biogenesis of the fucoxanthin-chlorophyll *a/c* protein complex. **Journal of Applied Phycol** 6:225-230
55. [Bhaya D](#) and Grossman AR (1993) Characterization of gene clusters encoding the fucoxanthin chlorophyll protein of the diatom *Phaeodactylum tricornutum*. **Nucleic Acids Res** 21: 4458-4466
56. [Bhaya D](#) and A.R. Grossman (1991) A new route for targeting proteins into plastids; evidence from diatoms. **Molec Gen Genet** 229: 400-404.
57. Ray, J., D. Bhaya M. Block and A.R. Grossman (1991) An atypical alkaline phosphatase from *Synechococcus* sp. strain PCC 7942; gene isolation, transcription and inactivation **J Bacteriol** 173: 4297-4309
58. [Bhaya D](#) and Castelfranco PA (1986) Regulation of chlorophyll and cytochrome in isolated developing plastids. **Plant Physiol** 82: 960-964

59. Bhaya D and Castelfranco PA (1986) In vitro synthesis of chlorophyll and assembly of chlorophyll protein complexes in developing plastids of cucumber and peas. **Proc Natl Acad Sci USA** 82: 5370-5374
60. Bhaya D and Jagendorf AT (1985) Alpha and beta subunits of CF1 are synthesized on the thylakoid-bound ribosomes of pea chloroplasts. **Arch Biochim Biophys** 234: 273-278
61. Bhaya D and Jagendorf AT (1984) Synthesis of subunit III of the CF_o on thylakoid-bound polysomes from pea chloroplasts. **Plant Mol. Biol.** 3:273-280
62. Bhaya D and Jagendorf AT (1984) Optimal conditions for the translation of thylakoid-bound ribosomes from pea chloroplasts. **Plant Physiol.** 75: 832-838

BOOK CHAPTERS

63. Bhaya D and Brahamsha B (2014) "Motility and the regulation of phototaxis in cyanobacteria" in "**The Cell Biology of Cyanobacteria**" Editors: E. Flores & A. Herrero, Caister Academic Press (2014)
64. Held N, Childs LM; Davison M, Weitz JS; Whitaker RJ and Bhaya D (2013) "CRISPR-cas systems to probe ecological diversity and host-viral interactions" in **CRISPR Biology** Editors R. Barrangou and J. van der Oost, Springer
65. Bhaya D (2012) "Meta- and functional genomic analysis of oxygenic phototrophy in the hot springs" In "**Functional Genomics and Evolution of Photosynthetic Systems**", ADVANCES IN PHOTOSYNTHESIS AND RESPIRATION Series on Photosynthesis, Springer
66. Bhaya D (2011) "Approaches to understanding population level functional diversity in a microbial community" Invited chapter in "**Handbook of Molecular Microbial Ecology II; Metagenomics in Different Habitats**", Wiley/Blackwell
67. Bhaya D, Schwarz R and Grossman AR (2000) "Molecular responses to environmental stresses" in "**Ecology of Cyanobacteria: Their diversity in time and space**" Ed. B. A. Whitton and M. Potts, Kluwer Academic Publishers Ltd. pp 397-442
68. Grossman AR, Schwarz R, Bhaya D and Dolganov N (1998) Phycobilisome degradation and responses of cyanobacteria to nutrient limitation and high light. **Proceedings of the XIth Intl Congress on Photosynthesis**. Eds. G. Gareb and J. Puszta, Kluwer Academic Publishers Ltd
69. Grossman AR, Bhaya D and Collier JL (1994) Specific and general responses of cyanobacteria to macronutrient deprivation. In **Cellular and Molecular Biology of Phosphate and Phosphorylated Compounds in Microorganisms**. Eds. Torriani-Gorini, Yagil and Silver, ASM Press, Washington DC, USA. pp. 112-118
70. Bhaya D, and Castelfranco PA (1986) Synthesis of chlorophyll and assembly of chlorophyll protein complexes in developing plastids. In G. Akoyunoglou (Ed.). **Chloroplast Development**.

INVITED ARTICLES (not reviewed):

- Bhaya D, (2015) Party with Trees: The dramatic and marvelous trees of Stanford. Essay in **Pacific Horticulture** Fall issue <http://www.pacifichorticulture.org/articles/party-with-trees/>
- Bhaya D, Lindblad P. (2015) Emerging technologies illuminate facets of photosynthesis in cyanobacteria. Introduction to Special issue in Photosynthesis Research. **Photosynth Res**. Sep 22
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