ColonelEmilyL.Lilly

Contact Information

Professor
Biology Department
Virginia Military Institute
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Education

HarvardUniversity — Cambridge, MA
NASA Exobiology Postdoctoral Fellow, 2003 - 2005
Advisor: Colleen Cavanaugh

MassachusettsInstituteofTechnologyand WoodsHoleOceanographicInstitutionJointProgram — Cambridge and Woods Hole, MA
Ph.D. in Biological Oceanography, 2003
Advisor: Donald M. Anderson
Dissertation: Phylogeny & Biogeography of the Toxic Dinoflagellate Alexandrium

SmithCollege — Northampton, MA
B.A. summa cum laude, with highest honors in Biology, 1998
Thesis Advisor: Paulette M. Peckol
Honors Thesis: Physiological Responses of the Coral Porites asteroides and its Algal Symbionts to Moderate Phosphate Enrichment

Simon'sRockCollegeofBard — Great Barrington, MA
A.A. with distinction, 1996

Appointments

2010-present	Professor Biology Department, Virginia Military Institute
2009-2010	Lecturer Department of Biological and Environmental Sciences, Longwood University
2008-2009	Visiting Lecturer Biology Department, University of Virginia
2005-2009	Assistant Professor Biology Department, University of Massachusetts Dartmouth
2003-2005	Postdoctoral Fellow Department of Organismic and Evolutionary Biology, Harvard University
2002-2003	Visiting Professor Department of Natural Sciences, Babson College
2000	Guest Student Centre for Marine Studies, University of Queensland
1998-2003	Graduate Research Fellow Biology Department, Woods Hole Oceanographic Institution
1997-1998	Undergraduate Research Intern Divisions of Marine Biology and Fisheries Rosenstiel School of Marine and Atmospheric Science
1997	Howard Hughes Undergraduate Research Fellow Biology Department, Smith College

Courses Taught

Assistant Professor, Virginia Military Institute, 2010-present

Genetics: a required course for all Biology Majors, including both theoretical and practical applications of Mendelian and modern molecular genetics.

MolecularBiology: an upper-level elective providing students with practical experience in molecular techniques.

IntroductoryBiology,II: the second semester of an introductory biology course, using human biology as a focus to teach biological principles.

Lecturer, Longwood University, 2009-2010

EnvironmentalScience: a non-major science course with laboratory, covering ecology, human impacts on the environment, and potential solutions to current environmental problems.

Assistant Professor, University of Massachusetts, Dartmouth, 2005-2009

Bioinformatics: a hands-on experience in the fundamentals of bioinformatics and genomic analysis, from protein modeling to comparative genomics.

GeneralMicrobiology: microbial physiology, medical microbiology, molecular biology, genetic engineering, diversity, ecology, and virology.

MarineMicrobiology: a seminar with lab for seniors and graduate students covering diversity, virology, harmful algae, and marine pathogens.

MicrobialSymbiosis: a seminar style course for seniors and graduate students investigating beneficial symbiosis involving microbial symbionts.

BiologyofOrganisms, I: The first course for biology majors, covering cell biology, metabolism, genetics, and evolution.

BiologyofOrganisms,II: The second course for biology majors, covering organismal biology, human anatomy, and immunology.

TheOceanEnvironment: a non-major course covering the origins, physics, chemistry, geology, and biology of the oceans, including climate change.

Teaching Fellow, Harvard University, Spring 2004-Spring 2005

Genetics: a first-year course. I taught two sections of 14 students each, leading discussion, recitation, and laboratory sections.

- Awarded the CertificateofDistinctioninTeachingforExcellencein UndergraduateEducation, 2005.

BiologyofSymbiosis: a seminar style course for seniors and graduate students. As teaching fellow, I designed and led laboratory sessions, some lectures, and class discussion.

Visiting Professor, Babson College, Spring 2002-Spring 2003

Course Director, Spring 2003

MarineScience: a non-major fundamental science course. I taught two sections of 36 students.

Oceanography: a new non-major fundamental science course. I assisted Professor Jim Phillips with designing and teaching laboratories.

Instructor, Spring 2002-Fall 2002

MarineScienceLaboratory: developed lectures and ran two weekly lab sections, covering physics, chemistry, geology, and biology of the oceans.

Teaching Assistant, Sea Education Association, Spring 2002
Oceanography: presented two lectures, designed and ran laboratories, advised on research projects, and graded assignments and exams.

Instructor, Woods Hole Children's School of Science, July 2001
LifeUndertheMicroscope: an intensive laboratory course for 12-13 year-olds covering microbial life in the air, land, and sea.

Teaching Assistant, Massachusetts Institute of Technology, Spring 2001
BiologicalOceanography: a graduate course. I wrote and presented a lecture on planktonic symbioses, conducted weekly review sessions, developed class problems sets, tutored, and graded assignments and exams.

Publications

Stern, R.F., Andersen, R.A., Jameson, I. Küpper, F.C., Coffroth, M.-A., Vaulot, D., Le Gall, F., Véron, B., Brand, J.J., Skelton, H., Kasai, F., Lilly, E.L., and Keeling, P.J. Evaluating The Ribosomal Internal Transcribed Spacer (ITS) as a Candidate Dinoflagellate Barcode Marker. Submitted.

Lilly, E.L. 2011. Assigned positions for in-class debates influence student opinions. International Journal of Teaching and Learning in Higher Education, 24(1):in press.

Lilly, E.L., Halanych, K., and Anderson, D. M. 2007. Species boundaries and global biogeography of the dinoflagellate "A. tamarense" complex of the dinoflagellate genus Alexandrium (Dinophyceae). Journal of Phycology, 43: 1329-1338.

Orlova, T.Y., Selina, M.S., Lilly, E.L. Kulis, D.M. and Anderson, D.M. 2007. Morphogenetic and toxin composition variability of Alexandrium tamarense (Dinophyceae) from the east coast of Russia. Phycologia, 46(5): 534-548.

Persich, G.R., Kulis, D., Lilly, E.L., Anderson, D.M. and Garcia, M.T. 2006. Probable origin and toxin profile of Alexandrium tamarense (Lebour) Balech from southern Brazil. Harmful Algae, 5(1): 36-44.

Lilly, E.L., Halanych, K.M., and Anderson, D.M. 2005. Phylogeny, biogeography, and species boundaries within the Alexandrium minutum group. Harmful Algae, 4(6): 1004-1020.

Nascimento, S.M., Purdie, D.A., Lilly, E.L., Larsen, J., Morris, S. 2005. Toxin profile, pigment composition and large subunit rDNA phylogenetic analysis of an Alexandrium minutum (Dinophyceae) strain isolated from the Fleet Lagoon, United Kingdom. Journal of Phycology, 41: 343-353.

Band-Schmidt, C.J., Lilly, E.L., and Anderson, D.M. 2003. Identification of Alexandrium affine and A. margalefi (Dinophyceae) using DNA sequencing and LSU rDNA-based RFLP-PCR assays. Phycologia, 42(3):261-268.

Lilly, E.L., Kulis, D.M., Gentien, P. and Anderson, D.M. 2002. Paralytic shellfish poisoning toxins in France linked to a human-introduced strain of Alexandrium catenella from the Western Pacific: Evidence from DNA and toxin analysis. Journal of Plankton Research, 24(5): 443-452.

Research Students

Virginia Military Institute
Undergraduatestudents:
Caroline Wortham
Arthur Gross
Matthew Marcenelle

University of Massachusetts Dartmouth
Graduatestudents:
Marco Pedulli, Ph.D. student
Amanda Glazier, M.S. student

Undergraduatestudents:
Jonathan Breton
Anubhab Pudisaini
Abigail Toltin
Sarah Toltin
Emilee Towle
Meaghan O'Halloran
Kara Maloney
Laura Atkins
Claudia Martin
Rich Elkins

Harvard University
Undergraduatestudents:
Caitlin Frame
Kathryn Giblin

Woods Hole Oceanographic Institution
Undergraduatestudents:
Stethanie Jacobs
Nina Kanin

Work-Study Research Assistants

University of Massachusetts Dartmouth
Tracy Pearson
Caitlin Sorbello
Nathan Waldron
Kara Maloney
Kerri Ann Kelly
Fardin Ghanimat

Research Grants

DistributionandMolecularGeneticsofToxicCyanobacteriainRockbridgeCounty SurfaceWaterSystems, Graint-In-Aid, $4250

BioremediationScienceatTwoLocalEPASuperfundsites.
Stahl, E.A., Lilly, E.L., (Co-PI). Chancellor's Research Fund/Joseph P. Healey Endowment Grants. $8,283

CompleteGenomeSequencingofCyanobium sp.PCC7001.
George and Betty Moore Foundation, approx. value $150,000

TomlinsonFundGrant, Smith College, 1997-1998, $500

E.J.MurphyGrant, Smith College, 1997 and 1998, $500

Travel Awards

EarlyCareerTravelGrant, American Society of Microbiology, 2006, $750
TeachingDevelopmentTravelGrant, Center for Teaching Excellence Travel Grant, University of Massachsuetts Dartmouth, 2006, $750
NASAExobiologyTravelGrant, 2005, $750
GordonResearchConferenceStudentGrants, 1999 and 2001, $500 & $500
MITJointProgramFundGrant, 2000 and 2002, $500 and $500

Fellowships

PaulM.FyeTeachingFellowship, WHOI, 2001-2002, $22,000
NationalScienceFoundationFellowshipforGraduateStudy, 1998-2001, $100,000
HowardHughesScholarshipforSummerResearch, Smith College, 1997, $4000

Professional Meetings: Research

American Society for Microbiology Virginia Branch 2011 Annual Meeting
Blacksburg, VA 2011
Judge: graduate student presentations

International Society of Protistologists 2nd Meeting of the North American Section
Lexington, VA, 2010
InvitedSpeaker: Evaluating the species concept in the dinoflagellate genus Alexandrium.

108th General Meeting of the American Society of Microbiology
Boston, MA, 2008
PosterTitle: A unique RubisCO found in the cold-adapted methanogen Methanococcoides burtonii.

Second Annual Research Colloquium of the School of Marine Science, Boston, MA, 2008
InvitedSpeaker: Global range expansion in the toxic dinoflagellate genus Alexandrium: Who's who and what's where?

106th General Meeting of the American Society of Microbiology
Orlando, FL, 2006

NSF Frontiers in Integrative Biology Research Workshop on Species in Microbial Communities
Montana State University, Bozeman, MT, 2005.

Eigth NASA Exobiology Principal Investigator's Symposium
Mountain View, CA, 2005
PosterTitle: Cyanobacterial acquisition of Form IA RubisCO by horizontal gene transfer. Silver Certificate of Acheivement for Outstanding Presentation

Boston Bacterial Meeting
Boston, MA, 2005
Postertitle: RubisCO diversity in nitrifying bacteria.

Gordon Research Conference on the Molecular Basis of Microbial Single Carbon Metabolism, South Hadley, MA, 2004
Postertitle: RubisCO diversity in nitrifying bacteria.

Fourth International Symbiosis Society Congress
Halifax, NS, 2003

Tenth International Conference on Harmful Algae
St. Petersburg Beach, FL, 2002
InvitedSpeaker: The global biogeography of the genus Alexandrium.

Gordon Research Conference on Mycotoxins and Phycotoxins
Williamstown, MA, 2001
InvitedStudentSpeaker: Paralytic shellfish poisoning outbreak in France caused by a human-introduced strain of Alexandrium catenella from the western Pacific: Evidence from DNA and toxin analysis

First United States National Conference on Harmful Algal Blooms
Woods Hole, MA, 2000
Postertitle: The global biogeography of the genus Alexandrium.

Ninth International Conference on Harmful Algal Blooms.
Hobart, Tasmania, Australia, 2000
Postertitle: The global biogeography of the genus Alexandrium.

Gordon Research Conference on Mycotoxins and Phycotoxins
Plymouth, NH, 1999
Postertitle: The global biogeography of the genus Alexandrium.

Professional Meetings: Teaching

AACU: Engaged STEM Learning: From Promising to Pervasive Practices
Miami, FL, 24-26 March 2011

Conference on Higher Education Pedagogy
Blacksburg, VA, 3-4 February 2011
InvitedSpeaker: Assigned positions for in-class debates influence student opinions.

American Society of Microbiology Conference for Undergraduate Educators
Beverly, MA, May-June 2008
Postertitle: Petri dish art: an exercise to improve student involvement in the microbiology laboratory.

First Year Success Conference
Dartmouth, MA, 6 June 2007
Active learning in the lecture hall: student-driven active learning exercises vs. clicker-based lecture.

First Year Success Conference
Dartmouth, MA, 6 June 2006

American Society of Microbiology Conference for Undergraduate Educators
Orlando, FL, 19-21 May 2006
Postertitle: Use of the temperature-sensitive mutant Serratia marcescens D1 in a series of laboratory exercises: Bacterial genetics, quorum sensing, and antibiotic production.

Harvard University Derek Bok Center Teaching Conference
Cambridge, MA, 1-2 February 2005

Invited Seminars

Virginia Military Institute, November, 2009

Longwood University, May, 2009

Randolph-Macon College, January, 2009

Washington and Lee University, January, 2009

Hampden-Sydney College, November, 2008

University of Massachusetts Boston, October, 2008

Sweet Briar College, April 2008

University of South Alabama, February 2008

Hood College, Janyary 2008

Southern Connecticut State University, November 2007

UMass School of Marine Science and Technology, September 2007

Massachusetts Institute of Technology, March 2007

University of Massachusetts Dartmouth, March, 2006

Haverford College, December 2004

Woods Hole Oceanographic Institution, January, 2003

Woods Hole Oceanographic Institution, July, 2001

Outreach

Big South Undergraduate Research Symposium April, 2011. Proposal reviewer and session moderator.

Central Virginia Regional Science Fair, March 2009. Judge.

UMass Dartmouth Children's Center for Learning, March, 2008. Water quality testing: what's different about pond, ditch, and tap water?

University of Massachsuetts Dartmouth, Jauary, 2008.
Marine microbes and global warming: can Earth's smallest organisms solve the environment's biggest problem?

University of Massachsuetts Dartmouth, April, 2006.
Marine microbes and global warming: can Earth's smallest organisms solve the environment's biggest problem?

Falmouth High School Career Day, 2002, 2001, and 2000.
Careers in oceanography and marine biology.

Woods Hole Science and Teachers Education Partnership, 2002, 2001, 2000.
Adviser for students on literature review, experimental design, and data analysis for school science fair.

Greenfield Middle School, 1997.
Guest lecturer on life cycles and physiology of phytoplankton and macroalgae.

Fairview Memorial Middle School, 1997.
Guest lecturer, with a group experiment on prey size selection in Carcinus major, the green shore crab, for five sections of seventh grade Biology.

Reviewer

Journal articles: Applied and Environmental Microbiology, Archives of Microbiology, Coral Reefs, European Journal of Phycology, Focus on Microbiology Education, Harmful Algae, Journal of Microbiology and Biology Education, Journal of Phycology, Phycologia, and Protist.

Textbook, Curriculum: McGraw-Hill, Cengage, Microbe Library Curriculum

Grant Proposals: Chilean Research Fund Council, Connecticut Sea Grant, New York Sea Grant Long Island Sound Study

Professional Societies

International Society of Protistology, Virginia Academy of Acience, American Society of Microbiology, International Society for the Study of Harmful Algae

References

Donald M. Anderson, Senior Scientist
Biology Department
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Colleen M. Cavanaugh, Professor
Organismic & Evolutionary Biology
Harvard University
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