

Eunsoo Kim

Contact Information:

Dalhousie University, Department of Biochemistry and Molecular Biology
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Academic History:

University of Wisconsin-Madison, Madison WI	08/2001-08/2006	Ph.D.	Botany
Seoul National University, South Korea	03/1996-08/2000	B.S.	Biology

Research Experience:

- 03/2007-Present Postdoctoral Fellow, Dalhousie University, Halifax, NS
Advisor: Prof. John Archibald
- Complete sequence and analysis of the mitochondrial genome of *Hemiselmis andersenii* CCMP644 (Cryptophyceae).
 - Development of transfection system for *Guillardia theta*
 - Ultrastructure and molecular phylogeny of the heterotrophic euglenid *Petalomonas sphagnophila* and its endosymbionts.
 - Evolution of sterol and isoprene biosynthesis pathways in *Guillardia theta* and *Bigelowiella natans*
- 09/2007-02/2008 Honorary Fellow, University of Wisconsin-Madison, Madison, WI
Advisor: Prof. Linda Graham
- EF2 phylogeny challenges the monophyly of Archaeplastida and Chromalveolata.
- 09/2002-08/2007 Doctoral dissertation research, University of Wisconsin-Madison, Madison, WI
Thesis committee: Profs. Linda Graham (co-advisor), Tom Sharkey (co-advisor), David Baum, Andrea Gargas, David Hanson, Bret Larget
- Phylogenetic position of the green flagellate *Mesostigma viride* based on α - and β -tubulin gene sequences.
 - Evolutionary relationships of the heterotrophic flagellates *Apusomonas proboscidea* (Apusomonadidae) inferred from six nuclear-encoded gene analyses: Implications for early eukaryote diversification.
 - Molecular phylogenies and ultrastructure of three novel heterotrophic Stramenopiles flagellates from acidic lakes: *Apoikia fantasma* (gen. et sp. nov.), *Filos agilis* (gen. et sp. nov.), and *Nanos amicus* (gen. et sp. nov.)
- 09/2002-08/2004 Research Assistant to LTER Northern Temperate Lake Microbial Observatory project, University of Wisconsin-Madison
Advisor: Prof. Linda Graham
- Genetic diversification of the dinoflagellate *Peridinium limbatum* populations in several Wisconsin lakes.
- 08/2001-08/2002 Research Assistant, University of Wisconsin-Madison
Advisor: Prof. Tom Sharkey
- Isoprene emission in plants: Purified the kudzu isoprene synthase protein expressed

in *E. coli* and designed PCR primers for amplifying and sequencing isoprene synthase genes in early diverging plants.

- 12/1999–06/2000 Undergraduate Research Assistant, Seoul National University, South Korea
Senior Thesis Advisor: Prof. Young-Nam Hong
- Desiccation tolerance in *Capsicum* pepper: Sequenced a gene that was expressed at a high level under water-stress conditions

Teaching Experience:

Teaching Assistant, University of Wisconsin-Madison

- Spring 2006 *Botany 100: Survey of Botany* (Introductory botany course for non-majors)
Lecturer: Dr. Linda Graham; lab coordinator: Diane Derouen
Led lab and discussion, prepared weekly assignments, graded assignments
- Fall 2005 *Botany 330: Algae* (Writing intensive)
Lecturer: Dr. Linda Graham; lab coordinator: Diane Derouen
Led lab, developed weekly handouts, prepared and set up two lab exams, graded lab reports and lab exams
- Spring 2005 *Botany 130: Introductory Botany* (for majors)
Lecturers: Dr. Donna Fernandez and Dr. Sara Hotchkiss; lab coordinator: Mike Clayton
Led lab and discussion, graded lab quizzes
- Fall 2004 *Botany 330: Algae* (Writing intensive)
Lecturer: Dr. Linda Graham; lab coordinator: Diane Derouen
Led lab, developed weekly handouts, prepared and set up two lab exams, graded lab reports and lab exams

Publications:

- Graham LE, Kim E, Arancibia-Avila P, Pope-Heinrich A, Graham JM. Evolutionary and ecophysiological significance of sugar utilization by wetland charophycean algae and bryophytes. (in preparation)
- Kim E, Park J, Simpson AGB, Sommerfeld K, Archibald JM. Novel endosymbionts of the euglenid protist *Petalomonas sphagnophila* isolated from *Sphagnum*-dominated peatland (in preparation)
- Kim E, Yubuki N, Leander B, Graham L. 2009. Ultrastructure and 18S rDNA phylogeny of *Apoikia lindahlia* comb. nov. (Chrysophyceae) and its epibiontic protists, *Filos agilis* gen. et sp. nov. (Bicosoecida) and *Nanos amicus* gen. et sp. nov. (Bicosoecida) *Protist* (under revision)
- Kim E, Archibald JM. 2009. Diversity and evolution of plastids and their genomes. In: *The chloroplast: interactions with the environment*. Aronsson H and Sandelius AS (eds) Springer-Verlag.
- Kim E, Graham LE. 2008. EEF2 analysis challenges the monophyly of Archaeplastida and Chromalveolata. *PLoS ONE* 3: 7.
- Kim E, Lane CE, Curtis BA, Kozera C, Bowman S, Archibald JM. Complete sequence and analysis of the

mitochondrial genome of *Hemiselmis andersenii* CCMP644 (Cryptophyceae). *BMC Genomics* 9: 215.

Cuvelier ML, Ortiz A, Kim E, Moehlig H, Richardson DE, Heidelberg JF, Archibald JM, Worden AZ. 2008. Widespread distribution of a unique marine protistan lineage. *Environmental Microbiology* 10: 1621–1634.

Kim E, Simpson AGB, Graham LE. 2006. Evolutionary relationship of apusomonads inferred from taxon rich analyses of six nuclear-encoded genes. *Molecular Biology and Evolution* 23:2455–2466.

Kim E, Wilcox LW, Fawley MW, Graham LE. 2006. Phylogenetic position of the green flagellate *Mesostigma viride* based on α -tubulin and β -tubulin gene sequences. *International Journal of Plant Sciences* 167:873–883.

Kim E, Wilcox LW, Graham LE, Graham JM. 2004. Genetically distinct populations of the dinoflagellate *Peridinium limbatum* in neighboring Northern Wisconsin lakes. *Microbial Ecology* 48:521–527.

Paper and Poster Presentations at National or International Conferences:

- 06/2008 **Invited talk** Chloroplast Workshop, Gothenburg, Sweden
Title: Diversity and evolution of plastids and their genomes (co-authored with John M. Archibald)
- 11/2008 **Invited talk** International Symposium on Protistology, Tsukuba, Japan
Title: Ultrastructure and molecular phylogeny of the heterotrophic euglenid *Petalomonas sphagnophila* and its photosynthetic endosymbionts
- 07/2008 Paper presentation at the Protist 2008 conference, Halifax, Nova Scotia, Canada (co-authored with Naoji Yubuki, Brian Leander and Linda E. Graham)
Title: Episymbioses involving three new genera of heterotrophic stramenopiles flagellates: *Apoikia lindahli* nov. comb. (Chrysophyceae), *Filos agilis* gen. et sp. nov. (Bicosoecida), and *Nanos amicus* gen. et sp. nov. (Bicosoecida)
- 08/2007 Paper presentation at the annual meeting of Phycological Society of America (PSA), Providence, Rhode Island, USA (co-authored with Christopher E. Lane and John M. Archibald)
Title: Complete sequence and analysis of the mitochondrial genome of *Hemiselmis andersenii* CCMP644 (Cryptophyceae).
- 06/2007 Poster presentation at Society for Molecular Biology and Evolution (SMBE) 2007, Halifax, Nova Scotia (co-authored with Linda E. Graham)
Title: Analyses of EF2 and HSP70 gene sequences of *Cyanophora paradoxa* (Glaucochyta), *Goniomonas truncata* (Cryptophyta), *Leucocryptos marina* (Katablepharidae), *Mesostigma viride* (Viridiplantae) and *Thaumatomonas* sp. (Rhizaria).
- 05/2006 Paper presentation at Society for Molecular Biology and Evolution (SMBE) 2006, Tempe, Arizona
Title: Evolutionary relationships of *Apusomonas proboscidea* based on six nuclear-encoded genes (co-authored with Alastair G. B. Simpson and Linda E. Graham)
- 01/2006 Poster presentation at the Evolution of Aquatic Photoautotrophs symposium, New Brunswick, New Jersey
Title: Kingdom-level phylogenies of eukaryotes using ribosomal 18S and 26S rRNA genes (co-authored with Linda E. Graham)
- 02/2005 Paper presentation at International Society for Evolutionary Protistology (ISEP) 2005, Melbourne,

Australia

Title: Application of Bayesian analysis of ribosomal and tubulin gene sequences to unresolved issues in the origin of green plants: Phylogenetic relationships of *Mesostigma viride* and *Apusomonas proboscidea* (co-authored with Lee W. Wilcox, Bret Larget, and Linda E. Graham)

06/2003 Poster presentation at the annual meeting of PSA and SOP, Portland, Oregon

Title: Cryptic Speciation of *Peridinium limbatum* (co-authored with Linda E. Graham and James M. Graham)

06/2002 Poster presentation at International Society for Evolutionary Protistology (ISEP) XIV, Vancouver, Canada

Title: Oligotrophic, *Sphagnum*-dominated, acidic wetlands as a possible habitat for the modern descendent of the heterotrophic ancestor of streptophytes (co-authored with Linda E. Graham and James M. Graham)

Research or Travel Funding:

04/2006 Anna Grant Birge Memorial Award, University of Wisconsin-Madison

06/2005 Anna Grant Birge Memorial Award, University of Wisconsin-Madison

05/2005 Davis Summer Research Fellowship, Department of Botany, University of Wisconsin-Madison

01/2005 Vilas Travel Award, University of Wisconsin-Madison

08/2003 Hoshaw Travel Award, Phycological Society of America

06/2003 Holz-Connor Award, Society of Protozoologists

04/2003 Raper Fund, Department of Botany, University of Wisconsin-Madison

Research Skills:

Protistan and algal cell isolation and culture techniques; basic molecular biology techniques (e.g. PCR, cloning); bioinformatics; light and electron microscopy (TEM and SEM); immunolocalization; fluorescence in situ hybridization

Professional Affiliations:

International Society for Evolutionary Protistology

Society of Molecular Biology and Evolution

Research Interests:

- 1) Process of primary endosymbiosis that gave rise to green algae/land plants, red algae, or glaucophytes
- 2) Modern-day symbiosis between protists and bacteria
- 3) Evolution of isoprenoid and sterol synthesis pathways in eukaryotes
- 4) Development of transfection system in the model cryptophyte alga *Guillardia theta*
- 5) Isolation and characterization of novel microbial eukaryotes