

CURRICULUM VITAE
Frank W.R. Chaplen, Ph.D., P.E.

RECENT WORK HISTORY

Associate Professor July 2002-Present, 0.75 FTE, 12 month appointment
 Department of Biological & Ecological Engineering (BEE),
 Oregon State University, Corvallis, OR
 50% Research proposal writing, actual research and publishing research
 35% Curriculum development, advising students, and classroom teaching
 15% Service, including Head Advisor functions

Assistant Professor June 1996-June 2002, 0.75 FTE, 12 month appointment
 Department of Biological & Ecological Engineering,
 Oregon State University, Corvallis, OR

TEACHING SUMMARY

- Demonstrated excellence developed through continuous assessment, reflection, evaluation and adjustment of course delivery
- Engagement in efforts to learn new theories and applications in pedagogy through WIC and Hybrid Learning Communities

BEE 472/572 Introduction to Food Process Engineering Principles (5 credits; Fall)

67 students enrolled*; Average student rating 5.0/6*
 Offered every year. Service taught for Food Science & Technology students. Will be converted to Hybrid format starting Fall 2016

BEE 473/573 Introduction to Food Process Engineering Design (3 credits; Winter)

52 students enrolled*; Average student rating 5.5/6*
 Offered every year. Service course taught for Food Science & Technology students

BEE 585/586 Metabolic Systems Engineering (4 credit total; Winter)

20 students enrolled**; Average student rating 4.3/6**
 Offered alternate years. Quantitative systems biology research course now taught as graduate only. New for this year is a 1-credit recitation (BEE 586) designed to make course more accessible for students without linear algebra, differential equations and programming experience.

*5-year averages 2010-2015.

**Taught twice. Reflects enrollments when undergraduates took the course.

RESEARCH SUMMARY

- 22 peer reviewed & 3 review articles; 2 patents; 41 posters, abstracts, & meeting papers
- 15 external grants totalling \$7.95 million; Lead-PI on 11 external grants
- \$1.594 million in grants over the past 6 years; \$737,088 my share

Supervisory/Advisor (*Direct Supervisor)

Research Faculty/Post-Doctoral*: 2

Research Assistant*: 2

Major Professor*: 4 Ph.D., 5 M.S.

Committee Member: 16 Ph.D., 16 M.S.

Undergraduate Thesis Advisor: 6 students

High-School Student Mentor: 12 students

Peer Reviewed Publications (10 most recent of 23, 2 additional submitted, 2 patents)

23. Juneja, A., Chaplen, F.W.R., Murthy, G.S. (2016) genome scale metabolic reconstruction of *Chlorella variabilis* for exploring its metabolic potential for biofuels. *Bioresource Technology*. Accepted.
22. Sayavedra-Soto, L., Ferrell, R., Dobie, M., Mellbye, B.L., Chaplen, F.W.R, Buchanan, A., Chang, J., Bottomly, P., Arp, D. (2015) *Nitrobacter winogradskyi* transcriptomic response to low and high ammonium concentrations. *FEMS Microbiology Letters* **362**(3):1-7.
21. Pérez, J., Buchanan, A., Mellbye, B., Ferrell, R., Chang, J., Chaplen, F.W.R, Bottomly, P., Arp, D., Sayavedra-Soto, L.A. (2015) Interactions for *Nitrosomonas europaea* and *Nitrobacter Winogradskyi* grown in co-culture. *Archives Microbiol.* **197**:79-89.
20. Avanasi, R.N., Murthy, G.S., Chaplen FWR, and Beatty, C. (2013) Fermentation of

- flucose/xylose,xyulose in the presence of furfural by yeast for ethanol production. *Biological Engineering Transactions*. **6(3)**:157-172.
19. Xu, S., Fan, Y., Schaller, R., Jiao, J., Liu, H. and Chaplen, F.W.R. (2012) Enhanced performance and study of microbial electrochemical cells using Fe nanoparticle-decorated anodes. *Appl. Microbiol. Biotechnol.* **93**:871-880.
 18. Burrows, E.H., Chaplen, F.W.R. and Ely, R.L. (2011) Effect of various inhibitors of the electron transport chain of *Synechocystis* sp. PCC 6803 on 24-hour hydrogen production. *Bioresource Technology*, **102**:3062-3070.
 17. R. Schaller, Y. Fan, S. Xu, A. Fern, F. Chaplen, H. Liu, and J. Jiao. (2010) "Vertically Aligned Multi-walled Carbon Nanotube Decorated Anodes for Microbial Fuel Cells." in *Nanotubes and Related Nanostructures — 2009*, edited by Y.K. Yap, K. Hata, A. Loiseau (Mater. Res. Soc. Symp. Proc. Volume 1204, Warrendale, PA, 2010), 1204-K14-42.
 16. Fan, Y., Xu, S., Schaller, R., Jiao, J., Chaplen, F.W.R., Fern, A. and Liu, H. (2010) Nanoparticle decorated anodes for enhanced current generation in microbial electrochemical cells. *Biosensors and Bioelectronics*, **26**:1908-1912.
 15. Javad Azimi, Xiaoli Fern, Alan Fern, Elizabeth Burrows, Frank Chaplen, Yanzhen Fan, Hong Liu, Jun Jiao, Rebecca Schaller. (2010) Myopic Policies for Budgeted Optimization with Constrained Experiments. *AAAI Conference on Artificial Intelligence (AAAI-10)*.
 14. R. Schaller, Y. Fan, S. Xu, A. Fern, F. Chaplen, H. Liu, and J. Jiao. (2009) "Fabrication of Nanomodified Anodes for Power Density Enhancement of Microbial Fuel Cells" in *Materials for Renewable Energy at the Society and Technology Nexus – 2009*, edited by Reuben T. Collins (Mater. Res. Soc. Symp. Proc. Volume 1170E, Warrendale, PA, 2009), #1170-R05-13.
 13. Burrows, E.H., Wong, W.K., Fern, X., Chaplen, F.W.R. and Ely, R.L. (2009) Optimization of pH and Nitrogen for Enhanced Hydrogen Production by *Synechocystis* sp. PCC 6803 via Statistical and Machine Learning Methods. *Biotech. Prog.* **25(4)**:1009-1017.

Note: "underline" denotes major contributor as per tenure dossier guidelines

Posters, Abstracts and Meeting Papers (8 most recent of 41)

41. Chaplen, F.W.R. 2016 Incidence and potential implications of methylglyoxal in industrial cell culture revisited. *Cell Culture Engineering XV*, Palm Springs, CA, May 2016.
40. Chaplen, F.W.R., Ta, C.T., Higgins, C., Bottomley, P. and Sayavedra-Soto, L. 2014 Constraints-based modeling to elucidate the impacts of environmental dynamics on nitrogen gases production by soil nitrifying bacteria *Nitrosomonas europaea* and *Nitrobacter winogradskyi*. *ACS Natl. Mtg.*, Denver, CO, March 2015.
39. Ta, C.T., Ferrell, R.V., Chaplen, F.W.R. and, Sayavedra-Soto, L. 2015. *Nitrobacter winogradskyi* responses to FE Limitation. *ACS Natl. Mtg.*, Denver, CO, March 2015.
38. Chaplen, F.W.R., Perez, J., Bottomley, P., Buchanan, A., Murthy, G.S., Chang, J.H., Sayavedra-Soto, L. 2014. Model integration for elucidating the coupled environmental dynamics of the nitrifying bacteria *Nitrosomonas europaea* and *Nitrobacter winogradskyi*. *ACS Natl. Mtg.*, Dallas, TX, March 2014.
37. Chaplen, F.W.R., Perez, J., Bottomley, P., Buchanan, A., Murthy, G.S., Chang, J.H., Sayavedra-Soto, L. 2014. Elucidating the coupled environmental dynamics of the nitrifying bacteria *Nitrosomonas europaea* and *Nitrobacter winogradskyi* grown in chemostat co-culture. *ACS Natl. Mtg.*, Dallas, TX, March 2014.
36. Chaplen, F.W.R., Buchanan, A., Chang, J.H., Sayavedra-Soto, L. 2013. Constraints-based modeling of the nitrifying bacteria *Nitrosomonas europaea* and *Nitrobacter hamburgensis*. *ACS Natl. Mtg.*, LA April 2013.
35. Avanasir, R., Chaplen, F.W.R., Murthy, G.S. 2010. Hemicellulose fermentation by industrial yeast *Saccharomyces cerevisiae*. *ASABE 2010 Meeting*, Pittsburgh, PA, 2010.
34. Avanasir, R., Chaplen, F.W.R., Murthy, G.S. 2010. A flux balance based approach of hemicelluloses fermentation to ethanol by industrial yeast *Saccharomyces cerevisiae*. *ASABE 2010 Meeting*, Pittsburgh, PA, 2010.
33. Joshi, C., Chaplen, F.W.R., Murthy, G.S. 2010. Modeling lipid and carbohydrate distribution in green algae using constraints based modeling. *ASABE 2010 Meeting*, Pittsburgh, PA, 2010.

External Grants and Contracts (Past 6 Years: \$7.95 million total)

Metabolic engineering of light and dark biochemical pathways of wild-type and mutant strains of *Synechocystis* PCC 6803 for maximal, 24-hour production of hydrogen gas (Frank Chaplen with R.L. Ely (PI)) *DOE/NSF*, 2005-2009; **\$869,189**

Biological Energetics: Nanoenhanced microbial fuel cells for power generation and microscale devices and nanoelectronic applications (Frank Chaplen (PI) with H. Liu, J. Jiao and A. Fern) *DOD/ARL ONAMI Center*, 2007-2011; **\$500,000**

EAGER: Development of Multi-Population ¹³C Isotopic Analyses for Elucidating Intra-Cellular Metabolic Responses within Mixed Populations of Nitrifying Bacteria (Frank Chaplen (PI) with L. Sayavedra-Soto) *National Science Foundation*, 2012-2016; **\$175,004**

RI: Small: Automated Planning Experiments for Design Optimization (Alan Fern (PI) with Xiaoli Fern; F. Chaplen and H. Liu Senior Personnel) *National Science Foundation*, 2013-2016; **\$136,059**

Development of Design Tools and Considerations for Increasing the Efficiency of Denitrifying Permeable Reactive Barriers (Frank Chaplen (PI) with Troy Downing) *Oregon Dairy Farmers Association*, 2016-2017; **\$50,000**

HEAD ADVISOR

Advisors Committee, College of Engineering, Fall 2007-2013; 2015-present

- Participated in policy-focused discussions and decision making for advising in the College of Engineering

First Year Experience Committee, College of Engineering, Fall 2013

- Helped develop initial blueprint for first year experience and intrusive advising in College of Engineering

CURRICULUM & ASSESSMENT

Undergraduate Committee, BEE, 1997- 2002; 2007-2013 (Chair); 2013-present

- Led implementation and maintenance activities for the Ecological Engineering B.S. Program
- Contributed and participated in the Bioengineering B.S. Program (currently housed in the School of Chemical, Biological and Environmental Engineering in College of Engineering)

Graduate Committee, BEE, 1996-2009, 2015-present

- Provided oversight of department program in Biological & Ecological Engineering. (Ph.D and M.S.)

ABET Coordinator, Ecological Engineering B.S. Program, 2011 and 2014 cycles.

- Worked with COE assessment group to develop and implement procedures for Ecological Engineering B.S. program assessment and accreditation
- Wrote self-study report for Ecological Engineering B.S. program with input from faculty and other stakeholders

Curriculum Council, University, 2005-2008, 2011-2013

- Contributed to review teams for Philosophy, English and Physics programs and co-authored assessment reports with internal external reviewers based self-study and on-site visit
- Reviewed Category I and Category II curriculum proposals as part of the curriculum review process
- Worked to resolve substantive issues related to curricula and program delivery at OSU

Curriculum Committee, College of Engineering, 2010-2013

- Performed oversight of undergraduate curricula for the College of Engineering

Graduate Committee, College of Engineering 2005-2008

- Helped oversight of graduate curricula for College of Engineering

OTHER SERVICE**University Service****Departmental**

- Water Resource Engineer Search Committee, Winter 2016
- Unit Safety Coordinator, 2011-2015
- Space Committee, 2000-2009
- Faculty Status Committee, 2009-2011 (Chair)
- Bioproducts Engineer Search Committee (Chair), Fall 2006
- River Engineer Search Committee, Fall 2005
- Bioproducts Engineer Search Committee (Chair), Fall 2005
- Bioproducts Engineer Search Committee (Chair), Fall 2004
- Bioengineering Search Committee (Chair), Fall 2002

- Whittaker-Funded Bioengineering Faculty Search Committee, Fall 2000
- Scholarship Committee, 1997-2006

College

- Safety Advisory Group, College of Agricultural Sciences, 2012-2015
- Diversity Committee, College of Agriculture Sciences, 2006-2008
- Diversity Committee, College of Engineering, 2006-2008
- Internship Committee, College of Engineering, Fall 2000-2004
- Food Microbiology Search Committee, Department of Microbiology, 2000

Institutional

- Exec Committee, Microscale Energy and Chemical Systems (MECS), 2000-2005
- Scientific Advisory Board, Center for Gene Research and Biocomputing , 1997-2000

National Service (Past 5 Years)

- Reviewer for journals, proposals and books
- NSF Review Panel, 2016, NRT Proposals
- NSF Review Panel, 2014, NRT Proposals
- NSF Review Panel, 2013, Engineering Center Proposals
- NSF Review Panel, 2011, CAREER

EDUCATION & CERTIFICATIONS

Ph.D. University of Wisconsin-Madison, Chemical Engineering, 1996.

- Major Field: Chemical Engineering
- Minor Field: Molecular and Cellular Biology, Bacteriology, Biochemistry and Genetics
- Language Minor: French

B.S. Oregon State University, Chemical Engineering, 1989.

P.E. Professional Engineer, Chemical Engineering, Oregon Cert. No. 46822PE , 2011

AWARDS

National Awards

- National Institutes of Health Biotechnology Training Grant Fellowship, 1990-1993
- Tau Beta Phi - National Engineering Honorary, 1989

University Awards

- Oregon State University Engelbrecht Young Faculty Award, 2001
- W.R. Grace & Co. Fellowship, 1994-1995
- University of Wisconsin-Madison Graduate School Fellowship, 1993-1994
- General Electric Teaching Fellowship, 1989-1990

VOLUNTEER ACTIVITIES

Boy Scouts of America, Oregon Trail Council, Troop 3 and Crew 2003, Corvallis, OR

Tree Lot Manager, Christmas Tree Sales (2012 to Present)

- Organized the activities of about 50 volunteers (each providing approximately 40 hours of volunteer time and ranging in age from 10 to 81) around the major fund-raiser for the troop

PERSONAL

- Dual Citizenship: United States and United Kingdom
- Born and Raised in England. Moved to U.S.A. in 1984
- Lived in Kuwait, Middle East 1975-1979

CONTACT INFORMATION

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