**CURRICULUM VITAE**

**Frank W.R. Chaplen**

Department of Biological & Ecological Engineering

College of Agricultural Sciences

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#### EDUCATION AND EMPLOYMENT INFORMATION

Degrees

**Ph.D.** University of Wisconsin-Madison, Department of 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, Department of Chemical Engineering, 1989.

### Academic Positions

**Associate Professor** (0.75 FTE; 65% Research, 25% Teaching, 10% Service) September 2017-Present; Dept. of Biological & Ecological Engineering, Oregon State University, Corvallis, OR

**Associate Professor** **and Head Advisor** (0.75 FTE; 50% Research, 35% Teaching, 15% Service) September 2015-September 2017, Dept.of Biological & Ecological Engineering, Oregon State University, Corvallis, OR

**Associate Professor** (0.75 FTE; 65% Research, 25% Teaching, 10% Service) September 2013-September 2015; Dept. of Biological & Ecological Engineering, Oregon State University, Corvallis, OR

**Associate Professor** **and Head Advisor** (0.75 FTE; 0.25 FTE Research, 0.25 FTE Teaching, 0.25 FTE Service) July 2007-August 2013; Dept. of Biological & Ecological Engineering, Oregon State University, Corvallis, OR

**Associate Professor** (0.75 FTE; 65% Research, 25% Teaching, 10% Service) July 2002-June 2007; Dept.of Biological & Ecological Engineering, Oregon State University, Corvallis, OR

**Assistant Professor** (0.75 FTE; 65% Research, 25% Teaching, 10% Service) June 1996-June 2002; Dept.of Biological & Ecological Engineering, Oregon State University, Corvallis, OR

**Research Assistant** August 1989-May 1996

Department of Chemical Engineering, University of Wisconsin-Madison, Madison, WI

**Instructor** July 1995-August 1995

Department of Chemical Engineering, University of Wisconsin-Madison, Madison, WI

**Faculty Assistant** January 1996-May 1996

Department of Chemical Engineering, University of Wisconsin-Madison, Madison, WI

**Teaching Assistant** 5 Semesters during August 1989-December 1994

Department of Chemical Engineering, University of Wisconsin-Madison, Madison, WI

Research Specialization

**Biochemical Engineering:** metabolic engineering, modeling of metabolic and regulatory networks, nitrogen and carbon cycling, microbial processes in soils and elsewhere.

### Industrial Positions

**School of PE,** Deliver professional engineering review courses online 2013-2014.

**Process Engineering Intern** May 1992-September 1992, Abbott Laboratories, North Chicago, Illinois

Registration

Engineer-in-Training (EIT; 1989), Professional Engineer (PE; 2010)

#### TEACHING, ADVISING AND OTHER ASSIGNMENTS

**Teaching Philosophy**

My teaching philosophy is to incorporate the latest findings in pedagogy into my classroom teaching environment and to strive to reach all learners. In order to do this, I take advantage of the rich opportunities present at my institution to continuously improve the courses I teach. This has culminated in the conversion of all courses to a hybrid, flipped classroom format that uses the Canvas learning environment as a delivery vehicle. The hybrid, flipped classroom format is viewed as a highly effective method of course delivery from a pedagogical perspective and can also be more resource efficient in terms of classroom and instructor time. The requirement for significant online materials helps to reach learners that do not learn most effectively through lectures and helps to accommodate those who require notetakers.

1. **Credit Courses and Workshops**

**Pre-Promotion to Associate Professor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Course | Title | Enrollment | Term | Year |
| BIOE 458/558 | Bioprocess Engng III: Eukaryotic Cell Culture | 7 | W | 1997 |
| BIOE 490/590 | Bioprocess Engineering Design I | 2 | W | 1997 |
| BIOE 491/591 | Bioprocess Engineering Design II | 2 | S | 1997 |
| BIOE 458/558 | Bioprocess Engng III: Eukaryotic Cell Culture | 2 | W | 1998 |
| BIOE 458/558 | Bioprocess Engng III: Eukaryotic Cell Culture | 4 | W | 1999 |
| BIOE 490/590 | Bioprocess Engineering Design I | 3 | W | 1999 |
| BIOE 491/591 | Bioprocess Engineering Design II | 3 | S | 1999 |
| BIOE 459/559 | Fermentation Engineering Laboratory | 3 | S | 1999 |
| BIOE 458/558 | Bioprocess Engng III: Eukaryotic Cell Culture | 3 | W | 2000 |
| BIOE 459/559 | Fermentation Engineering Laboratory | 3 | S | 2000 |
| BIOE 458/558 | Bioprocess Engng III: Eukaryotic Cell Culture | 2 | W | 2002 |
| BIOE 459/559 | Fermentation Engineering Laboratory | 2 | S | 2002 |

**Post-Promotion to Associate Professor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Course | Title | Enrollment | Term | Year |
| BIOE 485/585 | Metabolic Engineering | 15 | S | 2004 |
| BEE 473/573 | Food Engineering II | 30 | S | 2006 |
| BEE 472/572 | Food Engineering I | 30 | W | 2006 |
| BIOE 485/585 | Metabolic Engineering | 2 | S | 2006 |
| Course | Title | Enrollment | Term | Year |
| BEE 473/573 | Food Engineering II | 25 | S | 2007 |
| BEE 472/572 | Food Engineering I | 31 | W | 2007 |
| BIOE 485/585 | Metabolic Engineering | 6 | S | 2007 |
| BEE 473/573 | Food Engineering II | 27 | S | 2008 |
| BEE 472/572 | Food Engineering I | 35 | W | 2008 |
| BIOE 485/585 | Metabolic Engineering | 10 | S | 2008 |
| BEE 473/573 | Food Engineering II | 35 | S | 2009 |
| BEE 472/572 | Food Engineering I | 40 | W | 2009 |
| BEE 322 | Ecological Engineering Thermodynamics | 7 | W | 2009 |
| BEE 473/573 | Food Engineering II | 45 | S | 2010 |
| BEE 472/572 | Food Engineering I | 55 | W | 2010 |
| BIOE 485/585 | Metabolic Engineering | 25 | S | 2010 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 37 | W | 2011 |
| BEE 472/572 | Introduction to Food Engineering Principles | 50 | F | 2011 |
| BIOE 485/585 | Metabolic Engineering | 14 | S | 2011 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 50 | W | 2012 |
| BEE 472/572 | Introduction to Food Engineering Principles | 65 | F | 2012 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 74 | W | 2013 |
| BEE 472/572 | Introduction to Food Engineering Principles | 98 | F | 2013 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 56 | W | 2014 |
| BEE 472/572 | Introduction to Food Engineering Principles | 66 | F | 2014 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 59 | W | 2015 |
| BEE 472/572 | Introduction to Food Engineering Principles | 71 | F | 2015 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 43 | W | 2016 |
| BEE 472/572 | Introduction to Food Engineering Principles | 51 | F | 2016 |
| FST 499 | Advanced Food Processing | 49 | S | 2016 |
| BEE 399 | Microbial Processes in Ecol Engng Design | 3 | W | 2016 |
| BEE 585/586 | Metabolic Systems Engineering | 5 | F | 2016 |
| ENSC 599 | Microbial Processes in Ecol Engng Design | 4 | S | 2016 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 47 | W | 2017 |
| BEE 472/572 | Introduction to Food Engineering Principles | 46 | F | 2017 |
| FST 499 | Advanced Food Processing | 47 | S | 2017 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 29 | W | 2018 |
| BEE 472/572 | Introduction to Food Engineering Principles | 41 | F | 2018 |
| Course | Title | Enrollment | Term | Year |
| FST 499 | Advanced Food Processing | 29 | S | 2018 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 39 | W | 2019 |
| BEE 472/572 | Introduction to Food Engineering Principles | 47 | F | 2019 |
| BEE 101 | Ecological Engineering I | 13 | F | 2019 |
| BEE 473/573 | Introduction to Food Engineering Proc Des | 37 | W | 2020 |
| BEE 472/572 | Introduction to Food Engineering Principles | 37 | F | 2020 |
| BEE 362 | Microbial Processes in Ecological Engng | Planned | S | 2021 |
| BEE 101 | Ecological Engineering I | 13 | F | 2019 |
| BEE 101 | Ecological Engineering I | 24 | F | 2020 |

1. **Non-Credit Courses and Workshops**

Metabolic Engineering Systems workshop June 2021.

#### Curriculum Development and Advising

|  |
| --- |
| **Graduate Committee, BEE, 2016-2018**   * Prepared curriculum proposal for E-Campus Biological & Ecological Engng. MS Program   **Undergraduate Committee, BEE, 1997- 2002; 2007-2013 (Chair); 2013-present**   * Led implementation and maintainence activities for the Ecological Engineering B.S. Program through three major programmatic changes * Contributed and participated in the Bioengineering B.S. Program (currently housed in the School of Chemical, Biological and Environmental Engineering in College of Engineering)   **Head Academic Advisor, Ecological Engineering BS Program, 2007-2013; 2015-2017.**   * Developed programs of study for as many as 110 students annually * Maintained MyDegrees and Degree Audits * Help students manage academic and personal crises that impacted course of study and degree progress * Interfaced with the College of Engineering for program development and policy development through the Head Advisor committee.   **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 reports for Ecological Engineering B.S. program with input from faculty and other stakeholders   **Curriculum Council, University, 2005-2008, 2011-2013**   * 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 substantial issues related to curricula and program delivery at OSU   **Curriculum Committee, College of Engineering, 2010-2013, 2016-19 (Chair)**   * Oversight of undergraduate and graduate curricula for College of Engineering |
| **Budget Committee, University, 2019-Present**   * Oversight of program proposal budgets for faculty senate committee. |
| **Budget Committee, University, 2021-Present (Chair)**   * Oversight of program proposal budgets for faculty senate committee. |

The Ecological Engineering B.S. program was a collaborative effort of the faculty of the department of Biological & Ecological Engineering under the leadership of John Bolte. The following courses have been developed in total or in part as a result of my activities. Collaborative efforts are indicated as appropriate:

**BEE 101 Ecological Engineering I** (3) Fall Revamped course for incoming First Years in Ecological Engineering program. No suitable textbook.

**BEE 362 Ecological Engineering Microbial Processes** (3) Spring New course developed for the Ecological Engineering Program based on BEE 399. Developed from scratch. No suitable textbook.

**BEE 399 Microbial Processes for Ecological Engineering Design** (4) Spring New course developed for the Ecological Engineering Program. Lead Instructor. Co-Taught with Gerrad Jones. Developed from scratch. No suitable textbook.

**FST 499 Advanced Food Processing** (3) Spring Course developed for the Food Science Program. Originally taught by Antonio Torres but developed from scratch. Suitable textbook available.

**BEE 452/552 and BEE 472/572 Introduction to Process Engineering** (4) Winter Revamped food engineering courses to incorporate new material and broaden appeal. Prior course notes available. Suitable textbook available.

**BEE 453/553 and BEE 473/573 Introduction to Process Engineering Design** (4) Fall Revamped food engineering courses to incorporate new material and broaden appeal. Prior course notes available. Suitable textbook available.

**BEE 322 Ecological Engineering Thermodynamics and Transfer Processes** (4)

New course developed with Matthew Cox for Ecological Engineering B.S. program. Suitable textbook available. Now taught by Chad Higgins.

**BEE 585/586 and BIOE 485/585 Metabolic (Systems) Engineering** (3) Mathematical and experimental techniques for quantitative descriptions of microbial bioreaction processes and an introduction to the principles and methodologies of metabolic engineering. Developed from scratch. No suitable textbook.

**BIOE 458/558 Bioprocess Engineering III: Eukaryotic Cell Culture** (3)

Characterization of production processes for biologically derived products from eukaryotic organisms. The emphasis will be on process kinetics and the design of bioreactor systems. No suitable textbook.

**BIOE 459/559 Fermentation Engineering Laboratory** (2)

Senior fermentation laboratory. Developed from scratch with assistance of Michelle Bothwell. No suitable textbook.

**BIOE 490/590 and BIOE 491/591 Bioprocess Engineering Design I and II** (3, 3)

Capstone process design courses based on the class material taught in Junior and Senior years. Lead instructor. Co-taught with Marshall English (Bioresource Engineering). Developed from scratch. No suitable textbook.

1. **Graduate, Undergraduate, and High-School Students and Post-Doctoral Advisees**

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| **Postdoctoral Advisor** |
| Rosalyn H. Upson 1998-2002  Karen P. Dierksen 1999-2002 |
| 100% of Postdoctoral Trainees were underrepresented in STEM |

|  |  |
| --- | --- |
| **Major Professor** | |
| Ph.D. Student  Ashton Cummings (BEE) x2024  Shoutao Xu with H. Liu (BEE) 2011  Elizabeth Burrows with R. Ely (BEE) 2009  Trina Siebert with J. Bolte (BRE) 2004  Ling Zhang with A. Velayudhan (BRE) 2003 | M.S. Student  Elsie Weisshaar (BEE) x2020  Adnan Morkuc (WRE) 2020  Travis A. Grohman (BEE) 2017  Robert Hall, (BEE) 2011  Arthi Narayanan (BRE) 2004  Sarocha Kingkeohoi (BRE) 2003  Charla K. Triplett (BRE) 1999 |
| 100% of PhD students and 57% of MS students advised were underrepresented in STEM | |

|  |  |  |
| --- | --- | --- |
| **Committee Member** | | |
| Ph.D. Students  (GR) Jessee Svoboda BIOE x2023  Luguang Wang BEE 2020  (GR) Christian Brown CHE x2020  Cheng Li (BEE) 2017  Keaton Lesnik (BEE) 2017  William Hohenschuh (BEE) 2016  (GR) Timothy Putman (MCB) 2014  (GR) Changho Choi (ChE) 2013  Markael Luterra (BEE) 2013  (GR) Shaun Marcott (GEO) 2011  David Dixon (BEE) 2010  Jed Eberly (BEE) 2010  Hongqiang Hu (BEE) 2009  Sun-Hwa Park (BEE) 2008  Sergio Almonacid (BEE) 2005  Jason Polzin (ChE) 2005  (GR) Hanshi (Henry) N. Qi. (ChE) 2004  Iva Orhanovic (EECS) 2003  Yao-Ming Haung (ChE) 2001  Pichaya Boonprasom (BRE) 2001  Sundar Ramanan (BRE) 2000  Nilibon Podhipleux (BRE) 1998 | M.S. Students  (GR) Kevin Nelson (FST) x2020  (GR) Sebastian Ramirez (FST) 2020  Joey Minarsich (FST) 2016  Tyler Kirkendall (ENVE) 2015  Yousef Alanazi (CHE) 2014  Alex Vian (CHE) 2013  (GR) Jonathan Giska (ENVE) 2013  (GR) Shawn Fells (FST) 2013  (GR) Lin Koh (FST) 2012  (GR) Daniel Vogler (ENVE) 2012  (GR) Nathaniel Coussens (ChE) 2011  (GR) Tresider Burns (FST) 2011  Jeremy Chignall (BEE) 2011  Stephanie Ichien (MRM) 2010  Ragothanam Avanasi (BEE) 2010  Jie Fang (EECS) 2005  Ganesh Vissvesvaran (ChE) 2004  Vivek Sharma (EECS) 2004  Bertrand Boichon (EECS) 2003  Ji-Seok Liew (EECS) 2003  Voranon Kiettrisalpipop (EECS) 2003  (GR) Nicolas Roussel, M.S. EECS, 2003  (GR) Artit Samretvanich (MS; ChE), 1997 (GR) Ning Li (MS;ECE) 1997  Han Wu (BRE), 1997 | |
| 73% of PhD students and 77% of MS students that on their committee were underrepresented in STEM. | | |
| **Advisor** | |
| Other Graduate. Students  Angela Teng, 2002-2003  Chengyan Peng, 2000-2002  Mohan Choodamani, 1996-1998 | Undergraduate Students  Sirikul “Indi” Sriprisan, 1997-1998  Christine A. Salstrom, 1998-2000  Robert Braden, 1998-2000  Angela Teng (EECS), 2001-2002  Robert Elder (Honors College) 2008-2009  Charlie Ta (Bioresource Research) 2013-2016  Jordyn McDonald (STEM Leadership) 2017-  Luca Piscitello, 2019-  Richard Villanova (STEM Leadership) 2019-  High-School Students  Jamie Bergen, 1998-1999  Mark McGuire 2008-2009  Sandy Liu 2008-2009  Kelsey Baker 2008-2009  Jennifer Swanson 2008-2009  Ryan Frederick 2008-2009 |
| 66% of undergraduate and 66% of high school students advised have been underrepresented in STEM. | |

1. **Team and Collaborative Efforts**

The Ecological Engineering B.S. program was a collaborative effort of the faculty of the department of Biological & Ecological Engineering under the leadership of John Bolte. Other collaborative efforts are indicated below as appropriate:

**BEE 399 Microbial Processes for Ecological Engineering Design** (4) Spring New course developed for the Ecological Engineering Program. Lead Instructor. Co-Taught with Gerrad Jones. Developed from scratch. No suitable textbook.

**BEE 322 Ecological Engineering Thermodynamics and Transfer Processes** (4)

New course developed with Matthew Cox for Ecological Engineering B.S. program. Suitable textbook available. Now taught by Chad Higgins.

**BIOE 459/559 Fermentation Engineering Laboratory** (2)

Senior fermentation laboratory. Developed from scratch with assistance of Michelle Bothwell. No suitable textbook.

**BIOE 490/590 and BIOE 491/591 Bioprocess Engineering Design I and II** (3, 3)

Capstone process design courses based on the class material taught in Junior and Senior years. Lead instructor. Co-taught with Marshall English (Bioresource Engineering). Developed from scratch. No suitable textbook.

1. **International Efforts**

Helped advise Coline Mepillat, a student at the University of Auckland, New Zealand.

**2. Student and Participant/Client Evaluation**

**a. Credit Courses**

**Pre-Promotion to Associate Professor**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | Instructor Rating | | | Course Rating | | |
| Course | Term | Enrollment/  Responses | Ind. | BEE | CAS | Ind. | BEE | CAS |
| BIOE 458/558 | W 1997 | 7/0 | ND | ND | ND | ND | ND | ND |
|  | W 1998 | 2/0 | ND | ND | ND | ND | ND | ND |
|  | W 1999 | 4/0 | ND | ND | ND | ND | ND | ND |
|  | W 2000 | 5/0 | ND | ND | ND | ND | ND | ND |
|  | W 2002 | 2/0 | ND | ND | ND | ND | ND | ND |
| BIOE 459/559 | S 1999 | 3/0 | ND | ND | ND | ND | ND | ND |
|  | S 2000 | 3/0 | ND | ND | ND | ND | ND | ND |
|  | S 2002 | 2/0 | ND | ND | ND | ND | ND | ND |
| BIOE 490/590 | W 1997 | 2/0 | ND | ND | ND | ND | ND | ND |
|  | W 1999 | 2/0 | ND | ND | ND | ND | ND | ND |
| BIOE 491/591 | S 1997 | 3/0 | ND | ND | ND | ND | ND | ND |
|  | S 1999 | 3/0 | ND | ND | ND | ND | ND | ND |

N.D., No data; No electronic data available prior to F 2011.

**Post-Promotion to Associate Professor**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | Instructor Rating | | | Course Rating | | |
| Course | Term | Enrollment/  Responses\* | Ind. | BEE | CAS | Ind. | BEE | CAS |
| BEE 452/552 | W 2007 | 30 | ND | ND | ND | ND | ND | ND |
|  | W 2008 | 31 | ND | ND | ND | ND | ND | ND |
|  | W 2009 | 35 | ND | ND | ND | ND | ND | ND |
|  | W 2010 | 40 | ND | ND | ND | ND | ND | ND |
|  | W 2011 | 55 | ND | ND | ND | ND | ND | ND |
| BEE 472/572 | F 2011 | 47/33 | 5.0 | 4.8 | 4.8 | 5.0 | 4.8 | 4.8 |
|  | F 2012 | 62/47 | 5.1 | 4.9 | 4.8 | 5.1 | 4.9 | 4.8 |
|  | F 2013 | 88/47 | 5.1 | 4.8 | 4.9 | 5.1 | 4.8 | 4.9 |
|  | F 2014 | 67/45 | 5.4 | 5.0 | 5.0 | 5.4 | 5.0 | 5.0 |
|  | F 2015 | 71/43 | 5.3 | 4.9 | 5.1 | 5.3 | 4.9 | 5.1 |

N.D., No data; No electronic data available prior to F 2011.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | Instructor Rating | | | Course Rating | | |
| Course | Term | Enrollment/  Responses | Ind. | BEE | CAS | Ind. | BEE | CAS |
| BEE 472/572 | F 2016 | 51/33 | 5.0 | 4.7 | 5.2 | 5.0 | 4.7 | 5.2 |
|  | F 2017 | 58/27 | 5.0 | 5.0 | 5.2 | 5.0 | 5.0 | 5.2 |
|  | F 2018 | 41/17 | 4.2 | 5.1 | 5.3 | 4.2 | 5.1 | 5.3 |
|  | F 2019 | 41/11 | 5.7 | 4.8 | 5.3 | 5.7 | 4.8 | 5.3 |
|  | F 2020 | 42/9 | 5.3 | 5.4 | 5.5 | 5 .0 | 5.1 | 5.5 |
| BEE 453/553 | S 2007 | 30 | ND | ND | ND | ND | ND | ND |
|  | S 2008 | 31 | ND | ND | ND | ND | ND | ND |
|  | S 2009 | 35 | ND | ND | ND | ND | ND | ND |
|  | S 2010 | 40 | ND | ND | ND | ND | ND | ND |
|  | S 2011 | 45 | ND | ND | ND | ND | ND | ND |
| BEE 473/573 | W 2012 | 37/26 | 5.6 | 5.2 | 4.9 | 5.6 | 5.2 | 4.9 |
|  | W 2013 | 53/22 | 5.2 | 5.0 | 4.8 | 5.2 | 5.0 | 4.8 |
|  | W 2014 | 74/45 | 5.6 | 5.0 | 4.9 | 5.6 | 5.0 | 4.9 |
|  | W 2015 | 56/40 | 5.8 | 5.3 | 5.0 | 5.8 | 5.3 | 5.0 |
|  | W 2016 | 59/39 | 5.8 | 5.1 | 5.1 | 5.8 | 5.1 | 5.1 |
|  | W 2017 | 43/23 | 4.9 | 4.7 | 5.1 | 4.9 | 4.7 | 5.1 |
|  | W 2018 | 47/13 | 5.5 | 5.0 | 5.2 | 5.5 | 5.0 | 5.2 |
|  | W 2019 | 29/14 | 5.6 | 5.0 | 5.2 | 5.6 | 5.0 | 5.2 |
|  | W 2020 | 39/12 | 5.7 | 5.6 | 5.1 | 5.7 | 5.6 | 5.1 |
|  | W 2021 | 37/13 | 5.6 | 5.3 | 5.5 | 5.1 | 5.0 | 5.2 |
| BIOE 485/585 | S 2004 | 15 | ND | ND | ND | ND | ND | ND |
|  | S 2006 | 2 | ND | ND | ND | ND | ND | ND |
|  | S 2007 | 6 | ND | ND | ND | ND | ND | ND |
|  | S 2008 | 10 | ND | ND | ND | ND | ND | ND |
|  | S 2010 | 25 | ND | ND | ND | ND | ND | ND |
|  | S 2012 | 11 | 4.2 | 4.8 | 5.0 | 4.2 | 3.8 | 5.0 |
| BEE 585/586 | F 2016 | 5 | ND | ND | ND | ND | ND | ND |
| BEE 322 | W 2009 | 7 | ND | ND | ND | ND | ND | ND |
| FST 499 | S 2016 | 49/25 | 5.4 | 5.6 | 5.2 | 5.4 | 5.6 | 5.2 |
| Lab |  | 27/18 | 5.5 | 5.6 | 5.2 | 5.5 | 5.6 | 5.2 |
| Lab |  | 22/7 | 5.7 | 5.6 | 5.2 | 5.7 | 5.6 | 5.2 |

N.D., No data; No electronic data available prior to F 2011.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | Instructor Rating\* | | | Course Rating\* | | |
| Course | Term | Enrollment/  Responses | Ind. | BEE | CAS | Ind. | BEE | CAS |
| FST 499 | S 2017 | 47/12 | 5.2 | 5.6 | 5.3 | 5.2 | 5.6 | 5.3 |
| Lab |  | 20/5 | 5.0 | 5.6 | 5.3 | 5.0 | 5.6 | 5.3 |
| Lab |  | 27/7 | 5.3 | 5.6 | 5.1 | 5.3 | 5.6 | 5.1 |
| FST 499 | S 2018 | 29/6 | 5.8 | 5.5 | 5.3 | 5.8 | 5.5 | 5.3 |
| Lab |  | 15/2 | 6.0 | 5.5 | 5.3 | 6.0 | 5.5 | 5.3 |
| Lab |  | 14/4 | 5.5 | 5.5 | 5.3 | 5.5 | 5.5 | 5.3 |
| BEE 399 | S 2017 | 3/0 | ND | ND | ND | ND | ND | ND |
| ENSC 599 | S 2017 | 4/0 | ND | ND | ND | ND | ND | ND |
| BEE 101 | F 2019 | 13/6 | 4.8 | 4.8 | 5.3 | 4.8 | 4.8 | 5.3 |
| Rec |  | 13/6 | 5.1 | 4.8 | 5.3 | 5.1 | 4.8 | 5.3 |
| BEE 101 | F 2020 | 24/9 | 5.2 | 5.4 | 5.5 | 4.9 | 5.1 | 5.2 |
| Rec |  | 24/7 | 4.9 | 5.4 | 5.5 | 4.6 | 5.1 | 5.2 |

#### ND, No Data.

**b. Non-Credit Courses and Workshops**

COBRA Technical Workshop, June 2021, Auckland, NZ

**3. Peer Teaching Evaluations**

Available for FST 499 Advanced Food Processing (Spring 2019)

Available for BEE 473/573 Introduction to Food Engineering Process Design (Winter 2020)

**4. Advising**

I was Head Academic Advisor for the Ecological Engineering Bachelor’s Degree Program for a total of 8 years in two stints. The average amount of time spent for this assignment ranged from 8 h/week during the academic year at the start when student numbers were 5-40 to 20h/week during the academic year with 110 students in the program. Activities included meeting with students, developing programs of study, managing student crises, attending meetings related to policy at the College of Engineering, doing Graduation Audits etc.

**5. Other Assignments**

Collaborative Programs.

#### SCHOLARSHIP AND CREATIVE ACTIVITY

Tabulated Summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time-Frame** | **Refereed Papers** | **Book Chapters** | **Extension Publications** | **Other Peer-Reviewed Materials** |
| **Before promotion** | 7 |  |  | 0 |
| **After Promotion** | 20 |  |  | 7 |
| **Total** | 27 |  |  | 7 |

#### 1. Publications

#### a. Peer Reviewed

#### i. Refereed Papers (27. Total; Google Scholar h Index 20; Citations 1428)

27. Taylor, A.E., Ottoman, C., Chaplen, F.W.R. (2021) Implications of the thermodynamic response of soil mineralization, respiration and nitrification on soil organic matter retention. *Frontiers Microbiol.* 12:651210. 10.3389/fmicb.2021.651210

Role: Performed modeling, helped write and edit the manuscript.

26. Hohenschuh, W., Hector, R.E., Chaplen, F., and Murthy, G.S. (2020) Using high throughput data and dynamic flux balance analysis modeling techniques to identify points of constraint in xylose utilization in Saccharomyces cerevisiae. *Systems Microbiology and Biomanufacturing*. 10.1007/s43393-020-00003-x.

Role: Helped advise student (W. Hohenschuh), helped write and edit earlier versions of the manuscript.

25. Mellbye, B.L., Giguere, A., Murthy, G.S., Bottomley, P.J. Sayavedra-Soto, L.A. and Chaplen F. (2018) Genome-scale, constraints-based modeling of nitrogen oxide fluxesduring co-culture of *Nitrosomonas europaea* and *Nitrobacter winogradskyi*. *mSystems* 3(3): e00170-17. Editor’s Pick.

Role: Advised Post-Doctoral Research Associate (B. Mellbye), developed and funded study, wrote and edited manuscript, performed modeling and experimental work.

24. Mellbye, B.L., Giguere, A., Chaplen, F., Bottomley, P.J., and Sayavedra-Soto, L.S. (2016) Steady-State Growth under Inorganic Carbon Limitation Conditions Increases Energy Consumption for Maintenance and Enhances Nitrous Oxide Production in *Nitrosomonas europaea*. *App. Environ. Microbiol.* 82(11):3310-3318.

Role: Advised Post-Doctoral Research Associate (B.Mellbye) on aspects of the study (maintenance energy), performed experimental work, helped write and edit the manuscript.

23. Juneja, A., Chaplen, F.W.R., and Murthy, G.S. (2016) Genome Scale Metabolic Reconstruction of *Chlorella variabilis* for Exploring Metabolic Potential for Biofuels. *Bioresource Technol.* 213:103-110.

Role: Helped advise student on genome scale model building, edited and helped write the manuscript.

22. Sayavedra-Soto, L., Ferrell, R., Dobie, M., Mellbye, B.L., Chaplen, F.W.R, Buchanan, A., Chang, J., Bottomley, P., Arp, D. (2015) *Nitrobacter winogradskyi* transcriptomic response to low and high ammonium concentrations. *FEMS Microbiology Letters* 362(3):1-7.

Role: Helped analyze data, helped write and edit the manuscript.

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.

Role: Helped analyze data, helped write and edit the manuscript.

20. Avanasi, R.N., Murthy, G.S., Chaplen FWR, and Beatty, C. (2013) Fermentation of glucose/xylose/xyulose in the presence of furfural by yeast for ethanol production. *Biological Engineering Transactions*. 6(3):157-172.

Role: Helped analyze data, helped write and edit the manuscript.

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.

Role: Co-advised student, helped analyze data, drafted and edited manuscript.

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.

Role: Co-advised student, helped analyze data, drafted and edited manuscript.

17. Fan, Y., Xu, S., Schaller, R., Jiao, J., Chaplen, F.W.R., Fern, A. and Liu, H. (2011) Nanoparticle decorated anodes for enhanced current generation in microbial electrochemical cells. *Biosensors and Bioelectronics*, 26:1908-1912*.*

Role: Helped analyze data, helped draft and edit manuscript.

16. 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.

Role: Co-advised student, helped analyze data, draft and edit manuscript.

15. Burrows, E.H., Chaplen, F.W.R. and Ely, R.L. (2008) Optimization of photofermentative hydrogen production by *Synechocystis* sp. PCC 6803. *Int. J. Hydrogen Energy*, 33(21):6092-6099.

Role: Co-advised student, helped analyze data, draft and edit manuscript.

14. Orhanovic, I., Crinon, R.J., Chaplen, F.W.R., Weisshaar, A. (2007) Signal transduction pathway modeling using sequences of chromatophore images. *IEEE Trans Nanobioscience* 6(3):210-218.

Role: Co-advised student, helped analyze data, draft and edit manuscript.

13. Chaplen, F.W.R., Vissvesvaran, G., Henry, E.C. and Jovanovic, G.N. (2007) Improvement of bioactive compound classification through integration of orthogonal cell-based biosensing methods. *Sensors*, 7:38-51.

Role: Co-advised student, helped analyze data, drafted and edited manuscript.

12. MacDonald, M.J., Chaplen F.W., Triplett, C.K., Gong, Q., Drought., H. (2006) Stimulation of insulin release by glyceraldehyde may not be similar to glucose. *Arch Biochem Biophys*, 447(2):118-26.

Role: Advised student, helped analyze data, draft and edit manuscript.

11. Kingkeohoi, S. and Chaplen F.W.R. (2005) Analysis of methylglyoxal metabolism in CHO cells grown in culture. *Cytotechnology*, 48:1-13.

Role: Advised student, helped analyze data, drafted and edited manuscript.

10. Sharma, V., Narayanan, A., Rengachari, T., Temes, G.C., Chaplen, F.W.R. and Moon, U. (2005) A low-cost, portable generic biotoxicity assay for environmental monitoring applications. *Biosensors and Bioelectronics*. 20(11):2218-27.

Role: Co-advised student, helped analyze data, draft and edit manuscript.

9. Clark, K.J,, Chaplin, F.W.R. and Harcum, S.W. (2004) Temperature effects on product quality related enzymes in batch CHO cell cultures producing recombinant tPA. *Biotechnol. Prog.* **20**(6):1888-92.

Role: Co-advised student, helped analyze data, draft and edit manuscript.

8. Van Herreweghe, F., Mao, J., Chaplen, F.W.R., Grooten, J., Gevaert. K., Vandekerckhove, J. and Vancompernolle, K. (2002) Tumor Necrosis Factor-induced modulation of glyoxalase I activities through phosphorylation by PKA results in cell death and is accompanied by the formation of specific methylglyoxal-derived AGEs. *Proc. Natl. Acad. Sci. USA*, 99(2):949-54.

Role: helped analyze data, draft and edit manuscript.

7. Chaplen, F.W.R., Upson, R., McFadden, P.N., Kolodjiez, W.J. (2002) Fish Chromatophores as Cytosensors in a Microscale Device: Detection of Environmental Toxins and Microbial Pathogens. *Pigment Cell Res.* **15**:19-26.

Role: Drafted and Edited manuscript

6. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C. (1998) Evidence of High Levels of Methylglyoxal in Cultured Chinese Hamster Ovary Cells. *Proc. Natl. Acad. Sci. USA*, **95**(10):5533-5538.

Role: Performed experiments. Analyzed data. Drafted and edited manuscript.

5. Chaplen, F.W.R. (1998) Incidence and Potential Implications of the Toxic Metabolite Methylglyoxal in Cell Culture: A Review. *Cytotechnology* 26(3):173-183.

Role: Performed experiments. Analyzed data. Drafted and edited manuscript.

4. Cameron, D.C. and Chaplen F.W.R (1997) Developments in Metabolic Engineering. *Curr Opin Biotechnol* **8**(2):175-180.

Role: Performed experiments. Analyzed data. Drafted and edited manuscript.

3. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C. (1996) Method For Determination of Free Intracellular and Extracellular Methylglyoxal in Animal Cells Grown in Culture. *Anal. Biochem.* **238**:171-178.

Role: Performed experiments. Analyzed data. Drafted and edited manuscript.

2. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C. (1996) Detection of Methylglyoxal as a Degradation Product of DNA and Deoxyribonucleotides Treated with Strong Acid. *Anal. Biochem.* **236**:262‑269.

Role: Performed experiments. Analyzed data. Drafted and edited manuscript.

1. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C. (1996) Effect of Endogenous Methylglyoxal on Chinese Hamster Ovary Cells Grown in Culture. *Cytotechnology* **22**:33-42.

Role: Performed experiments. Analyzed data. Drafted and edited manuscript.

**ii. Juried Exhibits**

Not Applicable

**iii. Book Chapters**

Not Applicable

**iv. Extension Publications**

Not Applicable

**v. Refereed Proceedings**

5. Elsie Weisshaar, Troy Downing, Frank Chaplen. (2021) Denitrifying woodchip bioreactor performance in a Cascadia climate regime *Western Nutrient Management Conference 2021*.

Role: Analyzed data. Edited manuscript.

4. 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)*.

Role: Analyzed data. Drafted and edited manuscript.

3. 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), #1170-R05-13*.*

Role: Analyzed data. Drafted and edited manuscript.

2. T.K.Plant, F.W.R.Chaplen,Goran Jovanovic,Wojtek Kolodziej, Janine E. Trempy, Corwin Willard, James A. Liburdy, Deborah V. Pence, Brian K. Paul (2004) Sensitive-cell-based chromatophore biosensor in *Proceedings Volume 5321, Biomedical Vibrational Spectroscopy and Biohazard Detection*, San Jose, Ca, United States. Doi 10.1117/12.528093.

Role: Analyzed data. Drafted and edited manuscript.

1. Pacut, A., Kolodziej, W., and Chaplen, F..W.R. (2001) Cytosensors for early detection of biological and chemical threats --statistical approach *Proceedings of the 4th International Conference “Neural Networks and Expert Systems in Medicine and Healthcare”*

Role: Analyzed data. Drafted and edited manuscript.

**vi. Abstracts from Conferences without Published Proceedings**

Not Applicable

**b. Other Publications**

Reports

3. Ely, Roger L., & Chaplen, Frank W.R. *Metabolic Engineering of Light and Dark Biochemical Pathways in Wild-Type and Mutant Strains of Synechocystis PCC 6803 for Maximal, 24-Hour Production of Hydrogen Gas*. United States. doi:10.2172/1122862.

2. Kingkeohoi, S. and Chaplen, F.W.R. (2000) Implications of methylglyoxal and glyoxal in pharmaceutical storage buffers. **Report to Schering-Plough Research Institute.**

1. Kingkeohoi, S. and Chaplen, F.W.R. (2000) Design of perfusion culture regimes to minimize toxic metabolite accumulation in NSO cell cultures. **Report to Schering-Plough Research Institute.**

Books

2. Editor, Frontiers in Biology – *Systems Microbiology* Special Issue on modeling response of microbial systems to climate change**.** With Naresh Singhal, Carlo Carere and Laurence Yang, Co-Editors. x2022.

1. Co-Editor, Cell Culture Engineering VI Proceedings, 1998, Published by *Cytotechnology*

Dissertation

1. Chaplen, F.W.R. Characterization of Methylglyoxal Metabolism in Mammalian Cells Grown in Culture. Ph.D. Dissertation, University of Wisconsin-Madison, Madison, Wisconsin, May 1996.
2. **Presentations to Peers**

#### Invited Seminars

2009 Chemical Engineering Department, University of Arkansas, Fayetteville, AK

2007 Food Science and Technology Department, Oregon State University, Corvallis, OR

2001 Bioengineering Department, University of California, San Diego, CA

1998 Biotechnology Laboratory, University of British Columbia, Vancouver, British Columbia, Canada

1. Bioresource Engineering, Oregon State University, Corvallis, OR

Chemical Engineering, Oregon State University, Corvallis, OR

1995 Enology & Viticulture, University of California-Davis, Davis, CA; Chemical Engineering, University of California-Davis, Davis, CA;

1995 Dupont, Inc., Wilmington, DE

1995 Merck, Inc., West Point, PA

1994 Kelco, San Diego, CA

47. Chaplen, F.W.R and Mellbye, B.L. (2018) Incorporation of environmental pH dynamics into an integrative model of a nitrification microcosm co-culture of *Nitrosomonas europaea* and *Nitrobacter winogradskyi*. *5th Conference of Constraint-Based Reconstruction and Analysis,* COBRA 2018, October 15, 2018, Seattle WA.

46. 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.

45. Mellbye, B.L., Giguere, A., Chaplen, F.., Bottomley, P. and Sayavedra-Soto, L. 2015 *Nitrosomonas europaea* responses at suboptimum carbonate levels in continuous culture *ICON4,* Tokyo Japan.

44. Chaplen, F.W.R., Ta, C.T., Higgins, C., Bottomley, P. and Sayavedra-Soto, L. 2015 Constraints-based modeling to elucidate the impacts of environmental dynamics on nitrogen gases production by soil nitrifying bacteria *Nitrosmonas europaea* and *Nitrobacter winogradskyi*. *ACS Natl. Mtg.*, Denver, CO, March 2015.

43. 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.

42. Sayavedra-Soto, L.A., Brett Mellbye, Frank Chaplen, Jeff Chang, Peter J. Bottomley, Daniel J. Arp (2015) Responses of and interactions between nitrifying bacteria to environmental changes: a systems level approach. *Genomic Science Contractors– Grantees Meeting XIII USDA-DOE Plant Feedstock Genomics for Bioenergy Meeting, February 22-25*.

41. 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.

40. 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* grown in chemostat co-culture. *ACS Natl. Mtg.*, Dallas, TX, March 2014.

39. 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.

38. Avanasi, R., Chaplen, F.W.R., Murthy, G.S. 2010. Hemicellulose fermentation by industrial yeast *Saccharomyces cerevisiae*. *ASABE 2010 Meeting*, Pittsburgh, PA, 2010.

37. Avanasi, 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.

36. 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.

35. Chaplen, F.W.R., Xu, S., Fan, Y., Schaller, R., Fern, A., Jiao, J., and Liu H.2010 Microarray studies to elucidate the mechanisms of power transfer at the nanobiological interface in microbial electrochemical cells, *ACS Spring Meeting*, San Francisco, CA

34. Chaplen, F.W.R., Burrows, E.H., and Ely, R.L. 2010 Flux balance analysis of *Synechocystis* sp. PCC 6803 for elucidating hydrogen production, *ACS Spring Meeting*, San Francisco, CA, 2010

33. 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.

32. R. Schaller, Y. Fan, S. Xu, A. Fern, F. Chaplen, H. Liu, and J. Jiao. 2009 Symposium Pacific Northwest Chapter of the American Vacuum Society Science & Technology Society “Nanomodification of Anodes for Power Density Enhancement of Microbial Fuel Cells”,

31. Xu, S., Schaller, R., Fan, Y., Chaplen F. W. R., Jiao, J., and Liu, H. Enhanced performance of microbial electrolysis cells using nanostructure decorated electrodes. 2009. *Proc of 2nd International Microbial Fuel Cell Conference*, June 10-12, Gwangju Institute of Science and Technology(GIST), Republic of Korea.

30. Chaplen, F.W.R., Xu, S., Fan, Y., Schaller, R., Fern, A., Jiao, J., and Liu H. 2009 Elucidating the mechanisms of power transfer at the nanobiological interface in microbial electrochemical cells, *ACS Spring Meeting*, San Francisco, CA

29. Avanasi, R., Murthy, G.S. and Chaplen F.W.R. 2009 Consolidated bioprocessing of corn pericarp using *Eubacterium cellulosolvens*. ASABE 2009, St. Joseph, MI

28. Chaplen, F.W.R., Burrows, E.H., and Ely, R.L. 2008 Analyzing the flux distribution in *Synechocystis* sp. PCC 6803 for improving biosolar hydrogen production. *ACS Spring Meeting* Washington D.C.

27. Chaplen, F.W.R., Burrows, E.H., and Ely, R.L. 2008 Metabolic flux analysis of metabolism in *Synechocystis* sp. PCC 6803 for improving hydrogen production DOE Genomics: GTL Joint Meeting. Bethesda, MD.

26 Yanzhen Fan, Jianfeng Wu, Jun Jiao, Frank Chaplen, Hong Liu.Enhanced Electricity Generation of Microbial Fuel Cells Using Nano-modified Carbon Fiber Electrodes. 11th NSTI Nanotech 2008, Boston Massachusetts, June 1-5, 2008

25. Liu, H., Fern, A., Jiao, J., Chaplen, F.W.R. 2008 Biological Energetics: Nanoenhanced microbial fuel cells for power generation and microscale devices and nanoelectronic applications ONAMI-ARL Conference, February 4 Corvallis, OR

24. Chaplen, F.W.R., Burrows, E.H., and Ely, R.L. 2008 Metabolic flux analysis of metabolism in *Synechocystis* sp. PCC 6803 for improving hydrogen production DOE Genomics: GTL Joint Meeting. Bethesda, MD.

23. Burrows, E.H., Chaplen, F.W.R. and Ely, R.L. 2008 Optimization of photofermentative hydrogen production by *Synechocystis* sp. PCC 6803. DOE Genomics: GTL Joint Meeting. Bethesda, MD.

22. Schrader PS, Burrows EH, Chaplen FWR, and Ely RL. 2007. Metabolic Engineering of Light and Dark Biochemical Pathways in Wild-Type and Mutant *Synechocystis* PCC 6803 Strains for Maximal, 24-Hour Production of Hydrogen Gas. DOE Genomics: GTL Joint Meeting. Bethesda, MD

21. Burrows E, Ely R, and Chaplen F. 2006. Optimization of Cyanobacterial Hydrogen Production. Annual Ecosystem Informatics IGERT Symp. HJ Andrews Exper. Forest, OR.

20. Burrows E, Chaplen F, and Ely R. 2006. Use of response surface methodology in evaluation of hydrogen production by cyanobacteria. NSF IGERT Project Meeting. Arlington, VA.

19. Goran N. Jovanovic, G. Vissvesvaran, Frank W.R. Chaplen(2004) Biosensors: Microscale Design, Testing and Orthogonality. Hemijska industrija, *Chemical Ind.* 58(6a)*.*

18. Vancompernolle, K., Van Herreweghe, F., Chaplen, F., and Vandekerckhove, J. (2003) Metabolism intersects cell death in methylglyoxal: potential role for methylglyoxal as a signaling molecule. *Eur. J. Biochem.* **270**(Supplement 1):127

17. Aramphongphun, C., Upson, R., Chaplen, F.W.R. and Paul, B.K. (2003) Application of Ultrasonic Welding to the Rapid Prototyping of Microfluidic Systems for Biotechnology. *Proceedings of the Society of Industrial Engineers*

16. Mojovic, L., Upson, R., Willard, C., Chaplen, F.W.R, Jovanovic, G.N. (2002) Immobilization of Fish Chromatophores onto Gelatin-based Microcarriers, *Proceedings of the 6th World Congress of Chemical Engineering*, ISBN: 0 7340 2201 8

15. Paul, B.K., Aramphongphun, C., Chaplen F., and Upson, R. (2002) An evaluation of packaging architectures for tissue-based systems. *Trans of NAMRC XXXI, Hamilton, Canada*

14. Kolodziej, W.J., Pacut, A., and Chaplen, F.W.R. (2001) Application of hierarchical fuzzy neural networks to cytosensor information processing. In: *Proceedings of Eighth International Conference on Advances in Communications and Control*, Crete, Greece, June.

13. Bertrand, B., Kolodziej, W.J., and Chaplen, F.W.R., (2001) Adaptive real-time color image segmentation algorithm – case study of toxin biodetector. In: *Proceedings of the IEEE 2001 International Conference on Image Processing*, Thessaloniki, Greece, June.

14. Chaplen, F.W.R., R. H. Upson, B. Kea, C. Carlyle, K. Rorrer, J.E. Trempyand P.N. McFadden (2001) Selection and characterization of a cell-based biosensor system for food and water safety applications. *ACS Div. Biochemical Tech. Mtg*, April.

13. Jovanovic, G.N., Phillip McFadden, Thomas Plant, Brian Paul, Janine Trempy, James Liburdy, Wojtek Kolodziej and Frank Chaplen: Developing Enabling Technologies for Microscale Environmental Sensing Devices. *ACS Div. Biochemical Tech. Mtg*, March 2000.

# 12. Kingkeohoi, S. and Chaplen, F.W.R. Quantitative analysis of methylglyoxal-derived advanced glycation end product (AGE) formation. *Engineering Foundation: Cell Culture Engineering VII*, February, 2000.

11. Triplett, C.K., and Chaplen, F.W.R.: Engineering *Escherichia coli* to provide external indicators of intracellular dynamics. *Engineering Foundation: Metabolic Engineering II*, October 1998.

10. Triplett, C.K. and Chaplen, F.W.R.: Incidence and Implications of the Toxic Metabolite Methylglyoxal in Cell Culture. *IBE Ann. Mtg.*, July, 1998.

9. Chaplen, F.W.R. (1998) Characterization of methylglyoxal metabolism in cultured Chinese hamster ovary cells. *Cell Culture Engineering VI, San Diego*, May 1998.

8. Cameron, D.C. and Chaplen, F.W.R.: Modeling the Fate of Methylglyoxal in Animal Cells Grown in Culture. *Engineering Foundation: Cell Culture VI*, February 1998.

7. Cameron, D.C. and Chaplen, F.W.R.: Development of a flux based model for analyzing methylglyoxal metabolism in mammalian systems*. AIChE Ann. Mtg.*, November, 1997.

6. Triplett, C.K. and Chaplen, F.W.R.: Characterization of methylglyoxal metabolism in Chinese hamster ovary cells grown in batch culture. *AIChE Ann. Mtg.*, November, 1997.

5. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C..: Improving the properties of animal cells used in industrial cell culture: Reducing methylglyoxal accumulation in Chinese hamster ovary cells grown in culture. *Engineering Foundation: rDNA Biotechnology IV*, Oct. 1996.

4. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C.: Impact of endogenous methylglyoxal on Chinese hamster ovary cells grown in culture. *Engineering Foundation: Cell Culture V*, January 1996.

3. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C.: Methylglyoxal metabolism and accumulation in CHO cells grown in culture. *ACS Div. Biochemical Tech. Mtg*, April 1995.

2. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C.: Characterization of methylglyoxal metabolism in Chinese hamster ovary cells grown in culture. *AIChE Ann. Mtg.*, November, 1994.

1. Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C.: Influence of glyoxalase I activity in mammalian cells grown in culture. *AIChE Ann. Mtg.*, November, 1991.
2. **Grant and Contract Support since Promotion to Associate Professor in 2002 only**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Years** | **PIs** | **Agency** | **Title** | **Total** | **To Program** |
| 2001-2004 | G. Temes (PI), W. Kolodziej, F.W.R. Chaplen, U.K. Moon. | Catalyst Foundation | Research on Electronic Cytosensors | $202,105 (No Overhead) | $50,500 |
| 2005-2009 | R. Ely (PI) with Frank Chaplen | Dept. of Energy | 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 | $869,189 | $435,000 |
| 2007-2011 | F.W.R. Chaplen (PI), with H. Liu, J. Jiao, A Fern, and X. Fern | Army Research Laboratory | Biological Energetics: Nanoenhanced microbial fuel cells for power generation and microscale devices and nanoelectronic applications | $500,000 | $125,000 |
| 2010 | F.W.R. Chaplen (PI) with R. Ely, H. Liu and G. Murthy | College of Agricultural Sciences | Strategic Investment Proposal | $34,764 | $8,500 |
| 2012-2016 | F.W.R. Chaplen (PI) with L.A. Sayavedra-Soto | National Science Foundation | EAGER: Development of Multi-Population 13C Isotopic Analyses for Elucidating Intra-Cellular Metabolic Responses within Mixed Populations of Nitrifying Bacteria | $175,004 | $125,000 |
| 2013-2016 | Alan Fern (PI) with Xiaoli Fern. F.W.R. Chaplen and H. Liu Senior Personnel | National Science Foundation | RI: Small: Automated Planning Experiments for Design Optimization | $483,840 | $50,000 |
| 2016-2021 | F.W.R. Chaplen (PI) with Troy Downing | Oregon Dairy Farmer’s Association | Development of Design Tools and Considerations for Increasing the Efficiency of Denitrifying Permeable Reactive Barriers | $205,000 (No over-head OSU Match) | $205,000 |
| 2020-2021 | F.W.R. Chaplen (PI) with Troy Downing | Oregon Department of Agiculture | Development and Testing of Permeable Reactive Barrier (PRB) (Wood-Chip Bioreactor) Technologies for Treatment of Nitrate and Coliform Runoff in Oregon | $78,000 (No over-head OSU Match) | $78,000 |
| 2020-2021 | F.W.R. Chaplen (PI) with Troy Downing | Agricultural Research Foundation | Genomics of a second test permeable reactive barrier (PRB) at the OSU Farm | $15,000 (No overhead) | $15,000 |
| 2017-2022 | Chad Higgins (PI) with G. Characklis, C. Mosley, A. Amos. F.W.R. Chaplen, Senior Personnel | National Science Foundation | INFEWS/T1: Scarcity Amid Abundance: Understanding Trade-Offs in the Food-Energy-Water Nexus in the Willamette River Basin. Role as Co-Chair of INFEWS 2021. | $2.43 million | $40,000 |
| **Total** |  |  |  | **$4,992,852** | **$1,132,000** |

**4. Patent Awards, Patent Applications and Invention Disclosures (4 total).**

4. Invention Disclosure (2020; ID# 20-49). A method and system for eliciting and modulating the likelihood of quantal cybernetical system responses. (2020) Chaplen, F.W.R. Oregon State University. Role: Lead Writer

3. McClelland, P.H., Dunfield, J.S., Upson, R.H. and Chaplen, F., Hewlett Packard Development Co LP, (2006) *Method and device for targeted delivery of materials to selected single cells*. U.S. Patent 7,132,242. Role: Lead Writer

2. Chaplen, F.W., Gerwick, W.H., Jovanovic, G., Kolodziej, W., Liburdy, J., McFadden, P., Paul, B.K., Plant, T.K., Trempy, J.E. and Willard, C., Oregon State University (2005) *Methods for detecting bioactive compounds*. U.S. Patent 6,913,877. Role: Co-Writer

1. Chaplen, F., Gerwick, W., Jovanovic, G., Kolodziej, W., Liburdy, J., McFadden, P., Paul, B., Plant, T., Trempy, J., Roussel, N. and Willard, C. (2005) *Method and system for classifying a scenario*. U.S. Patent Application 10/801,389. Role: Lead Writer

**5. Other information appropriate to the discipline**

**Member:**

American Chemical Society

American Geophysical Union

American Institute of Chemical Engineers

**Professional Development:**

Leadership Development for Executives Program, 2019-2020 Cohort

1. **Service**
2. University service

**Department**

Diversity, Equity, and Inclusion Committee (2020)

Water Quality Engineer Search Committee (2020) Chair

Scholarship Committee, 2019-Present

Ecampus MS in BEE, Program Lead 2018-2019.

Ecological Engineering B.S. (Head Advisor), 2015-17 (100 students)

Ecological Engineering B.S. (Advisor), 2013-2015 (10 students)

Ecological Engineering B.S (Head Advisor), 2007-2013 (4-80 students)

Biological engineering B.S. 1996-1999 (8-10 students)

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

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

Faculty Status Committee, 2009-2011 (Chair)

Graduate Committee, 1996-2009

Scholarship Committee, 1997-2006

Space Committee, 2000-2009.

Bioproducts Engineer Search Committee (Chair), Fall 2006

River Engineer Search Committee, Fall 2005

Bioproducts Engineer Search Committee (Chair), Fall 2005

Bioengineering Search Committee (Chair), Fall 2002

Bioproducts Engineer Search Committee (Chair), Fall 2004

Advisor to prospective undergraduates as part of the SOAP progam, 1997-1998

Whittaker-Funded Bioengineering Faculty Search Committee, Fall 2000

**University Committees**

Food Science & Technology Search Committee, 2022

Climate, Diversity, and Inclusivity Task Force, College of Agricultural Science, 2020-present

Engineering+, College of Engineering, 2019-2021

Engineering+ Implementation Ad hoc Committee Spring 2020

Engineering+ Learning Outcome Ad hoc Committee Winter 2020.

Budget and Finance Committee, 2019-present; Chair 2021-2022

Safety Committee, College of Agricultural Sciences, 2012-2015

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

Curriculum Committee, College of Engineering, 2010-2019; Chair, 2016-2019

Head Advisors Committee, College of Engineering, Fall 2007-2016

Diversity Committee, College of Agriculture Sciences, 2006-2008

Diversity Committee, College of Engineering, 2006-2008

Graduate Committee, College of Engineering 2005-2008

Executive Committee, Microscale Energy and Chemical Systems (MECS), 2000-2005

Internship Committee, College of Engineering, Fall 2000-2004

Scientific Advisory Board to the Center for Gene Research and Biotechnology, 1997-2000

Food Microbiologist Search Committee, Department of Microbiology, Spring 2000

1. Service to the Profession

**National**

NSF Review Panel, 2002

NSF Review Panel, 2003

NSF Review Panel, 2010

NSF Review Panel, 2010

NSF Review Panel, 2011

NSF Review Panel, 2013

NSF Review Panel, 2014

NSF Review Panel, 2016

NSF Review Panel, 2017

NSF Review Panel 1, 2020

NSF Review Panel 2, 2020

NSF Review Panel, 2021

**Conference Leadership**

Advances in Metabolic Engineering, Session 240 (Co-Chair), *AIChE Ann. Mtg.*, San Francisco, CA, November, 1997.

\*Cell Culture Poster Session (Chair), *Engineering Foundation: Cell Culture VI*, San Diego, CA, February 1998.

Metabolic Engineering Poster Session (Co-Chair), *Engineering Foundation: Metabolic Engineering II*, October 1998.

\*Advances in Metabolic Engng (Co-Chair), *ACS Natl. Mtg.*, San Diego, CA, March 1999.

\*Cell Culture Poster Session (Chair), *Engineering Foundation: Cell Culture VII*, Santa Fe, NM, February 2000.

\*Advances in Cell Culture (Co-Chair), *ACS Natl. Mtg.*, San Francisco, CA, March 2000.

\*Advances in Microscale Bioengineering Technology (Co-Chair), *ACS Natl. Mtg.*, San Francisco, CA, March 2000.

Metabolic Engineering Poster Session (Co-Chair), *Engineering Foundation: Metabolic Engineering III*, Colorado Springs, October 2000.

\*Advances in Microscale Bioengineering Tech. (Co-Chair), *ACS Natl. Mtg.*, San Diego, CA, April 2001.

\*Advances and Challenges in Cell Culture Process Development (Co-Chair), *ACS Natl. Mtg.*, San Diego, CA, April 2001.

\*Poster Session, Co-Chair, *ACS Natl. Mtg.*, CA March 2010.

\*Upstream Processes, BIOT Area Coordinator, *ACS Natl. Mtg.*, CA, March 2011.

\*Advances in Cell Culture, Co-Chair, *ACS Natl. Mtg.*, LA April 2013

\*Advances in Systems Biology, Co-Chair, *ACS Natl. Mtg.*, LA March 2014

\*INFEWS 2021, Co-Chair of Workshop, Princeton, NJ, Feb 2022

\* indicates major role in organization

***ad hoc* Reviewer**

**Manuscripts (2-3/Year)**

*Science, Cytotechnology; Biotechnology & Bioengineering; Biotechnology Progress; Trends in Biotechnology; Science; Biosensors and Bioelectronics,Bioresource Technology; International Journal of Hydrogen Energy;*

**Reviewer of Proposals**

*National Science Foundation, Department of Energy, National Institutes of Health,United States Department of Agriculture, Austrian National Science Foundation*

**Reviewer of Books**

*Oxford University Press*

1. Service to the Public

**Presentations**

Chaplen, F.W.R. “Biological Engineering: a new program at OSU”, 1997 and 1998.

(Four presentations to high school advanced placement classes in Portland, OR)

Outreach Activities

**Summer Experience in Science and Engineering for Youth**

This program introduces high-school girls and minority students with high aptitudes for math and science to the field of engineering, and encourages the pursuit of engineering careers. I serve as a mentor to two students every summer and try to budget funds for every NSF grant application I write.

**Saturday Academy**

This program allows high-school students to participate in short- and lon-term internships with scientists and engineers in academia and industry. I served as a mentor to one student each year (1997-2002) and try to budget funds for every NSF grant application I write.

1. **Service to the Public (non-professionally related)**

Ran Troop 3 Christmas Tree Fundraiser 2012-2018. Involved coordinating the activities of 50-60 people aged 6-86.

1. **Service**

During the period 2007-2013 I was Head Academic Advisor, Undergraduate Committee Chair, and Coordinator for ABET Accreditation in the department. My position description for this time is reflective of this service load with approximately 1/3 of my time devoted to these activities. Some metrics associated with this service load include management of a program that grew from 4 to appoximately 80 students; two successful ABET accrediation cycles (2011 and 2014); the maintenance of the program and leading the effort for trhee program revampings; and the successful graduation of approximately 40 students from a new and thriving program. During the period 2015-2017, I was again Head Academic Advisor. My position description for the time is again reflective of this service load with approximately 15% of my time devoted to these activities. The program had grown, now having an enrollment of 110-120 students, but the advising activities were much the same.

1. **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

Proctor-Chevron Academic Scholarship 1987-1988

1. **DIVERSITY, EQUITY, AND INCLUSION**

The killing of George Floyd was an awakening for me as it has been for many in my social group. While committed before to the ideals of diversity, equity, and inclusion, I realize that social justice is a key element of any discussions moving forward. I feel that I have taken concrete actions in the past and will continue to do so moving forward. For example, I worked with Dr. Luhui Whitebear, Assistant Director of Eena Haws, to incorporate an understanding of the cultural and dietary aspects of food preparation to indigenous peoples in the Pacific Northwest into FST 499, Advanced Food Processing, which I taught for three years. More recently, I have started dialogues with colleagues both within and outside of OSU on topics related to race and discrimination. I have also started a Diversity, Equity, and Inclusion book club in the Department of Biological & Ecological Engineering.

As other examples, I set aside time every day to think about the issues associated with diversity, equity, inclusion and social justice. I and others worked hard in a recent search to identify candidates who would increase the diversity of the hiring pool and allow us to address these important issues through inclusive excellence. Many of the individuals and students I have mentored and supervised at the post-doctoral, graduate, undergraduate and high-school levels have been from underrepresented groups in science and engineering as indicated in my CV.

I have a demonstrable commitment to enhancing the educational experiences for members of disadvantaged communities, whose family, economic, and social backgrounds can negatively affect their ability to learn. A significant number of students self-identify to me in my roles as faculty and formally head academic advisor as having issues (related to family situation, domestic violence, first generation to college, transfer status, discrimination) that can potentially affect academic progress and require varying levels of mentoring, advising and support. More formally, I have an active role in the STEM Leadership program. This program promotes the success and retention of first-year and transfer college students with emphases on serving underrepresented groups and disadvantaged students in the sciences and engineering.