

W. Todd French

Mississippi State University • Dave C. Swalm School of Chemical Engineering • P.O. Box 9595
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Professional Activities

Education

Ph.D. – Microbiology (2000), Mississippi State University, Department of Biological Sciences, MS State, MS USA

M.S. – Microbiology (1996), Mississippi State University, Department of Biological Sciences, MS State, MS USA

B.S. – Microbiology (1990), Northeast Louisiana University, Department of Biological Sciences, Monroe, LA USA

Professional Experience

Assistant Professor, Mississippi State University – Dave C. Swalm School of Chemical Engineering (Aug. 2006 - present)

Assistant Research Professor of Microbiology, Mississippi State University – Dave C. Swalm School of Chemical Engineering (2002 – Aug. 2006)

Postdoctoral Research Assistant, Mississippi State University – Department of Biological Sciences (2001 – 2002)

Graduate Research & Teaching Assistant, Mississippi State University – Department of Biological Sciences (1997-2000)

Senior Research Scientist, ASci Corp. (USAE Waterways Experiment Station, Vicksburg, MS) – Fate and Effects Division (1994 – 1997)

Research Activities

Patents

- U.S. Patent Disclosure No. 05-0811-175, filed 10/05
- U.S. Patent Disclosure No. 05-0308-138, filed 4/05
- U.S. Patent Disclosure No. 05-0114-130, filed 3/05
- U.S. Patent No. 7,638,314.

Publications

1. W. T. French*, L. R. Brown, D. N. Downer, H. L. Fredrickson and C. L. Teeter. Effects of n-hexadecane and PM-100 clay on trichloroethylene degradation by *Burkholderia cepacia*. *Journal of Hazardous Material*. 2002. Vol. 92, Issue 1, p. 89-102.
2. R. L. Kuntz, L. R. Brown*, M. E. Zappi and W.T. French. Isopropanol and acetone induces vinyl chloride degradation in *Rhodococcus rhodochrous*. *Journal of Industrial Microbiology and Biotechnology*. 2003. Vol. 30, p. 651-655.

3. G. Zhang, R. E. Rogers*, W. T. French, and W. Lao. Investigation of microbial influences on seafloor gas-hydrate formations. 2007. *Marine Chemistry* Vol. 103, p. 359-369.
4. T. J. Benson, W. E. Holmes, M. G. White, W. T. French, E. G. Alley, and R. Hernandez*. Development of a heterogeneous catalytic cracking reactor utilizing online mass spectrometry analysis. *Journal of Chromatography*. 2007. Vol, 1172, Issue 2; p. 204-8.
5. T. Benson, R. Hernandez*, T. French, E. Alley, and W. Holmes. Reactions of fatty acids in superacid media: Identification of equilibrium products. *Journal of Molecular Catalysis A: Chemical*. 2007. Vol. 274, Issue 1/2; p. 173-178.
6. D. L. Sparks, R. Hernandez*, A. Estevez, N. Meyer, and T. French. Solubility of Azelaic Acid in Supercritical Carbon Dioxide. *Journal of Chemical & Engineering Data*. 2007. Vol. 52, Issue 4; p. 1246-12496.
7. K. A. Taconi*, M. E. Zappi, W. T. French, and L. R. Brown. Feasibility of methanogenic digestion applied to a low pH acetic acid solution. *Bioresource Technology* 2007. Vol. 98, Issue 8; p. 1579-1585
8. S. Dufreche, R. Hernandez*, T. French, D. Sparks, M. Zappi, and E. Alley. Extraction of Lipids from Municipal Wastewater Plant Microorganisms for Production of Biodiesel. 2007. *Journal of American Oil Chemist Society*, Vol. 84, p. 181-187.
9. J. Ford, W. T. French*, R. Hernandez, E. Easterling, M. Zappi, C. Morrison, and L. R. Brown. Development and comparisons of efficient gas-cultivation systems for anaerobic carbon monoxide utilizing microorganisms. *Bioresource Technology*. 2008. Vol. 99, p. 638-643.
10. M. Paraschivescu, E. Alley, W. T. French, R. Hernandez*, and K. Armbrust. Determination of methanol in biodiesel by headspace solid phase microextraction. *Bioresource Technology*, 2008. Vol. 99, p. 5901-5905
11. K. A. Taconi*, M. E. Zappi, W. T. French, and L. R. Brown. Methanogenesis under acidic pH conditions in a semi-continuous reactor system. *Bioresource Technology*, 2008. Vol. 99, p. 8075-8081
12. E. R. Easterling, W. T. French*, R. Hernandez, M. Licha. The effect of glycerol as a sole and secondary substrate on the growth and fatty acid composition of *Rhodotorula glutinis* *Bioresource Technology*, 2009. Vol. 100, Issue 1, p. 356-361.
13. A. Mondala, K. Liang, H. Toghiani, R. Hernandez*, T. French. Biodiesel production by in situ transesterification of municipal primary and secondary sludges. *Bioresource Technology*, 2009. Vol. 100, Issue 3, p. 1203-1210.
14. T. J. Benson, R. Hernandez*, W. T. French, E. G. Alley, W. E. Holmes. Elucidation of the catalytic cracking pathway for unsaturated mono-, di-, and triacylglycerides on solid acid catalysts. *Journal of Molecular Catalysis A: Chemical*, 2009. Volume 303, Issues 1-2; p. 117-123.
15. J. Radich*, R. E. Rogers, W. T. French, and G. Zhang. Biochemical reaction and diffusion in seafloor gas hydrate capillaries: Implications for gas hydrate stability. *Chemical Engineering Science* 2009, Vol. 64(20), p. 4278-4285.
16. E. Revellame, R. *Hernandez, W. T. French, M. White, B. Holmes. Biodiesel from Activated Sludge via *In situ* Transesterification. *Journal of Chemical Technology and*

- Biotechnology* 2010, Vol. 85(5), p. 614-620.
17. Sparks, D.L., L.A. Estévez, R. Hernandez*, J. McEwen, and T. French, 2010, Solubility of Small-Chain Carboxylic Acids in Supercritical Carbon Dioxide,” *Journal Chemical Engineering Data* 2010, Vol. 55, 4922-4927.
 18. G. Zhang, French, WT., Hernandez, R., Alley, E., and Paraschivescu, M., “Effects of furfural and acetic acid on growth and lipid production from glucose and xylose by *Rhodotorula glutinis*,” *Biomass and Bioenergy* 2011, Vol. 35, p. 734-740.
 19. Hall, J. I., Hetrick, M.; French*, W. Todd; Hernandez*, Rafael A.; Donaldson, Janet; Mondala, Andro; Holmes, William. Oil Production by a consortium of oleaginous microorganisms grown on primary effluent wastewater. *Journal of Chemical Technology and Biotechnology* 2011, Vol. 86, p.54-60.
 20. E. Revellame, R. *Hernandez, W. T. *French, B. Holmes and E. Ally. Production of Biodiesel from Wet Activated Sludge. *Journal of Chemical Technology and Biotechnology* 2011, Vol. 86, p.61-68.

Accepted for Publication

1. Mondala, A., R. Hernandez*, J. Hall, W.T. French*, and A. Estevez. Preozonation of primary-treated municipal wastewater for reuse in biofuel feedstock generation. *Environmental Progress & Sustainable Energy*, n/a. doi: 10.1002/ep.10514
2. G. Zhang, T. French*, R. Hernandez*, J. Hall, D. L. Sparks, W. E. Holmes, and E. Alley. Microbial Lipid Production as Biodiesel FeedStock from N-acetylglucosamine by Oleaginous Microorganisms. *Journal of Chemical Technology and Biotechnology*. Accepted on December 28, 2010

Under Review

1. Debarati P., R. Kumar, B. Nanduri, T. French, K. Pendarvis, A. Brown, M. L. Lawrence*, and S. C. Burgess, Proteome and membrane fatty acid composition in *Oligotropha carboxidovorans* OM5 associated with chemolithoautotrophic and heterotrophic environmental conditions. Submitted to *Journal of Bacteriology* on 10/2009.
2. Patrisha J. Pham, Rafael Hernandez, Emmanuel D. Revellame and W. T. French, Activated Sludge Oil: Identification and Characterization of Components, submitted to *Journal of Industrial & Engineering Chemistry Research* on 05/2010.
3. Mondala, A., *Hernandez, R., *French, WT., McFarland, L., and Alley, E., “Lipid accumulation in municipal sewage activated sludge microflora grown on high glucose content synthetic wastewater,” submitted to the *AIChE Journal* on June 16, 2009.

* Denotes Corresponding Author

Advising of Graduate Students

Major Professor

Graduated

1. Emily Easterling, MS Candidate in Department of Biological Sciences, “The Effects of the Secondary Carbon Source Glycerol on the Lipid Accumulation and Fatty Acid Profile of *Rhodotoula glutinis*” Graduated Summer 2007

Current

1. Ben Hartenbauer, MS Candidate in Dave C. Swalm School of Chemical Engineering -Anticipated Graduation Date: Graduating Fall 2010
2. Jaclyn Isonhood Hall, PhD in Dave C. Swalm School of Chemical Engineering – “Growth of Oleaginous Microorganisms on Municipal Sewage” Anticipated Graduation Date: Fall 2010
3. Andrew Ford, MS Candidate in Department of Biological Sciences, “Effect of Lignocellulosic sugars on oil accumulation by an Oleaginous consortium ” Anticipated Graduation Date: Fall 2010

Co-Major Professor

Graduated

1. Jack Ford, MS in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Graduated Summer 2004
2. Christine Morrison, MS in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Graduated Summer 2004
3. Erin Propst, MS Candidate in Department of Biological Sciences, "Media Optimization for the Culturing of Extreme Thermophilic Microorganisms" – Graduated Spring 2005
4. Mary Hetrick, PhD in Department of Biological Sciences, “Selective separation of oleaginous microorganisms using density gradients” Fall 2010

Current

1. Robert McComas MS in Chemical Engineering, Dave C. Swalm School of Chemical Engineering
2. Jen Liu MS in Chemical Engineering, Dave C. Swalm School of Chemical Engineering

Committee Member

Graduated

1. Chandra Kothapalli, MS in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Graduated Summer of 2002
2. Claudia Liu, MS in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Graduated Fall of 2002
3. Michael Begonia, MS in Biological Sciences – Graduated Spring 2003
4. John Sorrell, MS in Biological Sciences – Graduated Fall 2003
5. Charles Zuller, MS in Ag and Bio Engineering – Graduated Spring 2003
6. Katherine Tacconi, Ph.D. in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Graduated Summer 2004
7. Matt Thomas, MS. Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Summer of 2006
8. David Neaves, MS. Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Fall of 2006

9. Jennifer Dearman, Ph.D. Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Spring of 2007
10. Darrell Sparks, PhD. Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Fall of 2007
11. Tracey Benson, PhD. Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Fall of 2007
12. Stephen Dufreche, PhD. Student, "Production of Biodiesel from Wastewater Solids" – Fall 2007
13. James Raddich, MS Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Spring of 2009
14. Shangmin Xiong, MS Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Summer of 2009
15. Scott David Crymble, MS Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering – Spring 2010
16. Dana Miles, PhD Student in Agricultural and Biological Engineering – Summer 2010
17. Andro Mondala, PhD. Candidate Chemical Engineering, Dave C. Swalm School of Chemical Engineering
- 18.

Current

1. Jaricus Whitlock, MS. Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering
2. Emmanuel Revellame, Ph.D. Candidate in Chemical Engineering, Dave C. Swalm School of Chemical Engineering
3. Adebola Coker, Ph.D. Student in Chemical Engineering, Dave C. Swalm School of Chemical Engineering
4. Erick Vasquez, Ph.D. Candidate in Chemical Engineering, Dave C. Swalm School of Chemical Engineering

Research Team Staff

Dr. Guochang Zhang – Assistant Research Professor
 Dr. Earl Alley – Emeritus Professor and Senior Chemist
 Dr. Lynn Prewitt – Assistant Research Professor
 Megan Green – Microbiologist
 Bill Holmes - Chemist

Undergraduate Research Assistants

Magan Tidwell
 Scott Henderson
 Chapel Ford
 Melanie Smith
 Parisa Toghiani
 Philip Jamison
 Steven Garbelet
 Kyle Barfield

Daniel Landrum
 Matt Mistillis
 Brittany Byrnes
 Amanda Novotny
 Rebecca Atkinson
 Jack Carmichael
 Robert Eldridge
 Taylor Raiford

Akshay Gupta
Bonnie O'Neil
Rosemary Weathersby
Jordan Elmore

Caleb Zumbro
Vance Kirk
Scott Alexander

Grants and Contracts

Principal Investigator

1. Continuation Proposal: Mississippi State University Consortium for the Utilization of Biomass – Phase II – U. S. Department of Energy, \$667,000 (Start 07/01/00– End 06/30/07)
 - PI Portions \$667,000
2. Production of Commercial Chemical from Waste Biomass Mississippi Ethanol – Mississippi Ethanol/U. S. Department of Energy, \$889,324 (Start 10/01/03 – End 07/31/07)
 - PI Portions \$889,324
3. Sustainable Energy Research Center- Conversion of Lignocellulosic Biomass to Ethanol Using Novel Processes. Department of Energy, \$1,312,500 Thrust area leader of 12 investigators (Start 02/20/07 – End 03/01/09)
 - PI portion \$246,650
4. An Evaluation of the Feasibility of Combining Carbon Dioxide Flooding Technology with Microbially Enhanced Oil Recovery Technologies in order to Sequester Carbon Dioxide and Simultaneously Increase Oil Recovery – U. S. Department of Energy, \$200,000 (Start 02/20/06 – End 08/19/09)
 - PI portion \$156,036
5. Conversion of Seafood Processing Waste into Triglycerides a Biodiesel Feedstock – MS/AL Sea Grant Consortium, \$170,092 (Start 02/01/08 – End 01/31/10)
 - PI portion \$170,092
6. Sustainable Energy Research Center- Lignocellulosic Conversion. Department of Energy, \$1,300,000 Thrust area leader of 10 investigators (Start 01/01/08 – End 12/31/10)
 - PI portion \$618,288
7. Wastewater to Biofuels. General Atomics (Grant from the US Air Force), \$2,200,000 (Started 07/09-05/11)
 - PI portion \$1,024,055

Co-principal Investigator with Funding

1. Biomass-Based Energy Research - Oklahoma State University/USDA, \$68,127 (Start 07/01/05 – End 06/30/09) Multidisciplinary research project between Ag. and Bio. Engineering, Plant and Soil Sciences, Forrest Products, & Chemical Engineering
 - Co-PI portion \$68,127
2. MICRO-CHP and BIO-FUEL CENTER – U. S. Department of Energy, (Total Project \$1,000,000) (Start 09/14/05 – End 04/14/07) Multidisciplinary research project between Mechanical Engineering, Ag. and Bio. Engineering, & Chemical Engineering

- Co-PI portion \$180,047
- 3. Sustainable Energy Research Center – Biodiesel. \$93,026.00. U.S. Department of Energy. (Start 06/01/06 – End 12/01/08)
 - Co-PI portion \$93,026

Co-principal Investigator without Funding

1. U. S. Department of Energy, Mississippi State Biodiesel Production Project: Development and Optimization of Novel Biodiesel Production Techniques, \$1,231,220 (Start 09/01/2004 - End 09/29/2007)
 - Rafael Hernandez (PI)
 - Todd French (Co-PI)
2. U.S. Environmental Protection Agency, Wastewater Treatment Biorefineries: EPA RARE Grant? – \$200,000 (Start 08/01/2007 - End 07/31/2010)
 - Rafael Hernandez (PI)
 - Todd French (Co-PI)
 - Mark Bricka (Co-PI)
3. U.S. Department of Energy. Sustainable Energy Research Center – Biocrude. \$1,896,381 (Start 01/01/2004 - End 12/31/2010)
 - Rafael Hernandez (PI)
 - Todd French (Co-PI)
 - Sandra Eksioglu (Co-PI)
4. National Science Foundation. 2009 MSU Biofuels Conference. \$10,000 (Start 06/01/2009 - End 11/30/2009)
 - Rafael Hernandez (PI)
 - Todd French (Co-PI)
 - Darrell Sparks (Co-PI)
5. National Science Foundation. Evaluation of Wastewater Containing Lignocellulosic Sugars as a Medium to Grow Oil Accumulating Microbes, \$99,979 (Start 11/01/2008 - End 04/30/2010)
 - Rafael Hernandez (PI)
 - Todd French (Co-PI)
6. National Science Foundation. 2010 MSU Biofuels Conference. \$10,000 (Start 06/01/2010 - End 11/30/2010)
 - Rafael Hernandez (PI)
 - Todd French (Co-PI)
 - Darrell Sparks (Co-PI)

Invited Presentations and Planning Committees

1. DOE Water and Sustainability Road Mapping Meeting, San Diego, CA July 2006
2. LS9, Inc. Invited Seminar, San Jose, CA June 2007
3. Sandia National Laboratory, Invited Seminar, Albuquerque, NM August 2007
4. Jacksonville State University, Anniston, AL September 2007
5. NRRL/AFOSR Algae Road Mapping Meeting, Washington, DC February 2008
6. DOE Algae Road Mapping Meeting, University of Maryland, December 2008

7. South Korean Electronics and Telecommunications National Research Institute, Invited Seminar, Daejeon, South Korea December 2009
8. University of Arkansas, Invited Seminar, Fayetteville, AR March 2010

Presentations

3. T. Benson, M. Zappi, T. French, and R. Hernandez. "Production of Biodiesel from Wastes Associated with Meat Butchering Processes". American Institute for Chemical Engineering Annual Conference, November 2005.
4. S. Dufreche, M. Zappi, T. French, D. Sparks, R. Hernandez, and E. Alley. "Production of a Low Cost Biodiesel Using a Novel Bacterial-Based Feedstock. American Institute for Chemical Engineering Annual Conference, November 2005.
5. *T. French, M. Zappi, R. Hernandez, and E. Easterling. "Extraction and Production of Value-Added Products from Waste Feedstocks. American Institute for Chemical Engineering Annual Conference, November 2005.
6. R. Hernandez, M. Zappi, T. French, J. Whitlock, and E. Alley. "Production of Biodiesel Using an Integrated Extraction/Reaction Process. American Institute for Chemical Engineering Annual Conference, November 2005.
7. *T. French, M. Zappi, E. Easterling, L. Brown, M. Green, and E. Columbus. "Isolation and Optimization of a Microbial Catalyst for the Conversion of Syngas to Ethanol and Acetic Acid. American Institute for Chemical Engineering Annual Conference, November 2005.
8. J. Harden, M. Zappi, T. French, H. Kuo, and W. Kingery. "Optimization of *In situ* Chemical Oxidation Via the Elucidation of Key Mechanistic Processes Impaction Technology Maturation and Development of Effective Application Protocol. American Institute for Chemical Engineering Annual Conference, November 2005.
9. D. Neaves, M. Zappi, R. Hernandez, and T. French. "Impact of Blending Traditional and Non-Traditional Lipid Feedstocks for the Production of Biodiesel. American Institute for Chemical Engineering Annual Conference, November 2005.
10. T. French*, R. Hernandez, M. Zappi, S. Dufreche, and D. Sparks "Production of Biodiesel from Wastewater Treatment Sludges" World Renewable Energy Congress IX, Florence It.
11. Darrell L. Sparks, Rafael Hernandez, Todd French, Hossein Toghiani, Rebecca K. Toghiani, Earl Alley, and Mark E. Zappi. "Supercritical Fluid Oxidation of Oleic Acid. American Institute for Chemical Engineering Annual Conference, November 2006.
12. David E. Neaves, Rafael Hernandez, Todd French, and Mark E. Zappi. "Evaluation of Tall Oil as a Feedstock for the Production of Biodiesel". American Institute for Chemical Engineering Annual Conference, November 2006.
13. Tracy J. Benson, Rafael Hernandez, Todd French, and Mark White. "Cracking of Lipid Molecules by a Superacid". American Institute for Chemical Engineering Annual Conference, November 2006.
14. Rafael Hernandez, Todd French, Stephen Dufreche, Darrell L. Sparks, Hossein Toghiani, Kaiwen Liang, Earl Alley, and Mark E. Zappi. "Production of a Biofuel

- from Sewage Sludge”. American Institute for Chemical Engineering Annual Conference, November 2006.
15. Stephen Dufreche, Rafael Hernandez, Todd French, Mark White, and Mark E. Zappi. “Production of Green Diesel through Catalytic Cracking of Phospholipids” American Institute for Chemical Engineering Annual Conference, November 2006.
 16. Earl Alley, Rafael Hernandez, Todd French, and Jimmie Cain. “Transesterification Rates for Acid Catalyzed Methanolysis of Model Glycerides” American Institute for Chemical Engineering Annual Conference, November 2006.
 17. Emily Easterling, Todd French, Rafael Hernandez, and M. Licha. “Conversion of Glucose, Xylose, and Glycerol by *Rhodotorula Glutinis* into Triglycerides a Biodiesel Feedstock” American Institute for Chemical Engineering Annual Conference, November 2006.
 18. Todd French and Rafael Hernandez 2007. “Production of JP-8 Feedstocks using Wastewater Treatment Infrastructure”. Alternative Energy NOW, February 2007.
 19. Todd French, Rafael Hernandez, Jaclyn Hall, and Andro Mondela 2007. “Wastewater Treatment Facilities: a Novel Biorefinery for the Production of BioCrude” American Oil Chemist Society, May 2007
 20. Jaclyn Hall, Todd French, and Rafael Hernandez 2007 “Cultivating Oleageneous Yeast Using Municipal Wastewater” American Oil Chemist Society, May 2007
 21. Stephen Dufreche, Rafael Hernandez, Bill Holmes, Earl Alley, and Todd French 2007 “Influence of Phosphorous on the Heterogeneous Catalytic Cracking of Phospholipids for Green Diesel Production” American Oil Chemist Society, May 2007
 22. Darrell Sparks, Rafael Hernandez, Antonio Estevez, and Todd French 2007 “Kinetics of Oleic Acid Oxidation in a Supercritical Fluid” American Oil Chemist Society, May 2007
 23. Bill Holmes, Tracey Benson, Rafael Hernandez, Mark White, and Todd French 2007 “Online Mass Spectrometry Analysis of a Catalytic Cracking Reactor” American Oil Chemist Society, May 2007
 24. Todd French and Rafael Hernandez. 2007 “Wastewater Treatment Facilities: Next Generation Biorefineries” CleanTech 2007, June 2007
 25. Robert McComas, Mark Bricka, and Todd French 2007 “Preliminary Investigation Of Cellular Lipid Extraction Using Electroporation As An Enhancement Technique” American Institute for chemical Engineering Annual Conference, November 2007
 26. Andro Mondala, Rafael Hernandez, and Todd French “Ozone Disinfection And Biodegradability Enhancement Of Primary Wastewater Effluent” American Institute for chemical Engineering Annual Conference, November 2007
 27. Earl Alley, Rafael Hernandez, Todd French, Bill Holmes, and Mari Parachevavue “Kinetics Of Transesterification Reactions Of Lipids” American Institute for chemical Engineering Annual Conference, November 2007
 28. Stephen Dufreche, Rafael Hernandez, Todd French, Mark G. White, Earl G. Alley, William E. Holmes Effect of Phosphorus on Acid Cracking of Lipids for the Production of Green Diesel American Institute for chemical Engineering Annual Conference, November 2007

29. Darrell Sparks, Antonio Estevez, Rafael Hernandez, Todd French, and Earl Alley, Synthesis Of Renewable Chemicals From Oleic Acid American Institute for chemical Engineering Annual Conference, November 2007
30. Guochang Zhang, Todd French, Rafael Hernandez, Lynn Prewitt, Lew Brown, and Magan Green, Combining Microbially Enhanced Oil Recovery With CO₂ Sequestration American Institute for chemical Engineering Annual Conference, November 2007
31. Guochang Zhang, Todd French, Rafael Hernandez, Earl Alley, and Bill Holmes Lipid Production From Acid Hydrolysate Of Lignocellulosic Biomass Using Rhodotorula Glutinis American Institute for chemical Engineering Annual Conference, November 2007
32. Jaclyn Hall, Todd French, Rafael Hernandez, Earl Alley, and Bill Holmes, Conversion of Wastewater Treatment Facilities into Biorefineries American Institute for chemical Engineering Annual Conference, November 2007
33. Kaiwen Liang, Rafael Hernandez, Hossein Toghiani, and Todd French Biodiesel From Sewage Sludge American Institute for chemical Engineering Annual Conference, November 2007
34. Tracey Benson, Rafael Hernandez, Mark White, Todd French, Bill Holmes Development Of A Laboratory Scale Catalytic Cracking Reactor American Institute for chemical Engineering Annual Conference, November 2007
35. Tracey Benson, Rafael Hernandez, Mark White, Todd French, Bill Holmes Identification Of The Cracking Mechanism Of Mono-, Di-, And Triglycerides Over H-Zsm-5 Catalyst American Institute for chemical Engineering Annual Conference, November 2007
36. Mondala, A.H., Hernandez, R.A., French, W.T., Alley, E.G., McFarland, L. "Lipid Accumulation in Municipal Wastewater Activated Sludge Microflora using Glucose as Carbon source". Presented at the 52nd Annual Meeting and Technical Conference of Mississippi Water Environment Association (MWEA). Bay, St. Louis, MS, USA. June 2-5, 2009
37. Hall, J.I., French, W.T., Hernandez, R.A., Holmes, W.E., Mondala, A.H. "Wastewater Treatment Facilities – The New Biorefineries". Presented at the 52nd Annual Meeting and Technical Conference of Mississippi Water Environment Association (MWEA). Bay, St. Louis, MS, USA. June 2-5, 2009
38. Benson, T., Hernandez, R., French, W.T., Holmes, W.E., Brown, A. "Identification of Metals Found In Biofuel Lipids Using Inductively Coupled Plasma/Mass Spectrometry". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
39. Benson, T., Hernandez, R., French, W.T., Alley, E., Holmes, W.E. "Product Distribution for Heterogeneous Catalytic Cracking of Acylglycerides on Commercial Catalysts". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.

40. Hall, J., French, W.T., Hernandez, R., Mondala, A., Alley, E., Holmes, W.E., Brown, A., White, M. "Wastewater Treatment Systems: The Next Biorefinery". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
41. Sparks, D.L., Hernandez, R., Estévez, L.A., Holmes, W.E., French, W.T. "Solubility of Small-Chain Fatty Acids In Supercritical Carbon Dioxide". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
42. Ford, A.T., French, W.T., Hernandez, R., Holmes, W.E., Alley, E. "Oil Accumulation by Sewage-Grown Oleaginous Microorganisms". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
43. Dufreche, S., French, W.T., Hernandez, R. "Process and Economic Simulation of Wastewater Plants for Lipid Feedstock Production through Use of Superpro Designer". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
44. Zhang, G., French, W.T., Hernandez, R., Alley, E., Paraschivescu, M.C. "Conversion of Lignocellulosic Sugars to Triacylglycerols: A Renewable Diesel Feedstock". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
45. Mondala, A., Hernandez, R., French, W.T., Alley, E., Paraschivescu, M.C. "Fatty Acid and Lipid Accumulation In Municipal Wastewater Microorganisms Growing on a Nitrogen-Limited Synthetic Wastewater Medium". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
46. Correa-Negrón, F.M., French, W.T., Hernandez, R. "Effect of 1,3-Dimethyl-2-Imidazolidinone in Lipid Production of *Rhodotorula Glutinis*". Presented at the 2008 American Institute of Chemical Engineers (AIChE) Annual Meeting. Loews Philadelphia Hotel, Philadelphia Marriott Downtown & Pennsylvania Convention Center Philadelphia, PA USA. November 16-21, 2008.
47. M. Paraschivescu, E. Alley, R. Hernandez, T. French, and K. Armbrust, "Headspace Solid Phase Microextraction of Methanol in Biodiesel," 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
48. Thomas, R. Hernandez, T. French, E. Alley, and W. Holmes, "Growth of Oleaginous Microorganisms Utilizing Glycerol as the Sole Carbon Source," 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
49. T. French, R. Hernandez, J. Hall, A. Mondala, G. Zhang, B. Holmes, E. Alley, and H. Toghiani, "Conversion of Lignocellulosic Biomass into Triglycerides Using

- Municipal Wastewater Treatment Infrastructure,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
50. Earl G. Alley, Rafael Hernandez, Todd French, Jimmy Cain, and Bill Holmes, “Rates of Homogeneous and Heterogeneous Acid Catalyzed Transesterification Reactions of Tri-, Di- and Mono-Glycerides,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
 51. A. Mondala, R. Hernandez, T. French, L. Estevez, and J. Hall, “Pre-Ozonation of Primary Municipal Wastewater Effluent for the Cultivation of Oleaginous Microorganisms,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
 52. T. Benson, R. Hernandez, T. French, M. White, and W. Holmes, “Elucidation of Mechanism for the Cracking of Unsaturated Lipids Using a Benchmark Catalyst and Commercial Catalysts,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
 53. W. Holmes, T. Benson, T. French, and R. Hernandez, “Evaluation of Mass Spectrometry Analyzers Coupled to an Online Catalytic Cracking System,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
 54. A.T. Ford, W.T. French, R. Hernandez, and B. Holmes, “Oil Accumulation by Sewage-Grown Oleaginous Microorganisms,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
 55. J. Hall, T. French, R. Hernandez, A. Mondala, M. White, B. Holmes, and A. Brown, “Conversion of Wastewater Treatment Facilities into Biorefineries,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
 56. D. Sparks, R. Hernandez, A. Estévez, E. Alley, and T. French, “Utilization of a Supercritical Fluid Medium for the Generation of Renewable Chemicals from Oleic Acid,” 99th American Oil Chemist Society Annual Meeting and Expo, Seattle, WA, 2008.
 57. Cain, J.D., Alley, E.G., Hernandez, R.A., French, W.T., Paraschivescu, M.C., Holmes, W.E. “Rates of Heterogeneous Acid Catalyzed Methanolysis of Trilaurin, Trimyristin, Tripalmitin, Triolein, and Mixed Triglycerides”. Presented at the 100th Annual Meeting & Expo of the American Oil Chemists’ Society (AOCS). Rosen Shingle Creek, Orlando, Florida, USA. May 3-6, 2009.
 58. Revellame, E.D., Hernandez, R.A., French, W.T., Alley, E.G. “Biodiesel from Activated Sludge via in situ Transesterification”. Presented at the 100th Annual Meeting & Expo of the American Oil Chemists’ Society (AOCS). Rosen Shingle Creek, Orlando, Florida, USA. May 3-6, 2009.
 59. Hall, J.I., French, W.T., Hernandez, R.A., Alley, E.G., White, M., Holmes, W.E., Brown, A., Mondala, A.H. “Conversion of Wastewater Treatment Facilities into Biorefineries”. Presented at the 100th Annual Meeting & Expo of the American Oil Chemists’ Society (AOCS). Rosen Shingle Creek, Orlando, Florida, USA. May 3-6, 2009.
 60. Zhang, G., French, W.T., Hernandez, R.A., Paraschivescu, M.C., Alley, E.G. “Microbial Conversion of Seafood Processing Waste into Triglycerides a Biodiesel Feedstock”. Presented at the 100th Annual Meeting & Expo of the American Oil

- Chemists' Society (AOCS). Rosen Shingle Creek, Orlando, Florida, USA. May 3-6, 2009.
61. Sparks, D.L., Hernandez, R.A., Estévez, L.A., French, W.T. "Small-Chain Fatty Acid Solubility in Supercritical Carbon Dioxide". Presented at the 100th Annual Meeting & Expo of the American Oil Chemists' Society (AOCS). Rosen Shingle Creek, Orlando, Florida, USA. May 3-6, 2009.
 62. Mondala, A.H., Hernandez, R.A., French, W.T., Alley, E.G., McFarland, L., Paraschivescu, M.C. "Lipid Accumulation in Municipal Sewage Sludge Microorganisms Growing On a Synthetic Wastewater Medium with Glucose as the Carbon Source". Presented at the 100th Annual Meeting & Expo of the American Oil Chemists' Society (AOCS). Rosen Shingle Creek, Orlando, Florida, USA. May 3-6, 2009.
 63. Thomas, J.M., Hernandez, R.A., French, W.T., Holmes, W.E., Alley, E.G. "Conversion of Glycerol to Lipids via Oleaginous Microorganisms". Presented at the 100th Annual Meeting & Expo of the American Oil Chemists' Society (AOCS). Rosen Shingle Creek, Orlando, Florida, USA. May 3-6, 2009.
 64. Mistilis, Matthew; Hall, Jacqueline; French, W. Todd; Hernandez, Rafael; Holmes, William E.; Mondala, Andro. "Municipal Wastewater: Source of Oil Production." American Institute of Chemical Engineers (AIChE) Annual Meeting, Nashville, TN, November 2009.
 65. Weathersby, Rosemary; Hall, Jacqueline; French, W. Todd; Hernandez, Rafael; Holmes, William E.; Mondala, Andro; Sparks, Darrell. "Wastewater Converted to Biofuel via Oleaginous Microorganism Consortium." American Institute of Chemical Engineers (AIChE) Annual Meeting, Nashville, TN, November 2009.
 66. Raiford, Taylor; Hall, Jacqueline; French, W. Todd; Hernandez, Rafael; Holmes, William E.; Mondala, Andro. "Oil Production for Biofuels via Wastewater Treatment." American Institute of Chemical Engineers (AIChE) Annual Meeting, Nashville, TN, November 2009.
 67. Hall, Jacqueline; French, W. Todd; Hernandez, Rafael; Holmes, William E.; Mondala, Andro. "Conversion of Wastewater Treatment Facilities into Biorefineries." American Institute of Chemical Engineers (AIChE) Annual Meeting, Nashville, TN, November 2009.
 68. Hall, Jacqueline I.; French, W. Todd; Hernandez, Rafael A.; Holmes, William; Sparks, Darrell. "Oil Production for Biofuels via Oleaginous Microorganism Consortium." Poster presentation at the annual conference of American Oil Chemist Society (AOCS), Phoenix, AZ, May 15-19, 2010
 69. Weathersby, Rosemary; Hall, Jacqueline I.; French, W. Todd; Hernandez, Rafael A.; Holmes, William; Sparks, Darrell. "Wastewater Converted to Biofuel via Oleaginous Microorganism Consortium." Poster presentation at the Annual Mississippi State University Undergraduate Research Symposium, Mississippi State, MS, April 22, 2010.
 70. Barfield, Kyle; Hall, Jacqueline I.; French, W. Todd; Hernandez, Rafael A.; Holmes, William; Sparks, Darrell. "Oil Production for Biofuels via Oleaginous Microorganism Consortium." Poster presentation at the Annual Mississippi State

- University Undergraduate Research Symposium, Mississippi State, MS, April 22, 2010.
71. Mistilis, Matthew; Hall, Jacqueline I.; French, W. Todd; Hernandez, Rafael A.; Donaldson, Janet; Hetrick, Mary; Holmes, William; Sparks, Darrell. "Municipal Wastewater: Source of Oil Production." Poster presentation at the Annual Mississippi State University Undergraduate Research Symposium, Mississippi State, MS, April 22, 2010.
 72. Weathersby, Rosemary; Hall, Jacqueline I.; French, W. Todd; Hernandez, Rafael A.; Holmes, William; Sparks, Darrell. "Wastewater Converted to Biofuel via Oleaginous Microorganism Consortium." Poster presentation at the 9th annual Southern Bioproducts & Renewable Energy Conference, Tunica, MS, April 13-14, 2010
 73. Barfield, Kyle; Hall, Jacqueline I.; French, W. Todd; Hernandez, Rafael A.; Holmes, William; Sparks, Darrell. "Oil Production for Biofuels via Oleaginous Microorganism Consortium." Poster presentation at the 9th annual Southern Bioproducts & Renewable Energy Conference, Tunica, MS, April 13-14, 2010
 74. French, Todd; Hernandez, Rafael; Zhang, Guochang; Holmes, Bill; Alley, Earl. Conversion of N-acetylglucosamine into lipids: Bio-derived diesel feedstock. Abstracts, Joint 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, LA, United States, December 1-4 (2010)
 75. Coker, Adebola; Iretski, Alexei; White, Mark; Hernandez, Rafael; French, Todd. Effect of water on base-catalyzed transesterification of soybean oil with methanol over promoted hydrotalcite catalysts. Abstracts of Papers, 239th ACS National Meeting, San Francisco, CA, United States, March 21-25, 2010 (2010)
 76. Adebola T. Coker¹, Alexei V. Iretskii², Rafael Hernandez¹, Mark G. White¹ and Todd French¹. Effect of Water On Esterification of Palmitic Acid Using ZSM-5 and Faujasite Zeolite Catalysts 2010 AIChE Annual Meeting, Salt Lake City, UT
 77. Patrisha J. Pham¹, Rafael Hernandez¹, Benjamin Estill², Andro H. Mondala¹ and William T. French¹. A Spectrophotometric Method for Quantitative Determination of Xylose In Fermentation Medium. 2010 AIChE Annual Meeting, Salt Lake City, UT
 78. Patrisha J. Pham¹, Rafael Hernandez¹, Dyane Marie Acevedo Vélez² and William T. French¹. Transesterification of Activated Sludge Oil by Ionic Liquid Supported Acid Catalysis. 2010 AIChE Annual Meeting, Salt Lake City, UT
 79. Patrisha J. Pham, Rafael Hernandez, Emmanuel D. Revellame and William T. French. Activated Sludge Oil: Identification and Characterization of Components. 2010 AIChE Annual Meeting, Salt Lake City, UT
 80. Andro Mondala¹, Rafael Hernandez¹, W. Todd French¹, Jorge Santo Domingo², Hodon Ryu², Linda McFarland¹ and Brandon Iker. Lipid Accumulation Kinetics and Microbial Community Analysis of Activated Sludge Microbiota. 2010 AIChE Annual Meeting, Salt Lake City, UT
 81. Láder Lerma-Caicedo¹, L. Antonio Estévez¹, Rafael Hernandez², Todd French² and William Holmes³. Phase Diagram of Two Ternary Systems Water + Triacetin + Alkane by a Novel Experimental Technique. 2010 AIChE Annual Meeting, Salt Lake City, UT

82. Emmanuel D. Revellame¹, Rafael Hernandez², W. Todd French³, Earl G. Alley⁴ and William E. Holmes⁴. The Conversion of Lipids Derived From Activated Sludge Into Biofuels. 2010 AIChE Annual Meeting, Salt Lake City, UT
83. Rafael Hernandez¹, Mark White², William French², Adebola Coker² and Alexei V. Iretski. In-Situ Biodiesel Production From Microbial Lipids Using Supercritical Methanol. 2010 AIChE Annual Meeting, Salt Lake City, UT

International Collaborations

- Invited by Dr. Simone Graeff to Participated with the University of Hohenheim on 2 European Union Grant Proposals
- Hosted Dr. Yolanda Gonzalez from the University of Guadalajara to work on converting distillery wastewater into triglycerides using oleaginous microorganisms
- Hosted Dr. Javlon Tashpulatov from Institute of microbiology, Tashkent, Uzbekistan and two of his colleagues to work on wastewater to biofuels concept

Honors and Awards

Sigma Xi New Investigator Research Award 2007

Membership in Professional Organizations

American Society for Microbiology (1989)

South Central Branch of the American Society for Microbiology (1990)

Society for Industrial Microbiology (1990)

American Oil Chemist Society (2006)

American Water Resources Association (1999)

American Institute of Chemical Engineers (2002)

American Society for Engineering Educators (2002)

Water Environment Federation (1999)

Teaching Activities at Mississippi State University

Teaching Philosophy

My philosophy on teaching is to make the material as exciting and fun as possible so as to encourage assimilation of the material and eventual utilization. Students are encouraged to participate during lectures and ask questions. Participation is encouraged through quizzes, in class problems, and direct questions. Based on the students' responses to these an understanding of how well the material is being assimilated. This allows for the material to be represented in a different manner. Based on the feedback from the students the interactive method is very effective and appreciated.

Student Evaluation

CHE 4673/6673 - Industrial Microbiology Spring 2005 –4.36/5.00

CHE 8011 – Graduate Seminar Fall 2005

CHE 8011 – Graduate Seminar Spring 2006

CHE 1101 – Freshman Seminar Fall 2006
CHE 2114 – Mass and Energy Balances (Co-Taught with Dr. Hernandez) Spring 2007
CHE 1101 – Freshman Seminar Fall 2007 – 4.0/5.0
CHE 4673/6673 - Industrial Microbiology Fall 2007 – 4.5/5.00
CHE 2114 – Mass and Energy Balances Spring 2008 – 4.4/5.0
CHE 1101 – Freshman Seminar Fall 2008
CHE 2114 – Mass and Energy Balances Fall 2008 4.4/5.0
CHE 2114 – Mass and Energy Balances Spring 2009 4.1/5.0
CHE 4673/6673 – Industrial Microbiology Spring 2010 4.7/5.0
CHE 2114 – Mass and Energy Balances Fall 2010 4.3/5.0

Educational Training

Attended the 2007 Chemical Engineering Summer School at Washington State University
Attended the SuperPro Designer Software training at Purdue University in 2006

Service Activities

Activities within Professional Organizations

1. President of Sigma Xi Mississippi State University Chapter, July 1, 2004 to June 30, 2005
2. Past-President of Sigma Xi Mississippi State University Chapter, July 1, 2005 to June 30, 2006
3. Session Co-Chair at the American Institute for Chemical Engineering Annual Conference, Cincinnati, OH November 2005
4. Session Co-Chair at the Southern Bioproducts Meeting, Philadelphia, MS April 2006
5. Session Co-Chair at the American Oil Chemist Society Quebec, Canada May 2007
6. Co-Organizer of the 2nd MSU Biofuels Workshop
7. Session Co-Chair at the American Oil Chemist Society Seattle, WA May 2008
8. Technical Organizing Committee for CleanTech 2008 Boston, MA

Departmental and College Committees

Graduate Advisor Committee (Fall 2006-Present)

College of Engineering Committee for Developing Strategic Plan for Research (Summer 2009 – Present)

Member of the Environmental Certificate Committee (Fall 2009-Present)

Technical Reviewer for

Journal of Bacteriology

Journal of Hazardous Materials

Ground Water

European Journal of Lipids

Bioresource Technology

Simulation Modelling Practice and Theory

Separation Science and Technology

Industrial and Engineering Chemistry Research
Biochemical Engineering Journal
Journal of Industrial Microbiology
Environmental Technology
New Biotechnology
Applied Microbiology and Biotechnology
Alabama Academy of Sciences
United States Environmental Protection Agency
Louisiana's EPSCoR Office
US Department of Energy
National Renewable Energy Laboratory SBIR Program

Advisory Board Membership

Member of the Scientific Advisory Board for Pasteuria Biosciences INC., Alachua, FL since 2004.

Southeastern SunGrant University of Tennessee, Since 2011