CURRICULUM VITA

BRIAN H. DAVISON

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RESEARCH INTERESTS

Bioconversion of Renewable Resources into Fuels and Chemicals (ethanol, organic acids, solvents), Systems Analysis of Microbes (Cultivation and Proteomics), Non-Aqueous Biocatalysis, Biofiltration of VOCs, Bioremediation of Chlorinated Organics, Bioreactor Modeling (Mass Transfer and Kinetics), Immobilization of Microbes and Enzymes, Biosorption of Metals, Extractive Fermentations.

PROFESSIONAL EXPERIENCE

Oak Ridge National Laboratory, Chief Scientist for Systems Biology and Biotechnology, 2006–Present

Lead Lab-wide initiatives in Systems Biology and in Bioenergy. Serve as Science Coordinator for integration for the BioEnergy Science Center, www.bioenergyscience.org. Coordinated successful proposals for the Bioenergy Science Center. Manage internal investment portfolio and develop new programs, staff and teams in these focus areas. Research in biomass conversion, microbial cultivation and nonaqueous enzymes. Co-developed technology in catalytic upgrading of ethanol into hydrocarbons, which is licensed to Vertimass. Chief Scientist for Genomic Sciences for the U.S. DOE Biological and Environmental Research Office (2009–2011). Serve as Chair of the Institutional Biosafety Committee since 2001.

Oak Ridge National Laboratory, Director, Life Sciences Division, 2004–2005

Management of active research division consisting of 100 staff members in addition to students and subcontractors. Continued research while assisting multiple initiatives for genomics, national biosecurity, and sensors.

Oak Ridge National Laboratory, Senior Biochemical Engineer and Group Leader, 1995–2001,
Distinguished Researcher and BioChemical Engineering Research Group Leader, 2002–2003

Research and Development (R&D) activities expanded in areas listed with programmatic responsibilities, supervision, and support of 5 to 15 research staff members including postdocs, technicians, and students. Managed more than ten research projects. Project Team Leader of the Alternative Feedstocks Program which involved coordination for interdisciplinary multilab teams with industrial partners for demonstration of an economic process to convert renewables into commodity chemicals (i.e., succinic acid). Other projects include: nonaqueous biocatalysis, biofiltration and ethanol fermentation with experimental planning and modeling. Served as Co-Chair of the 15th to 26th *Symposia on Biotechnology for Fuels and Chemicals*. Assisted in several lab-wide initiatives (e.g., Bioenergy/Bioproducts, chemical warfare decontamination, biological CO_2 sequestration). Operated a 500-L fermentor as Manager for ORNL's Bioprocessing User Facility 1992–2003.

Oak Ridge National Laboratory, Biochemical Engineer II, 1990–1995

R&D on bioprocessing with increased supervisory duties. Projects included immobilized-cell bioreactors, extractive fermentation of butanol, biomethanogenesis, conversion of wastepaper, and collaborations with outside researchers and private industry. Assisted in the development of a predictive model for the fluidized-

bed bioreactor. Responsible for interface of research and maintenance staff in preparation for major external Environmental Safety and Health inspection while serving as Local Facility Supervisor for two years.

Oak Ridge National Laboratory, Biochemical Engineer I, 1985–1990

Research emphasized experiments and modeling of immobilized-cell fluidized-bed bioreactors. Designed and tested bioreactors for ethanol production and for simultaneous fermentation and separation of organic acids. This included scale-up (to a 10-ft column) and the use of industrial feedstocks.

University of Tennessee-Knoxville, Adjunct Professor of Chemical Engineering, 1988–Present

Instructor of graduate courses in Biochemical Engineering including supervision of one Ph.D. student and four Masters students.

EDUCATION

Ph.D. Chemical Engineering, California Institute of Technology, Pasadena, California, 1985.
Thesis topic: "*Dynamics and Coexistence of Mixed Microbial Cultures.*" Stable coexistence of competing microorganisms (*E. coli* and *S. cerevisiae*) in chemostats.
Thesis Advisor: Dr. Gregory N. Stephanopoulos

B.S.E. Chemical Engineering, with honors, University of Rochester, Rochester, New York, 1979.

AWARDS and HONORS

Fellow, American Institute of Chemical Engineers (AIChE), 2016.
Secretary of Energy's Honor Achievement Award for "The WIPP Technical Assessment Team (TAT) and Accident Investigation Board (AIB)," 2015.
UT-Battelle Science Communicator of the Year, ORNL, 2010.
Charles D Scott Award for distinguished contributions to the field of biotechnology for fuels and chemicals, Society for Industrial Microbiology, Symposium on Biotechnology for Fuels and Chemicals, 2006.
College of Fellows, American Institute for Medical and Biological Engineering (AIMBE), 2006.
R&D100 Award for "Production of Chemicals from Biologically Derived Succinic Acid," *Research & Development Magazine*, 1997.
Management Achievement Award, Life Sciences Division, ORNL, 2002.
Significant Event Award for "Expression of Lignin Peroxidase in Yeast," ORNL, 2000.
Significant Event Award for "Dry Enzyme Catalysis," ORNL, 2000.
Technology Maturation Award for Succinic Acid Process, ORNL, 1999.
Technical Achievement Award for "Innovative Research Leading to the Development of the Biparticle Fluidized-Bed Bioreactor," Martin Marietta Energy Systems, Inc., 1992.
Distinguished Writing Award for Scholarly Articles (First place) by the Society for Technical Communication - East Tennessee, 1991.
Significant Event Award for "High Productivity, Ethanol Fermentation," Martin Marietta Energy Systems, Inc., 1987.
Outstanding Graduating Engineer, University of Rochester, 1979.
Wilson Scholar, University of Rochester, 1975–1979.
AIChE Outstanding Junior Chemical Engineer, University of Rochester, 1978.
National Merit Scholarship, 1975.

PROFESSIONAL AFFILIATIONS

American Institute of Chemical Engineers: Fellow (chaired symposia and sessions) Society for Biological Engineering Board of Directors (2012–2016).
American Chemical Society (chaired symposia and sessions and served on several BIOT committees).
Society for Industrial Microbiology.
Chair, Symposium on Biotechnology for Fuels and Chemicals and editor of the Proceedings in *Appl. Biochem. Biotechnol*, (1994–2005). Organizing Committee (2006–2012). The Symposium grew from 150 to 400 attendees during my twelve years as chair.
Editorial Board: *J. Industrial Biotechnology* (2011–Present).
Advisory boards: NSERC Bioconversion Network for Guelph and Univ. British Columbia (2009–2015).
BBSRC Sustainable Bioenergy Centre (BSBEC), United Kingdom (2010–2015).
C3 Bio EFRC, Purdue University (2012–on).
Southeast Agriculture and Forestry Energy Resources Alliance (2007–2010).
Co-Organizer for the USDOE "Biomass to Biofuels" Workshop, December 2005. "Breaking the Biological Barriers to Cellulosic Ethanol," DOE/SC-0095.
Participant in "Microbial Production of Energy" Colloquium, March 10–12, 2006, San Francisco, California. Report by American Academy of Microbiology.

PUBLICATIONS (Including Book Chapters)

Lepore, A. W., L. Zhenglong, B. H. Davison, and C. K. Narula, "Catalytic Dehydration of Biomass Derived 1-Propanol to Propene over M-ZSM-5 (M=H, V, Cu, or Zn) and γ-alumina: A Comparison," *ACS Catalysis* (awaiting publication, 2016).

Dumitrache, A., D. M. Klingeman, J. M. Natzke, M. Rodriguez, Jr., R. J. Giannone, R. L. Hettich, B. H. Davison, and S. D. Brown, "Significant Gene Expression Differences in *Clostridium thermocellum* Biofilm and Planktonic Cell," *Proceedings of the National Academy of Sciences* (awaiting publication).

Pingali, S. V., V. S. Urban, W. T. Heller, J. McGaughey, H. O'Neill, M. Foston, H. Li, C. E. Wyman, D. A. Myles, P. Langan, A. Ragauskas, B. Davison, and B. R. Evans, "Understanding Multiscale Structural Changes During Dilute Acid Pretreatment of Switchgrass and Poplar," *ACS Sustainable Chemistry & Engineering* (awaiting publication).

Herring, C. D., W. R. Kenealy, A. J. Shaw, S. F. Covalla, D. G. Olson, J. Zhang, W. R. Sillers, V. Tsakraklides, J. S. Bardsley, S. R. Rogers, P. G. Thorne, J. P. Johnson, A. Foster, I. D. Shikhare, D. M. Klingeman, S. D. Brown, B. H. Davison, L. R. Lynd, and D. A. Hogsett, "Strain and Bioprocess Improvement of a Thermophilic Anaerobe for the Production of Ethanol from Wood," *Biotechnol. for Biofuels* **9**:125 (2016); DOI: 10.1186/S13068-016-0536-8.

Dumitrache, A., J. M. Natzke, M. Rodriguez, Jr., K. L. Yee, O. A. Thompson, C. R. Poovaiah, S. Hui, M. Mazarei, H. L. Baxter, N. L. Engle, C. Fu, Z.-Y. Wang, A. K. Biswal, G. Li, Y. Tang, T. J. Tschaplinski, N. C. Stewart, R. Dixon, R. S. Nelson, D. A. Mohnen, J. R. Mielenz, S. D. Brown, and B. H. Davison, "Transgenic Switchgrass (*Panicum virgatum* L.) with Reduced Recalcitrance to Bioconversion: A Two-Year Comparative Analysis of Five Different Types of Transgenes in the Field," *Bioresource Technology* (awaiting publication).

Passian, A., R. H. Farahi, and B. H. Davison, "Optonanomechanical Spectroscopic Imaging," *Imaging & Microscopy* (2016); http://www.imaging-git.com/science/scanning-probe-microscopy/optonanomechanical-spectroscopic-imaging.

Davison, B. H. and J. Lievense, "Technology Challenges and Opportunities in Commercializing Industrial Biotechnology," *Chem. Eng. Prog*. **112**(6):35 (2016).

Paye, J. M. D., A. Guseva, S. K. Hammer, E. Gjersing, M. F. Davis, B. H. Davison, J. Olstad, B. S. Donohoe, T. Y. Nguyen, C. E. Wyman, S. Pattathil, M. G. Hahn, and L. R. Lynd, "Biological Lignocellulose Solubilization: Comparative Evaluation of Biocatalysts and Enhancement via Cotreatment," *Biotechnol. for Biofuels* **9**:8 (2016); DOI: 10.1186/s13068-015-0412-y.

Dumitrache, A., H. Akinosho, M. Rodriguez, Jr., X. Meng, C. Yoo, J. Natzke, N. Engle, R. Sykes, T. Tschaplinski, W. Muchero, A. Ragauskas, S. Brown, and B. Davison, "Consolidated Bioprocessing of *Populus* Using *Clostridium thermocellum*: A Case Study on Lignin Composition and Structure," *Biotechnology for Biofuels* **9**:31 (2016); DOI: 10.1186/s13068-016-0445-x.

Passian, A., R. H. Farahi, and B. H. Davison, "Exploring the Nano-World of Plant Cells with Hybrid Photonic-Mechanical Forces," *In Focus* **40**:4–9 (2015).

Sander, K., C. M. Wilson, M. Rodriguez, Jr., D. M. Klingeman, T. Rydzak, B. H. Davison, and S. Brown, "*Clostridium thermocellum* DSM 1313 Transcriptional Responses to Redox Perturbation," *Biotechnol. for Biofuels* **8**:211 (2015); DOI: 10.1186/s13068-015-0394–9.

O'Neill, H., R. Shah, B. R. Evans, J. He, S. V. Pingali, S. P. S. Chundawat, A. D. Jones, P. Langan, B. H. Davison, and V. Urban, "Chapter Six - Production of Bacterial Cellulose with Controlled Deuterium–Hydrogen Substitution for Neutron Scattering Studies," *Methods in Enzymology* **565**:123–146 (2015).

Narula, C. K., Z. Li, E. M. Casbeer, R. A. Gieger, M. Moses-DeBusk, M. Keller, M. V. Buchanan, and B. H. Davison, "Heterobimetallic Zeolite InV-Zsm-5, Enables Efficient Conversion of Biomass Derived Ethanol to Renewable Hydrocarbons," *Scientific Reports* **5**:16039 (2015); DOI: 10.1038/srep16039.

Currie, D. H., B. Raman, C. M. Gowen, T. J. Tschaplinski, M. L. Land, S. D. Brown, S. F. Covalla, D. M. Klingeman, Z. K. Yang, N. L. Engle, C. M. Johnson, M. Rodriguez, A. J. Shaw, W. R. Kenealy, L. R. Lynd, S. S. Fong, J. R. Mielenz, B. H. Davison, D. A. Hogsett, and C. D. Herring, "Genome-Scale Resources for *Thermoanaerobacterium saccharolyticum*," *BMC Systems Biology* **9**:30 (2015); DOI: 10.1186/s12918-015-0159-x.

Tetard, L, A. Passian, R. H. Farahi, T. Thundat, and B. H. Davison "Opto-Nanomechanical Spectroscopic Material Characterization," *Nature Nanotechnol*. **10**:870–877 (2015); DOI: 10.1038/nnano.2015.168.

Davison, B. H., C. C. Brandt, A. M. Guss, U. C. Kalluri, A. V. Palumbo, R. L. Stouder, and E. G. Webb, "The Impact of Biotechnological Advances on the Future of U.S. Bioenergy," *Biofuels, Bioprod. Biorefin.* **9**:454–467 (2015); DOI: 10.1002/bbb.

Slater, S. C., B. A. Simmons, T. S. Rogers, M. F. Phillips, K. Nordahl, and B. H. Davison, "The DOE Bioenergy Research Centers: History, Operations, and Scientific Output," *Bioenerg. Res.* **8**(3):881–896 (2015); DOI: 10.1007/s12155-015-9660-8.

Yee, K. L., M. Rodriguez, Jr., C. Y. Hamilton, S. D. Hamilton-Brehm, O. A. Thompson, J. G. Elkins, B. H. Davison, and J. R. Mielenz, "Fermentation of Dilute Acid Pretreated *Populus* by *Clostridium thermocellum*, *Caldicellulosiruptor bescii*, and *Caldicellulosiruptor obsidiansi*," *Bioenerg. Res.* **8**(3):1014–1021 (2015); DOI: 10.1007/s12155-015-965.

Evans, B. R., G. Bali, M. Foston, A. J. Ragauskas, H. O'Neill, R. Shah, J. McGaughey, D. Reeves, C. Rempe, and B. H. Davison, "Production of Deuterated Switchgrass by Hydroponic Cultivation," *Planta* **242**:215–222 (2015); DOI: 10.1007/s00425-015-2298-0.

Baxter, H. L., C. R. Poovaiah, K. L. Yee, M. Mazarei, M. Rodriguez, Jr., O. A. Thompson, H. Shen, G. B. Turner, S. R. Decker, R. W. Sykes, F. Chen, M. F. Davis, J. R. Mielenz, B. H. Davison, R. A. Dixon, C. N. Stewart, Jr., "Field Evaluation of Transgenic Switchgrass Plants Overexpressing *PvMYB4* for Reduced Biomass Recalcitrance," *Bioenerg. Res.* **8**(3):910–921 (2015); DOI: 10.1007/s12155-014-9570-1.

Kalluri, U. C., H. Yin, X. Yang, and B. H. Davision, "Systems and Synthetic Biology Approaches to Alter Plant Cell Walls and Reduce Biomass Recalcitrance," *Plant Biotechnol. J.* **12**:1207–1216 (2014); DOI: 10.1111/pbi.12283.

Zaharov, V. V., R. H. Farahi, P. J. Snyder, B. H. Davison, and A. Passian, "Karhunen-Loeve Treatment to Remove Noise and Facilitate Data Analysis in Sensing, Spectroscopy and Other Applications," *Analyst* **139**:5928–5936 (2014); DOI: 10.1039/C4AN01300J.

Ragauskas, A. J., G. T. Beckham, M. J. Biddy, R. Chandra, F. Chen, M. F. Davis, B. H. Davison, R. A. Dixon, P. Gilna, M. Keller, P. Langan, A. K. Naskar, J. N. Saddler, T. J. Tschaplinski, G. A. Tuskan, and C. E. Wyman, "Lignin Valorization: Improving Lignin Processing in the Biorefinery," *Science* **344**:709+ (2014); DOI: 10.1126/science.1246843.

Lee, Kelsey L., M. Rodriguez, Jr., O. A. Thompson, C. Fu, Z.-Y. Wang, B. H. Davison, J. R. Mielenz, "Consolidated Bioprocessing of Transgenic Switchgrass by an Engineered and Evolved *Clostridium thermocellum* Strain," *Biotechnology for Biofuels* **7**:75 (2014); DOI: 10.1186/1754-6834-7-75.

Yang, S., C. Pan, G. B. Hurst, L. Dice, B. H. Davison, and S. D. Brown, "Elucidation of *Zymomonas mobilis* Physiology and Stress Responses by Quantitative Proteomics and Transcriptomics," *Front. Microbiol.* **5**, Article 246 (2014); DOI: 10.3389/fmicb.2014.00246.

Pingali, S. V., H. M. O'Neill, L. He, Y. Nishiyama, Y. Melnichenko, V. S. Urban, B. H. Davison, and P. Langan, "Morphological Changes in the Cellulose and Lignin Components of Biomass Occur at Different Stages During Steam Pretreatment," *Cellulose* **21**(2):873–878 (2014); DOI: 0.1007/s10570-013-0162-6.

He, J., S. V. Pingali, S. P. S. Chundawat, A. Pack, A. D. Jones, P. Langan, B. H. Davison, V. Urban, B. Evans, and H. O'Neill, "Controlled Incorporation of Deuterium into Bacterial Cellulose," *Cellulose* **21**(2):927–936 (2014); DOI: 10.1007/s10570-013-0067-4.

Sangha, A. K., R. F. Standaert, B. H. Davison, M. F. Davis, J. C. Smith, and J. M. Parks, "Chemical Factors that Control Lignin Polymerization," *Journal of Physical Chemistry Part B: Biophysical Chemistry, Biomaterials, Liquids, and Soft Matter* **118**:164–170 (2014); DOI: 10.1021/jp411998t.

Langan, P., L. Petridis, H. M. O'Neill, S. V. Pingali, M. Foston, Y. Nishiyama, R. Schulz, B. Lindner, B. L. Hanson, S. Harton, W. T. Heller, V. Urban, B. R. Evans, S. Gnanakaran, A. J. Ragauskas, J. C. Smith, and B. H. Davison "Common Processes Driving the Thermochemical Pretreatment of Lignocellulosic Biomass," *Green Chemistry* **16**:63–68 (2014); DOI:10.1039/C3GC41962B.

Yang, S., C. Pan, T. J. Tschaplinski, G. B. Hurst, N. L. Engle, W. Zhou, P. A. Dam, Y. Xu, M. Rodriguez, Jr., L. Dice, C. M. Johnson, B. H. Davison, and S. D. Brown, "Systems Biology Analysis of *Zymomonas mobilis* ZM4 Ethanol Stress Responses," *PLoS ONE* **7**(8):e68886 (2013); DOI: 10.1371/journal.pone.0068886.

Brown, S. D., D. M. Klingeman, C. M. Johnson, A. Clum, A. Aerts, A. Salamov, A. Sharma, M. Zane, K. Barry, I. V. Grigoriev, B. H. Davison, L. R. Lynd, P. Gilna, H. Hau, D. A. Hogsett, and A. C. Froehlich, "Genome Sequences of Industrially Relevant *Saccharomyces cerevisiae* Strain M3707, Isolated from a Sample of Distillers Yeast and Four Haploid Derivatives," *ASM Genome Announcements* **1**(3):e00323-13 (2013); DOI: 10.1128/genomeA.00323-13.

Pu, Y., F. Hu, F. Huang, B. H. Davison, and A. J. Ragauskas, "Assessing the Molecular Structure Basis for Biomass Recalcitrance During Dilute Acid and Hydrothermal Pretreatments," *Biotechnol. for Biofuels* **6**:15 (2013); DOI: 10.1186/1754-6834-6-15.

Davison, B. H., J. Parks, M. F. Davis and B. S. Donohoe, "Plant Cell Walls: Basics of Structure, Chemistry, Accessibility and the Influence on Conversion," Chap. 3 in *Aqueous Pretreatment of Plant Biomass for Biological and Chemical Conversion to Fuels and Chemicals*, C. E. Wyman, Editor, John Wiley & Sons, Ltd. (2013).

Tschaplinski, T. J., R. F. Standaert, N. L. Engle, M. Z. Martin, A. K. Sangha, J. M. Parks, J. C. Smith, R. Samuel, N. Jiang, Y. Pu, A. J. Ragauskas, C. Y. Hamilton, C. Fu, Z.-Y. Wang, B. H. Davison, R. A. Dixon, and J. R. Mielenz, "Down-Regulation of the Caffeic Acid *O*-Methyltransferase Gene in Switchgrass Reveals a Novel Monolignol Analog," *Biotechnol. for Biofuels* **5**:71 (2012); http://www.biotechnologyforbiofuels.com/content/5/1/71.

Langan, P., B. R. Evans, M. Foston, W. T. Heller, H. M. O'Neill, L. Petridis, S. V. Pingali, A. J. Ragauskas, J. C. Smith, V. S. Urban, B. H. Davison, "Neutron Technologies for Bioenergy Research," *Industrial Biotechnol.* **8**(4):209–216 (2012); DOI: 10.1089/ind.2012.0012.

Tetard, L., A. Passian, S. Jung, A. J. Ragauskas, and B. H. Davison. "Development of New Methods in Scanning Probe Microscopy for Lignocellulosic Biomass Characterization," *Industrial Biotechnol.* **8**:245–249 (2012); DOI: 10.1089/ind.2012.0017.

Davison, B. H., "Overview: The Increasing Importance and Capabilities of Biomass Characterization," *Industrial Biotechnology* **8**:189–190 (2012); DOI: 10.1089/ind.20121527.

Tetard, L., A. Passian, R. H. Farahi, B. H. Davison, S. Jung, A. J. Ragauskas, A. L. Lereu and T. Thundat, "Nanometrology of Delignified *Populus* Using Mode Synthesizing Atomic Force Microscopy," *Nanotechnology* **22**:465702 **(**2011); DOI: 10.1088/0957-4484/22/46/465702.

Tetard, L, A. Passian, R. H. Farahi, B. H. Davison, A. L. Lereu, and T, Thundat, "Optical and Plasmonic Spectroscopy with Cantilever Shaped Materials," *J. Phys. D: Appl. Phys.* **44**:445102 (2011); DOI: 10.1088.0022-3727/44/44/445102.

Studer, M. E., J. D. DeMartini, M. F. Davis, R. W. Sykes, B. H. Davison, M. Keller, G. A. Tuskan, and C. E. Wyman, "Lignin Content in Natural *Populus* Variants Affects Sugar Release," *PNAS* **108**:6300–6305 (2011); DOI: 10.1073/pnas.100925210.

Davison, B., T. Donohue, P. Gilna J. D. Keasling, and Y. Heather, "Commentary: Q&A Roundtable on U.S. Bioenergy Research," *Industrial Biotechnology* **7**(4):264–266 (2011); DOI: 10.1089/ind.2011.7.264.

Tetard, L, A. Passian, R. H. Farahi, B. H. Davison, and T. Thundat, "Optomechanical Spectroscopy with Broadband Interferometric and Quantum Cascade Laser Sources," *Optics Letters* **36**:3251–3253 (2011).

Mohnen, D., A. Biswal, H. Zhangying, S. Tipton, G.-A. Ivana, et al., "The Bioenergy Science Center (BESC) and Overcoming Recalcitrance of *Populus* to Biofuel Production," *In Vitro Cellular & Developmental Biology-Animal* **46**(1 Supplement):48–48 (2010).

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Pu, Y. Q., F. Chen, A. Ziebell, B. H. Davison, A. J. Ragauskas, "NMR Characterization of C3H and HCT Down-Regulated Alfalfa Lignin," *Bioenergy Res.* **2**:198–208 (2009); DOI: 10.1007/s12155-9056-8.

Kim, S., T. Rahman, L. R. Senesac, B. H. Davison, and T. Thundat. "Piezoresistive Cantilever Array Sensor for Consolidated Bioprocess Monitoring," *SCANNING* **31**:204–210 (2009); DOI: 10.1002/sca.20159.

Borole, A. P., C. Y. Hamilton, T. A. Vishnivetskaya, D. Leak, C. Andras, J. Morrell-Falvey, B. H. Davison, and M. Keller, "Integrating Engineering Design Improvements with Exoelectrogen Enrichment Process to Increase Power Output from Microbial Fuel Cells," *J. Power. Sources* **191***:*520–527 (2009); DOI: 10.1016/j.jpowsour.2009.02.006.

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Cole, K., B. Dale, B. Davison, B. Erickson, and M. Parr, "Possible Impacts of the US EPA Notice of Proposed Rulemaking on the Biofuels Industry," *Industrial Biotechnol.* **4**(4):322–333 (2009).

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Lynd, L. R., M. S. Laser, D. Bransby, B. E. Dale, B. Davison, R. Hamilton, M. Himmel, M. Keller, J. D. McMillan, J. Sheehan, and C. E. Wyman, "How Biotech Can Transform Biofuels," *Nature Biotechnology* **26**(2):169–172 (2008).

Borole, A. P. and B. H. Davison. "Techno-Economic Analysis of Biocatalytic Processes for Production of Alkene Epoxides," *Applied Biochem. Biotechnol.* **137**:437–449 (2007).

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INVITED PANELS (SELECTED) AND RESULTING ROADMAPS IF AVAILABLE

Co-Organizer

USDOE "Biomass to Biofuels" Workshop, December 2005, "Breaking the Biological Barriers to Cellulosic Ethanol," DOE/SC-0095.

"New Biocatalysts: Essential Tools for a Sustainable 21st Century Chemical Industry," Council for Chemical Research and USDOE OIT, Palo Alto, California, November 16–18, 1999.

Organizing Committee/Session/Breakout Chair

"Vision 2020: 2000 Separations Roadmap," AIChE Center for Waste Reduction Technologies and USDOE (2000).

"Alternative Feedstocks Program Technical and Economic Assessment: Thermal/chemical and Bioprocessing Components," USDOE OIT, July 1993.

"The Technology Roadmap for Plant/crop-based Renewable Resources 2020," National Corn Growers Association and USDOE-OIT, 2/1999, DOE/GO-10999-706.

"DOE Genomics:GTL Roadmap – Systems Biology and the Environment," DOE/SC-0090, August 2005.

"Systems Biology Knowledgebase for a New Era in Biology – A Genomics:GTL Report from the May 2008 Workshop," DOE/SC-0113.

"New Frontiers in Characterizing Biological Systems – Report from the May 2009 Workshop," DOE/SC-0121.

"DOE Systems Biology Knowledgebase Implementation Plan – From the Knowledgebase System Development Workshop, June 13, 2010, in Crystal City, Virginia," September 2010.

Participant

"DOE Bioproducts to Enable Biofuels Workshop," Westminster, Colorado, July 2015, DOE/EE-1294 December 2015.

"DOE-OBP: Workshop on Conversion Technologies for Advanced Biofuels," Arlington, Virginia, December 6–8, 2011.

"Microbial Energy Conversion," American Academy of Microbiology, workshop March 2006.

"National Algal Biofuels Technology Roadmap – National Algal Biofuels Workshop, December 2008," May 2010, DOE/EE-0332.

Review panels for USDA, SBIR, NSF Biocatalysis (December 2012), and DOE (BETO, BER, EPSCOR).

STUDENTS

5 Years: Ph.D.: Kyle Sanders, Andrew LePore, Riddhi Shah
Past: MS: C. L. Cheng, Greg DeLozier, Paula A. Cameron, Miguel Rodriguez, Jr.
Ph.D.: Mai Y. Sun

Post-Degrees Studies

5 Years: Kelsey Yee, Erik Casbeer, and Zhenglong Li,
Past: John W. Barton, Ping Wang, Laurel O'Connor, Manesh S. Krishnan

RECENT SELECTED INVITED PRESENTATIONS (2010–PRESENT)

"Neutron Scattering and Simulation Provide Insights into Fundamental Mechanisms of Biomass Pretreatment," DOE-BER Genomic Sciences Meeting, March 2016.

"Commercializing Industrial Biotechnology – Closing Summary of the State of the Field," Co-Chair: Commercializing Industrial Biotechnology Workshop – Society of Biological Engineering, San Diego, California, September 28–29, 2015.

"Dynamics and Coexistence in Applied Biochemical Engineering," session in honor of 65th birthday of Gregory Stephanopoulos, AICHE Annual Meeting, Salt Lake City, November 2015.

"Biorefineries and Bioconversions: Current and Future Challenges," plenary talk for the International Bioenergy Conference, Manchester, United Kingdom, March 11–13, 2014.

"Strategies for Increased Bio-Based Fuels – Biotechnology and Recalcitrance," plenary talk for Section 15c, AIChE Annual Meeting, Atlanta, Georgia, November 2014.

"Bioconversion Challenges and Opportunities," NSERC Bioconversion Network Enzyme Hydrolysis Workshop and 5th AGM, Montreal, Canada, June 2–4, 2014.

"DOE Bioenergy Research Center Achievement and Technology Transfer," 11th World Congress on Industrial Biotechnology, Philadelphia, Pennsylvania, May 12–15, 2014.

"Bioconversion Challenges and Opportunities," NSERC Bioconversion Network Enzyme Hydrolysis Workshop and 5th AGM, Montreal, Canada, June 2–4, 2014.

"Strategies for Increased Bio-Based Fuels - with a Focus on Biotechnology Solutions to Recalcitrance," BSRI 2014 Annual Retreat, "The Future of Bioenergy," Athens, Georgia, May 2, 2014.

"Metabolic and Process Engineering in Industrial Scale-up of Biobased Products," 11th World Congress on Industrial Biotechnology, Philadelphia, Pennsylvania, May 12–15, 2014.

"Existing Challenges and the Future of Bioenergy and Bioproducts Development in Canada," FIBRE Conference Cornwall, Ontario, Canada, June 2013.

"The Promise and Progress of University Bioenergy Research" 2012 Georgia Energy Solutions for the Southeast Meeting, Tifton, Georgia, November 29, 2012.

"Bioconversion" NSERC AGM and Pretreatment Workshop, Vancouver, B.C., Canada, June 4–6, 2012.

"Progress of Research in Bioenergy Centers: an update on the major DOE and other Bioenergy Research Centers," Bioenergy BIO International Convention, June 27–30, 2011, Washington, D.C.

"Overcoming Biomass Recalcitrance," Oklahoma ESPCoR Annual State Conference, University of Oklahoma, Norman, Oklahoma, April 29, 2010.

"Advances in Conversion and Sustainability at BESC – A DOE Bioenergy Research Center," 6th World Congress on Industrial Biotechnology and Bioprocessing, Montreal, Canada, July 19–22, 2009.

PAST SELECTED INVITED PRESENTATIONS (1999–PRESENT)

"BioEnergy Science Center" in "Developing a Cellulosic Biofuels Industry: The Tennessee Biofuels Initiative," BIO Pacific Rim Summit, November 11–16, 2007, Honolulu, Hawaii.

"BioEnergy Science Center: Initial Results in Overcoming Biomass Recalcitrance," BIOMASS 2009: Fueling Our Future, National Harbor, Maryland, March 17–18, 2009.

"Structural Understanding of Key Physical Properties in the Pretreatment and Enzyme Hydrolysis of Biomass," AIChE Annual Meeting, San Francisco, California, November 2013.

"Strategies to Generate Biofuels from Cellulosic Biomass by Overcoming Recalcitrance at the BioEnergy Science Center," AIChE Annual Meeting, San Francisco, California, November 2013.

By invitation of the Ministry of Science and Technology – P.R. China, "Integrated Bioproducts and Separations," International High Level Forum on Bioeconomy, Beijing, China, September 14–16, 2005.

Davison, B. H., "Nontraditional Biocatalysis," BIO 2001, Annual Meeting of the Biotechnology Industry Organization, San Diego, California, June 24–27, 2001.

Davison, B. H., A. Mulchandani, A. Borole, C. Cheng, and M. Rodriguez, Jr., "Perixodase-Catalyzed Epoxidation of Alkenes," 221st ACS National Meeting, American Chemical Society, San Diego, California, April 1–5, 2000.

Nghiem, N. P., M. I. Donnelly, and B. H. Davison, "Production of Succinic Acid from Lignocellulosic Materials," 221st ACS National Meeting, American Chemical Society, San Diego, California, April 1–5, 2001.

Davison, B. H., J. W. Barton, T. K. Klasson, and L. E. O'Connor, "Removal and Destruction of CWA Simulants Using 'Dry' Enzyme-Impregnated Fabrics and Coatings," Booz-Allen & Hamilton, Inc., International Symposium on Applications of Enzymes in Chemical and Biological Defense, Orlando, Florida, May 13, 2001.

Davison, B. H., J. W. Barton, A. B. Francisco, and K. T. Klasson, "The Effect of Biomass on the Measured Solubility of Sparingly Soluble Organics in Aqueous Bioremediation Systems," 2000 USC-TRG Conference on Biofiltration, Los Angeles, California, October 18–20, 2000.

Nghiem, N. P., B. H. Davison, and T. M. Cofer, "Comparison of Ethanol Production from Lignocellulosic Sugars by Two Chromosomally Integrated Microbial Strains in a Fluidized-Bed Reactor," 23rd Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, Colorado, May 6–9, 2001.

Davison, B. H., T. Kuritz, and C. K. McKeown, "Green Biopolymer for Decon of Contaminated Surfaces," Presentation at *Decontamination, Demolition and Restoration (DD&R) Topical Meeting on Site Restoration of Government and Commercial Facilities*, Knoxville, Tennessee, September 12–16, 1999.

Davison, B. H., T. Kuritz, J. W. Barton, and C. K. McKeown, "Green Biopolymers for Decontamination of Metals from Surfaces," oral and poster presentation at AEMSP Review Meeting, Atlanta, Georgia, April 2000.

Davison, B. H., T. Kuritz, C. K. McKeown, and J. W. Barton, "Green Biopolymer Coatings for Improved Decontamination of Metals from Surfaces," Platform presentation at 13th Annual Technical Information Exchange (TIE) Workshop, Albuquerque, New Mexico, November 13–15, 2001.