



Pacific Northwest
NATIONAL LABORATORY

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Chemical and Biological
Process Development Group

STAFF DIRECTORY



August 2011

PNNL-SA-82041

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Scientist

karl.albrecht@pnnl.gov

Phone: (509) 371-6775

Fax: (509) 372-4732

Karl Albrecht

Karl Albrecht joined PNNL in 2009 after graduating from Iowa State University where he completed his graduate work under Brent Shanks and Thomas Wheelock. Since joining PNNL, he has been involved in a number of diverse projects focused on the catalytic production of fuels and chemicals from biorenewables. He has experience in catalyst screening and characterization, reactor design and implementation as well as the development and analysis of kinetic and thermodynamic models.

Research Interests

- Fuels and chemicals from biorenewables via thermochemical processes
- High throughput catalyst discovery and development
- Catalyst characterization
- Reactor design and reaction kinetics analysis

Education

- Ph.D. Chemical Engineering, Iowa State University
- B.S. Chemical Engineering, University of Nebraska – Lincoln



Project Manager

dan.anderson@pnnl.gov

Phone: (509) 375-4406

Fax: (509) 372-6421

Daniel Anderson

Dan Anderson is senior management and technology development professional with thirty years of experience spanning a wide range of technologies, and roles including: principal investigator (scientist/engineer), program/project manager, line manager, product development manager, technology commercialization manager, and operations manager.

Research Interests

- Biochemical Conversion
- Thermochemical Conversion
- Microalgae Production and Processing

Education

- M.S. Biological Sciences, Washington State University
- B.S. Molecular and Cellular Biology, University of Washington



Scientist

Deanna.Auberry@pnnl.gov

Phone: (509) 375-6530

Deanna Auberry

Ms. Auberry has been with PNNL since 2000. Her work in the Fungal Biotechnology Group makes use of her prior experience in microbial systems to enable studies of both fungi and algae using mass spectrometry based proteomics. Other past projects have also included the design and implementation of a laboratory information management system (LIMS) to track and report data for the Genomes to Life (GtL) project.

In addition to her extensive experience in preparing biological samples for ESI-LC-MS/MS, she also has expertise in the analysis of proteomics data, and is able to utilize her skills with relational databases, statistical software, and data visualization methods to bring new insights into fungal systems.

Research Interests

- Fungal and algal proteomics

Education

- MS in Chemistry from Purdue University
- BA in Chemistry from University of Tennessee at Chattanooga



Scientist

scott.baker@pnnl.gov

Phone: (509) 372-4759

Fax: (509) 372-4732

Scott Baker

Scott Baker is primarily involved in research using genetic, genomic and proteomic strategies to understand important problems in fungal biology. Before joining PNNL in 2003, Dr. Baker studied epithelial cell adhesion in mammalian cell and tissue culture. Further study included cell adhesion in a genetic system, i.e., the fruitfly, *Drosophila melanogaster*. Dr. Baker's experience also includes work at the Torrey Mesa Research Institute/Syngenta, where he was a member of a team that took a genomics-based approach to the study of fungal plant pathogens. When TMRI was sold to Diversa, a biotech company, he continued to work on fungal genomics, but with an industrial emphasis.

Education

- Ph.D., Cell and Molecular Biology, Northwestern University, 1996
- BS, Biology, cum laude, Oregon State University, 1992



Heather Brown

Heather Brown joined PNNL's Chemical and Biological Process Development Group as a research chemist, in December of 2005. Originally hired to maintain various analytical instruments, she now manages the Combinatorial High Throughput Laboratory. The combinatorial laboratory is a unique capability which allows for rapid screening of catalysts and reaction processes. Ms. Brown utilizes her chemical, analytical, and programming experience to coordinate work-flows for a wide variety of projects, primarily in the field of biomass utilization. Her and her team provide experimental design, execution, data processing, and reporting as part of the combinatorial service center. Ms. Brown handles all cost accounting and scheduling for the service center.

Scientist

heather.brown@pnnl.gov

Phone: (509) 375-4529

Fax: (509) 375-4732

Research Interests

- Discovering solutions to energy and environmental issues.
- Creating practical robotics procedures for wet chemistry, catalyst preparation, and reaction process screening techniques.
- Developing novel programs, protocols, and data visualization for data sets.

Education

- Bachelor of Science in Chemistry, Suma Cum Laude- Washington State University



Kenneth Bruno

Kenneth S. Bruno first gained experience with the molecular and cellular biology of filamentous fungi as an undergraduate at Texas A&M University. This work included the study of nuclear distribution and morphological mutants of *Neurospora crassa*. His thesis work at Purdue University involved the examination of regulatory pathways that control septation in *Aspergillus nidulans*. He continued as a postdoctoral fellow at Purdue for two years gaining experience studying the fungal plant pathogen *Magnaporthe grisea*. Ken joined the staff in the Fungal Biotechnology group at PNNL in June of 2005.

Education

- Ph.D., Biology, Purdue University
- B.S., Microbiology, Texas A&M University

Scientist

bruno@pnnl.gov

Phone: (509) 375-4438

Fax: call for fax



Mark Butcher

Mr. Butcher joined Battelle in 1991 and is currently serving as a Senior Research Scientist on the Fungal Biotechnology Research Team of the Chemical and Biological Process Development Group. He is providing technical and management support to fungal biotechnology projects, which are focused on developing and improving biotechnology for production of biofuels and other bioproducts. His contributions include providing project and lab space management, input for proposals, technical publications and client reports, and making technical presentations. His business development responsibilities include sales and marketing, client relationship management, and conference exhibit management. Past accomplishments include co-inventing multiple-electrode corona discharge reactors for the treatment of aqueous wastes, co-designing micro-cell systems for testing liquid/liquid and gas/liquid separation technologies, designing bench-scale wastewater treatment reactors, and providing technical support to numerous bioremediation projects for soil and water contaminated with various chlorinated solvents, heavy metals, nitrate, and JP-4 fuel.

Scientist

mark.butcher@pnnl.gov

Phone: (509) 375-6894

Fax: (509) 372-4732

Research Interests

- Biotechnology for production of biofuels and other value-added bioproducts
- Bioremediation technology for contaminated soil and water

Education

- M.B.A./T.M., (Master of Business Administration/Technology Management), University of Phoenix
- B.A., Physical Geography (Geology minor), Eastern Washington University
-



James Collett

Jim Collett is a molecular biologist who combines computational and experimental approaches for metabolic engineering and systems biology research. His work includes simulations of intracellular metabolic networks, analysis of genomic data from massively parallel DNA sequencing, and fermentation studies of industrial microbes for the production of biofuels and bioproducts. Dr. Collett joined PNNL in 2006 as a Systems Biology Postdoctoral Fellow in the Fundamental and Computational Sciences Directorate, where he developed database tools and reagents for antibody microarrays used in assays of clinical and environmental biomarkers. At the University of Texas at Austin, he developed the first high-throughput methods for the production and processing of RNA aptamer microarrays for the specific detection of proteins in complex fluids. His previous experience also includes programming and maintaining process control systems, networks, and enterprise data servers in the water and wastewater utilities industry. Dr. Collett also served in the United States Navy as a telecommunications officer in support of Sixth Fleet operations in the Mediterranean Sea.

Engineer

james.collett@pnnl.gov

Phone: (509) 372-6345

Fax: call for fax

Education

- Systems Biology Postdoctoral Fellowship, Pacific Northwest National Laboratory
- University of Texas at Austin, Ph.D. Molecular Biology
- University of Texas at Austin, M.A. Biological Sciences
- Texas A&M University, B.S. Geography



Scientist

Alan.Cooper@pnnl.gov

Phone: (509) 375-6884

Fax: call for fax

Alan Cooper

Alan Cooper has been with PNNL since 2005 working on a variety of projects related to catalysis and the conversion of renewable feedstock to fuels and chemicals. He has worked extensively on combinatorial catalysis and has experience with batch reactors as well as lab-scale continuous flow reactors.

Research Interests

- Catalysis and reaction engineering
- Fuels from biomass and renewable feedstock
- Reduction of environmental emissions and waste streams
- Chemical processes that produce higher-value chemical intermediates from synthesis gases, sugars, and oils.

Education

- B.S. Chemistry, Washington State University



Scientist

david.culley@pnnl.gov

Phone: (509) 375-2236

Fax: (509) 372-4732

Davie Culley

Dave Culley has over 20 years laboratory research experience in the genetics, molecular biology and biochemistry of organisms ranging from archeal bacteria to higher plants. His research projects currently focus on the genetics and biochemistry of filamentous fungi as related to conversion of cellulosic biomass to advanced biofuels or commodity chemicals.

He has authored or co-authored more than 50 publications, including journal articles, review articles, book chapters, conference proceedings and technical reports. Dr. Culley originally joined PNNL in 2003 as part of the Environmental Microbiology group and transferred to the Fungal Biotechnology team in the Chemical & Biological Process Development Group in 2008.

Research Interests

- Biochemical and biological conversion of cellulosic biomass to advanced biofuels.
- Genome based investigations of the metabolic capabilities of filamentous fungi.
- Biochemistry and bioenergetics of pentose sugar utilization in fungi.
- Genetics and biochemistry of secondary metabolite production.
- Evolved associations between photosynthetic organisms and heterotrophic fungi.

Education

- Ph.D. Plant Physiology and Plant Breeding, University of Minnesota
- B.A. Biology, University of California, Santa Cruz



Ziyu Dai

Ziyu Dai concentrates his work in the area of the molecular biology and biotechnology of eukaryotic systems. He is currently applying his expertise to research on filamentous fungi to develop biobased technology and products, and is heading the fungal genetics component of the Lab's Bio-based Products Initiative. Dr. Dai's diverse experience includes the isolation, analysis, and manipulation of genes. He has isolated a series of eukaryotic genes and examined their functions and regulations in the eukaryotic systems. This work has resulted in two issued patents and five pending patents. Dr. Dai has also studied the transgenic expression of various proteins in green plants, including the expression of various microbial cellulase enzymes and human blood proteins in tobacco and potato plants. He has published extensively in the area of molecular biology, biochemistry, and physiology of green plants.

Scientist

ziyu.dai@pnnl.gov

Phone: (509) 375-2169

Fax: (509) 372-4732

Education

- Ph.D., Botany, Washington State University
- M.S., Agronomy, Southern China Agricultural University
- B.S., Agronomy, Southern China Agricultural University



Shuang Deng

Dr. Deng has over 14 years of experience in molecular biology. Dr. Deng got her Ph.D degree from Department of Biochemistry & Molecular Genetics in University of Alabama at Birmingham in 2004. Her thesis work studied bacterial chromosome structure, dynamics, gene regulation and functional genomics in *Escherichia coli* and *Salmonella typhimurium*. Dr. Deng joined PNNL in 2006 after working for two years as research associate at University of Alabama at Birmingham.

Research Interests

- Utilizing filamentous fungi for converting renewable biomass to fuels, chemicals and enzymes.
- Discovery of genes important for biosynthetic pathways.
- Strain improvement with higher productivity and the use of alternative substrates, which may reduce costs and conserve environment.

Education

- Ph.D., Biochemistry and Molecular Genetics, University of Alabama at Birmingham
- M.S., Clinical Pharmacology, Sun Yat-sen University
- B.S., Clinical Medicine, Zhengzhou University

Scientist

shuang.deng@pnnl.gov

Phone: (509) 375-4526

Fax: (509) 372-4732



George Deverman

George Deverman has more than 35 years of experience in chemical process operation and development including 17 years with the Dow Chemical Company, in manufacturing and R&D, and 20 years with Battelle at Battelle Columbus Operations and PNNL. He has design and operation experience with a wide range of chemical processes including polymer extrusion, hydrothermal, catalytic flow-through, fluidized bed, and supercritical fluid systems for manufacture of nanoparticles. His contributions include designs for a wide range of process equipment from reactors and mixers, control valves, and specialized feeders to modular test facilities.

Research Interests

- Process development for manufacture of particles from solution under hydrothermal and supercritical fluid conditions.
- Development of high-volume/high-temperature explosion-proof heaters for process gas injection.
- Development of powder and particle dispensing valves/mixers for gas and vapor phase reactors.

Education

- AS, Science, Mitchell College, New London, Connecticut

Engineer

gs.deverman@pnnl.gov

Phone: (509) 372-4429

Fax: (509) 372-6718



David Eakin

Since joining PNNL in 1977, Dave Eakin has held a variety of positions, including an assignment with Economic Development responsible for industrial liaison and as a key team member in an International Proliferation Prevention (IPP) project to develop and implement a new gamma irradiation source. He has managed a variety of projects and programs and has been involved in the full range of “hands-on” research, development, and commercialization activities. Mr. Eakin was Director of the Agri-Business Commercialization and Development, a unique cooperative effort between TRIDEC, Washington State University, Battelle/PNNL, US Department of Energy, and the Port of Benton. The center provided the atmosphere and infrastructure that encouraged the “seeding” (commercialization) of new businesses into the local and regional economy. Other positions Mr. Eakin has held at the Laboratory include Cost Account Manager/Task Leader for the Waste Treatment portion of PNNL's Hanford Waste Vitrification Plant Program; Project Leader for the Transportable Irradiator; and Manager of both the Washington and Alaska Irradiator portions of the Civilian Byproducts Utilization Program. Mr. Eakin has received two patents, an R&D 100 Award, and an FLC Technology Transfer Award (technology commercialization) for processes involving production of a high-valued chemical and novel separation processes. He is also a recognized expert in several areas and has received special invitations to give various short courses, speeches, and seminars. He has given over 50 presentations/speeches on a variety of topics and has authored/co-authored about 40 different articles, documents, and publications.

Education

- M.S., Engineering, University of California-Davis
- B.S., Chemical Engineering, Oregon State University
- Fermentation Technology Short Course
- Graduate Courses in Business Administration, University of Washington

Scientist

david.eakin@pnnl.gov

Phone : (509) 375-4504

Fax: (509) 376-3108



Laboratory Fellow

dougc.elliott@pnnl.gov

Phone: (509) 375-2248

Fax: (509) 372-4732

Doug Elliott

Mr. Elliott has over 35 years of research and project management experience in the Battelle system at the Pacific Northwest National Laboratory (PNNL). His work has mainly been directed toward development of fuels and chemicals from biomass and waste. His experience is primarily in high-pressure batch and continuous-flow processing reactor systems. This research has also involved him in extensive study of catalyst systems. In addition to process development, chemical and physical analysis has also been a significant part of his work. While at Battelle, Mr. Elliott's research has involved such subject areas as biomass liquefaction and hydroprocessing of product oils, catalytic hydrothermal gasification of wet biomass and wastewaters, and chemicals production from renewable sources. His work in biomass liquefaction has involved him in International Energy Agency Bioenergy tasks as the representative for the U.S. and currently as the leader of the Task 34 on Pyrolysis.

Research Interests

- Chemical process development
- Biomass conversion to fuels and chemicals by thermochemical processing
- Catalytic processing in condensed phases

Education

- M.B.A., Operations and Systems Analysis, University of Washington
- B.S., Chemistry (Departmental Honors), Montana State University



Technician

Matthew.Flake@pnnl.gov

Phone: (509) 375-2842

Fax: (509) 372-4732

Matt Flake

Matt came to PNNL in 2001 with 20+ years of experience in materials evaluation, transducer design and electronics, joining the Applied Physics/Material Characterization Group. Research interests were focused on, and still include, the development of ultrasonic transducers for novel sensing applications, as well as the use of high-power ultrasound for chemical processes, such as sonochemistry, photo-acoustics, as well as creating ordered structure in fluids and near-supercritical fluids. Now in the Chemical and Biological Process Development Group, he presently enjoys research challenges in improved catalysis for tar cracking and related thermo conversion processes.

Education

- Associate of Arts and Science, Columbia Basin College
- Level I ASNT Certification, Ultrasound



Senior Research Scientist

john.frye@pnnl.gov

Phone: (509) 375-2088

Fax: (509) 375-2323

John Frye

Mr. Frye joined Pacific Northwest National Laboratory (PNNL) in 1994 after working at the Standard Oil of Ohio Research Center for nearly 16 years, and prior to that for the Eveready Battery Division of Union Carbide Corp. for 3 ½ years. During his career at PNNL, he has been heavily involved in chemical process research and development, especially with respect to the development of robust catalysts for a variety of chemical applications. Mr. Frye has been named as an inventor on over 50 U.S. and foreign patents, and has been recognized as a Battelle Distinguished Inventor. Several of his efforts have resulted in commercial processes which have received several R&D 100 and FLC awards, and one Presidential Green Chemistry Award.

Research Interests

- Chemical and Biological Process Development
- Catalyst Synthesis
- Nano-structured Materials Synthesis
- Novel Chemical and Electrochemical Reactors

Education

- M.S., Chemistry, Case Western Reserve University (Ohio)
- Graduate Coursework in Chemistry, University of Texas at Austin
- B.S., Chemistry, Muskingum College (Ohio)

Scientist

mark.gerber@pnnl.gov

Phone: (509) 375-2399

Fax: (509) 372-4732

Mark Gerber

Mr. Gerber specializes in physical and chemical processes in the areas of hazardous and radioactive waste treatment, resource recovery, catalytic processing, and hydrocarbon fuels. Since joining the Laboratory in 1979, he has worked on wide variety of technology assessment and experimental research projects, ranging from biomass gasification to hazardous and radioactive waste technologies to catalytic processes. Some of his recent work involves laboratory research to support the development of precipitation processes to stabilize plutonium containing solutions, and remove chloride salts from plutonium containing solids located at Hanford's Plutonium Finishing Plant.

He also recently conducted research on the preparation and evaluation of catalysts used in a non-thermal plasma diesel engine exhaust treatment system. In the past, Mr. Gerber served as a technical advisor for DOE's In-Situ Remediation and Plumes Focus Area Programs, where he conducted state-of-the-art reviews of in-situ containment technologies, and contributed to similar technology reviews for in-situ and ex-situ chemical treatment technologies.

Education

- M.S., Chemical Engineering, University of Idaho
- B.S., Chemical Engineering, University of Idaho



Michel Gray

Michel Gray has over 5 years experience in Bio-fuels research, with respect to reactor design, fabrication, and operation. The research he has been involved in is related to the catalytic conversion of biomass to fuels and chemicals. He currently is co-inventor on three patents and has worked on projects that involve Synthesis Gas conversion to Alcohols, Gasification, and the conversion of Corn Ethanol byproducts to useful chemicals. His strengths are in reactor construction, reactor management, and analytical.

Research Interests

- Reactor Construction for Thermochemical Processes
- International Collaboration in Biomass Research
- Catalyst Development and Screening

Education

- B.S., Chemistry, Washington State University
- A.A.S., Columbia Basin College

Scientist

michel.gray@pnnl.gov

Phone: (509) 375-4549

Fax: call for fax



Richard Hallen

Rich Hallen has been at the lab for 30 years working as a research chemist in the area of chemical reactions and separation of components in complex mixtures. Areas of past research have included synthetic fuel production, gas separations, homogeneous and heterogeneous catalysis, industrial chemical synthesis, and waste treatment. More recent research has focused on the development and deployment of new chemical synthesis processes based upon alternate feedstocks. The research efforts are developing new materials from bio-based renewable resources and new processes for production of fuels and chemicals from renewable resources, primarily agricultural based feedstocks. One key area of research has involved catalytic transformation of fermentation derived compounds. Current efforts are focused on the conversion of biomass resources to high volume industrial chemicals and production of renewable jet and diesel fuels. Currently, serving as Team Lead for the Fuel Conversion Area of the NAABB consortium and is the PNNL project manager for the NABC consortium.

Research Interests

- Developing new materials from bio-based renewable resources.
- Developing new processes for production of fuels and chemicals from renewable resources (primarily agricultural based feedstocks).
- Catalytic transformation of fermentation-derived compounds.
- Conversion of biomass resources to high volume industrial chemicals and production of renewable jet and diesel fuels.

Education

- M.S., Chemistry, Oregon State University
- B.S., Mathematics and Physical Sciences, Lewis-Clark State College

Scientist

richard.hallen@pnnl.gov

Phone: (509) 375-6919

Fax: (509) 372-4732



Todd Hart

Todd Hart has more than 20 years experience in the research field. His work has mainly been directed toward developing a diverse technical expertise in analytical equipment and process controls. Mr. Hart has developed many unique methods for IC, GC, GC/MS/IR, ICP-OES, TGA/IR and TGA/MS analysis of samples ranging from bio-agriculture chemicals to Hanford tank wastes. His experience includes handling and processing, biomass, and wastes primarily in high-pressure batch and continuous-flow processing reactor systems and their design. This research has also involved an extensive study of catalysis systems. Mr. Hart has been named on two patents, and on the 1999 Presidential Green Chemistry Challenge Award, Economic Conservation of Cellulosic Biomass to Chemicals.

Scientist

todd.hart@pnnl.gov

Phone: (509) 371-6509

Fax: (509) 371-6242



Matthias Hess

Dr. Hess is an Assistant Professor at Washington State University Tri-Cities and holds a Joint Appointment as Staff Scientist with the Pacific Northwest National Laboratory (PNNL) since July 2011. He moved to the Tri-Cities after working for the Lawrence Berkeley National Laboratory and the DOE Joint Genome Institute in California and he has a particular interest in Systems Biology. Dr. Hess is employing high-throughput sequencing to i) identify novel biocatalysts that render industrial processes more efficient and ecological viable and to ii) obtain a better understanding of complex microbial communities (i.e. cow rumen, hot springs, natural oil, lake sediments) and how microbial systems effect the world we live in.

Besides his interest conducting cutting-edge research, Dr. Hess is devoted in training the next generation of scientists and he trains several undergraduate and graduate students in his laboratory, located in the Bioproducts, Sciences and Engineering Laboratory (BSEL) on the Washington State University-Tri-Cities Campus in Richland, Washington.

WSU/PNNL Joint-
Appointee

Assistant Professor/Staff
Scientist

Matthias.Hess@tricity.wsu.edu

Phone: 509-372-7377

Fax: 509-372-4732

Research Interests

- Systems Biology
- Metagenomics, Metatranscriptomics & Phylogenomics
- Biomass conversion to fuels and chemicals

Education

- Ph.D., Microbiology & Biotechnology, Hamburg University of Technology, Hamburg, Germany
- M.S., Microbiology, University of Konstanz, Konstanz, Germany,
- B.S., Microbiology, University of Konstanz, Konstanz, Germany, 1999



Beth Hofstad

Beth Hofstad has over 10 years of research experience. Subject areas include bioremediation, pharmaceuticals, enzyme, organic acid and ethanol production. She currently works in Chemical and Biological Process Development group. Within this group, she is focused on creating biofuels and bioproducts using fungal strains. She is currently working with fellow scientists identifying and quantifying cellulose degrading enzymes using activity based chemical probes. She is assisting in research using proteomics to identify proteins involved in the production of lipids in algae.

She has been part of many publications, including journal articles, conference proceedings and technical reports. Mrs. Hofstad originally joined PNNL in 1990 and rejoined PNNL in 1997 after college.

Scientist

beth.hofstad@pnnl.gov

Phone: (509) 375-4342

Fax: (509) 375-6422

Research Interests

- Fundamental research using filamentous fungi to convert biomass to high-value chemical products like fuels, chemicals and enzymes.
- Biochemical process engineering and genetic engineering to better understand and control fungal metabolism.

Education

- B.S., Microbiology, Washington State University



Timothy Hubler

Dr. Hubler was appointed to Pacific Northwest National Laboratory (PNNL) in June 1992 as a postdoctoral fellow and joined the staff of PNNL in October 1994. He is a member of the Chemical and Biological Process Development Group, Energy and Environment Directorate. His work at PNNL has included development of selective polymer films for spectroelectrochemical sensing of pertechnetate ion (TcO_4^-), new approaches to actinide separation processes for spent nuclear fuel and environmental remediation including support of research efforts for the Waste Treatment Plant at Hanford, and he is an instructor for international border security training for detection/interdiction of illicit chemical and radiological material threats. The participants in these classes have included U.S. Customs and Border Protection Officers and Agents as well as customs and border police officials from over 60 countries. He is a certified DOE Instructor through the National Training Center.

Senior Research Scientist

tim.hubler@pnnl.gov

Phone: (509) 371-6274

Fax: (509) 372-4732

Research Interests

- Chemical and Biological Process Development
- Detection of Illicit Radiological and Chemical Materials



Michele Jensen

Currently with the Energy Processes and Materials Division, previously worked for Business Support Services (BSS) for 8 years (Business Office and Contracts Office). Worked in Environmental Technology Division (ETD) 5 years performing secretarial functions.

- Provide project management and administrative support to staff in a diversified group of Product Lines such as Energy, Environmental, and National Security.
- Expert knowledge of management systems, PNNL procedures, and client requirements and I am proactive in decision-making and problem solving.
- Software knowledge includes Microsoft Excel, Word, PowerPoint, and all PNNL financial accounting and contracting systems.

Specialist

michele.jensen@pnnl.gov

Phone: (509) 375-3977

Fax: (509) 372-4458

Research Interests

- Biomass Power Generation, DOE-EE



Sue Karagiosis

Dr. Karagiosis is focused on understanding the mechanism of citric acid overproduction by the fungus *Aspergillus niger* using a molecular and cell biology approach. Sue has extensive experience with molecular genetics, cellular and developmental biology using *Drosophila melanogaster*, mammalian cell culture and filamentous fungi model systems. She completed her Ph.D. at Purdue University in 2003. Sue investigated the cellular and molecular mechanisms of morphogenesis of the photoreceptor cell. She joined the Pacific Northwest National Laboratory in January 2006 as a postdoctoral fellow and examined the signaling transduction involved in lysophosphatidic acid-induced osteoblast migration. In May of 2008, Sue joined the staff in the Chemical and Biological Process Development Group.

Research Interests

- Fungal biotechnology
- Utilizing filamentous fungi to convert biomass to high-value chemical products

Scientist

sue.karagiosis@pnnl.gov

Phone: (509) 375-3797

Fax: (509) 372-4732

Education

- Ph.D. Biology, Purdue University
- B.S. Microbiology, cum laude, University of South Florida



Onie King

Research Interests

- Webpage Design
- Graphic Art Design

Education

- A.A., Columbia Basin College - Currently in the process of obtaining
- High School Diploma

Administrator

onie.king@pnl.gov

Phone: (509) 375-3914

Fax: (509) 372-4458



Debbie Lee

Debbie Lee has been doing research for seven years. In her current work, the use of filamentous fungi is used for converting biomass for ethanol production. Others areas of interest include morphology studies and the production of bioproducts. The work goes from small scale shake flask experiments all the way to 30L fermentations.

Education

- Columbia Basin College Associates Arts and Science
- Columbia Basin College Associates Business Administration

Technician

debra.lee@pnl.gov

Phone: (509) 372-4349

Fax: (509) 372-4732



Scientist
Guo-Shuh.Lee@pnnl.gov
Phone: (509) 371-6125
Fax: call for fax

John Lee

John Lee has been with PNNL since 2009. His work is focused on the catalyst development for the Catalytic Fast Pyrolysis of biomass and upgrades of bio oil. His recent interests are to upgrade various oxygenates to hydrocarbon fuels. Prior PNNL he has worked for the Dow Chemicals for over 30 years on Catalysis and Process Chemistry. He has authored or co-authored more than 30 publications, including over 20 patents and a chapter on Industrial Organic Chemicals for “Kent and Riegel’s Handbook of Industrial Chemistry and Biotechnology”.

Research Interests

- Catalysis and Process Chemistry (Including zeolite catalysis, solid acid and solid base catalysis, catalysis in bio-products, selective oxidation, selective hydrogenation reactions, shape selective reactions).

Education

- Ph.D. Inorganic Chemistry, Michigan State University
- M.S. Chemistry, Eastern Michigan University
- B.S. Chemistry, Tamkang University



Scientist
suh-jane.lee@pnnl.gov
Phone: (509) 375-4322
Fax: (509) 372-4732

Suh-Jane Lee

Dr. Lee joined Pacific Northwest National Laboratory’s Energy and Environmental Directorate in 2008 after her post doctoral training in PNNL’s Fundamental Sciences Directorate. She is currently working on development of catalysts for stabilizing and upgrading bio-oil. Dr. Lee is focusing on syntheses and characterization of homogenous/heterogeneous catalysts. She also prepares noble materials for fuel cell and biosensors.

Education

- Ph.D. Inorganic Chemistry, University of Idaho
- M.S. Environmental Science, University of Idaho
- B.A. Interdisciplinary, University of Missouri-Columbia



Scientist

Teresa.Lemmon@pnnl.gov

Phone: (509) 371-7366

Fax: call for fax

Teresa Lemmon

Teresa Lemmon has over 15 years experience as an analytical chemist. Her experience includes a wide variety of analytical techniques including elemental analysis by ICP, AAS, XRF and separation techniques including GC, LC, and IC. This analysis is critical to researchers monitoring substrates, intermediates or products in a system, determining catalyst activity and loading, and evaluating trace contaminants in raw materials and/or products.

Research Interests

- Providing analytical analysis including method development, separation, identification and quantification.

Education

- Ph.D. Analytical Chemistry, Oregon State University
- B.A. Math/Chemistry, University of Northern Colorado



Scientist

mike.lilga@pnnl.gov

Phone: (509) 375-4354

Fax: (509) 372-4732

Michael Lilga

Mike Lilga is an inorganic and organometallic chemist with experience in a variety of areas including synthesis and characterization of inorganic complexes, electrochemistry, applications of complexes to catalysis and gas separations, sequestration of metal ions, selective hydrocarbon oxidation, and catalysis of coal gasification and the water-gas shift reaction. He has extensive experience with infrared, ultraviolet, visible, and multinuclear NMR spectroscopies and electrochemistry. Dr. Lilga was one of the developers of the Electrically Switched Ion Exchange process, which removes metal ions from aqueous streams using modulation of the potential of electroactive films on electrode surfaces. He was also a principal contributor to the Hanford Waste Tank Safety Program, where he studied the destruction of nickel ferrocyanides by dissolution and hydrolysis and destruction of organic components of waste. Results of the studies helped resolve the Tank Safety Issues.

Education

- Ph.D., Inorganic Chemistry, Northwestern University
- B.S., Chemistry (Summa Cum Laude), State University of New York/Fredonia



Administrator

Ana.Lundeby@pnnl.gov

Phone: (509) 372-4891

Fax: call for fax

Ana Lundeby

Ana Lundeby is the Group Administrator for the Chemical and Biological Process Development Group. She has been with Pacific Northwest National Laboratory (PNNL) since 1992. Ana assists the CBPD group of over 50 staff members with travel schedules, group meetings, brown bags, purchase orders, foreign national visits, scheduling interviews, and daily office management. The group is located at University-Tri-Cities Campus (WSU), Richland, WA. Ana also interacts and supports the WSU-TC staff/activities due to the unique location.



Scientist

Jon.Magnuson@pnnl.gov

Phone: (509) 372-4119

Fax: (509) 372-4732

Jon Magnuson

Jon Magnuson is a biochemist with more than 20 years of research experience studying enzymes and metabolic pathways in bacteria and fungi. Dr. Magnuson is currently part of a team utilizing filamentous fungi in the development of processes for converting renewable biomass to fuels, chemicals and enzymes. This research involves the discovery and manipulation of genes encoding the enzymes of biosynthetic pathways or the regulation of those pathways. Complementary to this work is his major interest in fungal genomics. He is involved in the annotation and analysis of many fungal genomes with particular focus on the enzymes involved in the breakdown of plant biomass into sugars. Another area of his research is developing tools to assess and understand the diversity of fungi and other eukaryotic microbes found in different natural environments. This research has culminated in the development of a microarray based on a highly variable region of the ribosomal RNA gene, which is useful for the study of the diverse fungi, diatoms and green algae found in soils, sediments and natural biofilms.

Education

- Ph.D., Biochemistry, University of Minnesota
- B.S., Biochemistry, University of Minnesota

Engineer

[gary.neuenschwander@](mailto:gary.neuenschwander@pnnl.gov)

pnnl.gov

Phone: (509) 375-2760

Fax: (509) 372-4460

Gary Neuenschwander

Since joining the laboratory in 1984, Gary Neuenschwander has contributed to studies on the gasification, liquefaction, and hydrotreating of biomass feedstocks and the destruction of agricultural and organic chemical wastes. He has also helped develop new technologies such as the Pyroflux, PCB Demo pilot plant, RubberCycle, RTDS, NITREM, MICRO-CATS, and the production of a number of chemicals under the Bioproducts Initiative. Most of his work has involved the design, fabrication, and operation of high-temperature, high-pressure continuous feed and batch systems and pilot plants, data acquisition, as well as analytical work such as gas chromatography, solvent extractions, micro-distillations, bomb calorimetry, and elemental analyses. He has also worked on several microbial mechanisms where the process needed to be optimized and scaled up. Mr. Neuenschwander has written many Safe Operating Procedures, Acceptance Test Procedures, Project Test Plans, and was a member of two SBMS subject areas (Pressure Systems and Lock and Tag) development teams. He was also a member of the Lock and Tag committee and has worked extensively with building managers, Facilities Management, ES&H, Operations staff, and many others in support of his responsibilities. Mr. Neuenschwander has received four R&D 100 awards and an FLC award, and has been a co-author on numerous publications.

Education

- B.S., Iowa State University



Mariefel Olarte

Dr. Mariefel Olarte joined PNNL in 2011 after completing her graduate studies under the supervision of Christopher W. Jones and Pradeep K. Agrawal from the Georgia Institute of Technology. She has experience in catalyst synthesis and characterization as well as in the analysis of thermochemically-processed biomass products. More specifically, Dr. Olarte has experience related to the catalytic conversion of biomass to renewable fuels and chemicals involved working on aqueous phase reforming of pine, biomass fractionation (aqueous- and ionic liquid-phase acid hydrolysis and lignin depolymerization) and catalytic upgrading of phenolic compounds.

Research Interests

- Catalytic upgrading of biomass for renewable fuel and chemical production
- Catalyst synthesis and characterization
- Analysis of biomass-derived liquid products

Education

- Ph.D. Chemical Engineering, Georgia Institute of Technology
- M.S. Paper Science and Engineering, Georgia Institute of Technology
- B.S. Chemical Engineering, University of the Philippines Los Baños

Engineer

Mariefel.Olarte@pnnl.gov

Phone: (509) 375-2200

Fax: call for fax



Rick Orth

Dr. Orth joined the Pacific Northwest National Laboratory (PNNL) in 1992 after working for four years for Unocal Corporation. During his career at PNNL, he has been involved in process development activities at the technical, project management and group management levels. More specifically, Dr. Orth has been involved with the development of processes for conversion of biobased materials to value-added chemicals and fuels. Examples include processes for the recovery of value-added chemicals from wheat mill feed and corn fiber. Dr. Orth is currently the Technical Group Manager of the Chemical and Biological Process Development Group. This group is comprised of over 50 staff who are involved in research and process development activities related to biochemical, thermochemical and catalytic conversion of biobased materials to value-added chemicals and fuels. The group resides in the Bioproducts, Sciences and Engineering Laboratory (BSEL) that is located on the Washington State University-Tri-Cities Campus in Richland, Washington.

Manager

rick.orth@pnnl.gov

Phone: (509) 375-6709

Fax: (509) 372-4732

Research Interests

- Chemical and biological process development
- Biomass conversion to fuels and chemicals

Education

- Ph.D., Chemical Engineering, Washington State University
- M.S., Chemical Engineering, Washington State University
- B.S., Biology, University of Washington



Ellen Panisko

Dr. Panisko currently uses proteomic and molecular biology methods to study fungal morphology and hyperproductivity. She is experienced with stable isotope labeling strategies and affinity purification of peptides for mass spectral analysis. One of her current projects focuses on the contribution of technical and biological variability to relative protein concentration determined by high throughput proteome analyses. Her graduate and postdoctoral research experience has included expression of heterologous proteins in plant tissues and investigating the kinetics of a tricarboxylic acid cycle enzyme in *Saccharaomyces cerevisiae*. In 2002, she became a member of the Fungal Biotechnology team.

Education

- Ph.D., Biochemistry, University of Texas Health Science Center at San Antonio
- B.S., Biochemistry, cum laude, Washington State University

Scientist

ellen.panisko@pnnl.gov

Phone: (509) 372-4282

Fax: (509) 372-4732



Keith Peterson

Keith Peterson has 14 years experience in chemical research, focusing on environmental projects. He currently conducts applied catalytic reaction research, evaluating high-value chemical manufacture from renewable, bio-based feedstocks. Mr. Peterson has made major contributions to projects in the area of pollution prevention and sustainable design, including industrial ecology, green buildings, and sustainable systems design; industrial pollution prevention technologies; integrated natural resource management; sustainable technologies and management systems; environmental policy & risk management; and strategic business planning incorporating environmental design principles.

Education

- B.S., Environmental Chemistry, Western Washington University
- Certified Sustainable Building Design Advisor, Seattle Central Community College

Engineer

keith.peterson@pnnl.gov

Phone: (509) 372-4540

Fax: (509) 372-4732



Max Phelps

Since joining PNNL in 1991, Max Phelps has participated in diverse projects involving chemical process development, process control, and equipment design. His areas of expertise include process control and equipment design for waste minimization, pollution prevention and treatment, as well as laboratory-scale and pilot-scale development and offsite deployment of chemical and physical process systems. Much of his work has focused on exploring the use of supercritical fluids, and surfactants in supercritical and near-critical fluids, as alternatives to more hazardous solvents. Mr. Phelps has worked closely with all branches of the military as a technical contact for testing innovative pollution prevention technologies. The nature of these projects has required frequent communications and interactions with Industry and Military, as well as other laboratories, including Los Alamos National Laboratory, Sandia National Laboratory, Idaho National Engineering Laboratory, and Argonne National Laboratory. His work includes onsite engineering and development to offsite deployment of several systems, such as Base Catalyzed Destruction of PCBs in soils; thermochemical conversion of wastes to fuel gas and gray water; membrane-based separations for recovery and reuse of highly caustic solvents; supercritical fluid cleaning; and solvent substitution in the areas of parts cleaning and coating application.

Education

- B.S., Chemical Engineering, Washington State University

Project Manager

Max.Phelps@pnnl.gov

Phone: (509) 375-6678

Fax: (509) 372-6985



Engineer

karthi@pnnl.gov

Phone: (509) 372-6976

Fax: (509) 372-4732

Karthi Ramasamy

Mr. Karthi, Process Engineer, holds BS degree in Chemical Engineering and MS in Environmental Engineering. Prior to joining Battelle/PNNL Mr. Karthi was a Research Engineer at Florida Solar Energy Center, Cocoa, FL from 2002 to 2008. He was involved in process development, laboratory and demonstration scale unit fabrication and optimization. He has been at Battelle/PNNL since January 2009. During his time at PNNL, Mr. Karthi has been involved in the research and process development of producing specialty chemical from the biomass material through thermo chemical process. His current focus is on converting oxygenates to fuels.

Research Interests

- Renewable fuels
- Renewable chemicals
- Supercritical water reformation
- Catalysis

Education

- Ph.D. Chemical Engineering, Washington State University, Present
- M.S. Environmental Engineering, University of Central Florida
- B.S. Chemical Engineering, Bharathiar University, India

Engineer

Bob.Romine@pnnl.gov

Phone: (509) 375-6728

Fax: (509) 372-4732

Robert Romine

Bob Romine's professional experience includes research in the fields of process chemistry, materials science, bioprocessing, asphalt chemistry, waste recycling technology and technology assessment and commercialization. Since joining PNNL in 1991, he has focused on several research areas, including sustainable processing, pollution prevention; non-proliferation programs in the former Soviet Union (FSU), where he was technical lead for the Chemical Weapons Sector; and technical support for Hanford cleanup missions such as the Hanford Permanent Isolation Barrier, Ferrocyanide Tank Safety Program and Hanford Grout Technology Program. He is currently developing fermentation protocols using filamentous fungi and bacteria for the conversion of sustainable feedstocks to produce commodity and specialty chemicals. Mr. Romine was the Principal Investigator for the RubberCycle Process, in which extremophilic microorganisms were evaluated to be used to chemically modify the surface of finely ground waste tire rubber particles.

Education

- B.S., Chemistry, University of Texas



Technician

Leslie.Rotness@pnnl.gov

Phone: (509) 372-6875

Fax: (509) 372-4732

LJ Rotness

L.J. Rotness joined the lab in 2008. As a researcher in the field of biomass, he draws on his experience in thermo chemical conversion, and GC analysis. His work is geared toward the operation, maintenance, and design of high pressure, high temperature continuous-flow systems. As an undergrad in the field of mechanical engineering, his educational pursuit combines scholastics with lab experience, handling and processing biomass and waste.



Technician

becky.rummel@pnnl.gov

Phone: (509) 375-2497

Fax: (509) 372-4732

Becky Rummel

Becky Rummel works as a technician for the Mixed Alcohol Fuel Synthesis project. She operates four reactors, collects data, and issues reports to her supervisors. She serves as a backup technician for other projects and has various responsibilities throughout BSEL, including chemical inventory duties, sample preparation and analytical data processing, and works diligently to maintain safety and integrity in the lab.

Education

- A.A.S. Columbia Basin College



Engineer

Daniel.Santosa@pnnl.gov

Phone: (509) 372-4821

Fax: (509) 372-4732

Miki Santosa

Miki Santosa joined the Pacific Northwest National Laboratory (PNNL) in 2008 after interning with Prometheus Energy Company. During the past three years with PNNL, he has been involved in various projects, both in analysis and technical side of the group. Most recently, Miki has been highly involved with the development of processes for conversion of biomass to higher value product on projects led by Alan Zacher and Douglas Elliott.

Research Interests

- Process development- fast pyrolysis and catalytic upgrading of pyrolysis products to fuels and chemicals.
- Biomass feedstock characterization with empirical validation utilizing PNNL's pyrolysis conversion process.
- Techno-Economic-Analysis (TEA) for fuels and chemicals production from biomass.

Education

- B.S Chemical Engineering with specialization in biotechnology, University of Washington



Engineer

andy.schmidt@pnnl.gov

Phone: (509) 375-2280

Fax: (509) 372-4732

Andrew Schmidt

Andy Schmidt's research interests include separations processing, hydrothermal processing and biomass conversion. At PNNL, his work in these areas has ranged from individual contributor and design engineer to flowsheet development, project feasibility and development and project management for industrial clients as well as Hanford Site contractors. Mr. Schmidt has made several contributions to the development of the K Basin Sludge Pretreatment System and to optimization testing and process start-up in support of the solution stabilization processing (magnesium hydroxide and oxalate precipitation) at the Plutonium Finishing Plant (PFP).

Education

- M.S., Chemical Engineering, Washington State University
- B.S., Chemical Engineering, Washington State University



Engineer
lesley.snowden-swan@pnnl.gov
Phone: (509) 933-2145
Fax: call for fax

Lesley Snowden-Swan

Lesley Snowden-Swan joined PNNL in 1991. During her career she has contributed to the development of pollution prevention and waste minimization capabilities at the Laboratory. She has conducted, managed, and marketed projects regarding pollution prevention, waste minimization, environmental compliance and sustainability issues applied to process technology development and assessment. She is currently involved in projects supporting the DOE's Office of Biomass Programs, including techno-economic analysis and sustainability metrics development for biofuels. Ms. Snowden-Swan has authored or co-authored 18 publications, holds one patent, and one R&D 100 Award.

Research Interests

- Sustainable Fuel Process Design
- Life Cycle Analysis of Fuels and Energy
- Sustainability Metrics for Renewable Fuels
- Techno-economic Analysis

Education

- M.S. Chemical Engineering, The Johns Hopkins University B.S. Chemical Engineering, University of Washington



Engineer
Marie.Swita@pnnl.gov
Phone: (509) 372-6965
Fax: call for fax

Marie Swita

Joined the Chemical and Biological Process Development Group in March 2011. Previously worked for Battelle Toxicology Northwest for six years as an analytical chemistry researcher. Experience with LC and GC analysis. Currently working in the Combinatorial High Throughput Laboratory.

Research Interests

- Discovering solutions to energy and environmental issues
- Catalysis and reaction engineering

Education

- M.S. Secondary Education - Washington State University
- B.S. Biology Summa Cum Laude - Washington State University



Scientist

iva.tews@pnnl.gov

Phone: (509) 375-6804

Fax: (509) 372-4732

Iva Tews

Iva Jovanovic Tews joined Pacific Northwest National Laboratory (PNNL) in 2008 shortly after graduation from University of Washington with a bachelor's degree in Bioengineering. Iva joined the Chemical and Biological Process Development group and has been involved in project work for both Biochemical and Thermochemical Processes. Specifically her work has focused on fungal fermentation development and technoeconomic assessment (TEA) of alternative fuel processes. Ms. Tews has recently focused on developing and applying laboratory data to technoeconomic models for cellulosic ethanol production.

International collaborative work has also been an area of carrier focus for Ms. Tews. She has been involved in managing a multi laboratory international effort in Fast Pyrolysis TEA analysis.

Research Interests

- Bioconversion process design
- Thermo-conversion process development
- Technoeconomic Analysis

Education

- B.S., Bioengineering, University of Washington



Engineer

corinne.valkenburg@pnnl.gov

pnnl.gov

Phone: (509) 392-9989

Fax: call for fax

Corinne Valkenburg

Ms. Valkenburg's primary research focus is availability and thermochemical conversion of biomass and municipal solid wastes. Her expertise is in applied research including design, build, and operation of test stands as well as process modeling for technoeconomic analysis of conversion pathways and carbon capture. Ms. Valkenburg started a long-term detail assignment to the US Department of Energy, Energy Efficiency and Renewable Energy's Office of Biomass in October 2010.

Research Interests

- Chemical and biological process development
- Biomass conversion to fuels and chemicals
- Energy systems analysis

Education

- M.S., University of California/ Riverside Bourns College of Engineering, Chemical and Environmental Engineering
- B.S., University of California/ Riverside Bourns College of Engineering, Chemical Engineering



Theresa VanCorbach

Theresa VanCorbach is the Administrator for John Holladay, Manager of the Pacific Northwest National Laboratory (PNNL) Biomass Program and assists with administrative duties for the Chemical and Biological Process Development Group. She has been with PNNL since 2000. Her previous office experience includes advertising, product sales, accounts payable, inventory control and product quality assurance. Ms. VanCorbach is very knowledgeable of PNNL policies and procedures.

Proficient in Microsoft Office Suite, Internet Explorer, and PNNL-based programs. Maintains effective working relationships with counterparts across PNNL, as well as with contacts in PNSO, DOE-OE, other national laboratories and universities. Knowledge of immigration policy and procedures pertaining to foreign national staff members in a DOE environment. Excellent interpersonal skills, prioritization, and ability to demonstrate sound judgment on sensitive issues.

Administrator

theresa.vancorbach@pnnl.gov

Phone: (509) 375-2359

Fax: (509) 375-2379



Huamin Wang

Huamin Wang joined PNNL in 2011 after completing his postdoctoral researches at Lawrence Berkeley National Laboratory (LBNL) and U.C. Berkeley with Prof. E. Iglesia in 2011 and at ETH Zurich, Switzerland with Prof. R. Prins in 2008. He received his Ph.D. in Physical Chemistry and his B.S. in Chemistry in 2006 and 2001, respectively, from Nankai University, China. He has experience in studies of reaction mechanisms and kinetics of catalytic hydrotreating (HDS and HDN) reactions on metal and sulfide surfaces, hydrogen management during hydrotreating catalysis, as well as catalyst development and characterization. His research in PNNL involves catalytic pyrolysis of biomass and catalytic hydrotreating and upgrading of bio-oil during transformation of biomass to fuels and chemicals.

Engineer

Huamin.Wang@pnnl.gov

Phone: (509) 371-6705

Fax: call for fax

Research Interests

- Conversion of biomass and renewable feedstocks to fuels and chemicals.
- Catalytic hydrotreating of biomass and fossil derived fuel products.
- Reaction mechanism and chemical kinetic of heterogeneous catalytic reactions.
- Design, synthesis, and characterization of inorganic solids useful as catalysts.

Education

- Ph.D. Physical Chemistry, Nankai University, China
- B.S. Chemistry, Nankai University, China



Research Engineer
alan.zacher@pnnl.gov
Phone: (509) 372-4545
Fax: (509) 372-4732

Alan Zacher

Alan joined Pacific Northwest National Laboratory (PNNL) in 1993. During his career at PNNL, he has been involved in a wide variety of research areas including catalytic and non-catalytic hydrothermal processing, thermochemical biomass conversion, technology development for waste treatment, domestic and international security efforts, Hanford site related research, as well as practical and platform teaching experience. Notably among them is being on the team that developed PGRS, the commercialized industrial process for producing propylene glycol from renewable resources. Over the years, he has been involved in pilot plant design, construction, commissioning, troubleshooting, and modification of fixed facility and mobile systems both on and off site. Alan is currently working in the field thermochemical conversion of biomass to fuels. His current efforts are mainly associated with biomass pyrolysis and/or catalytic upgrading of bio-oil into fungible fuel blend stocks.

Research Interests

- Biomass conversion to fuels and chemicals
- Pilot and demonstration plant development

Education

- B.S., Chemical Engineering, Washington State University
- B.S., Chemistry, Washington State University



Technician
andy.zwoster@pnnl.gov
Phone: (509) 375-2012
Fax: (509) 371-7150

Andy Zwoster

Andy Zwoster is an experienced technician in microbiological, chemical process and mechanical fields. His experience includes operation, maintenance and modifications to experimental reactor systems. Research areas include the study of filamentous fungi for conversion of biomass feedstocks to fuels or chemical products and CO₂ capture from exhaust gas emission sources.

Education

- AAAS Biotechnology SCC