

WSU Bioproducts Research Summary
*Washington State University-- Department of Biological Systems Engineering –Agri-
Environmental and Bioproducts Engineering Research Group (AEBE)*

The AEBE research group is a multi-disciplinary research group which has as its mission the conducting of applied and fundamental research to provide technical tools and advanced knowledge for addressing agriculture related environmental challenges and for biomass processing and bioproduct development. More details about the research group and their research activities can be found at <http://www.bsyse.wsu.edu/aebe>.

Research Team

The research team consists of: research leader Dr. Shulin Chen; researchers, Chaunbin Liu, Zhiyou Wen, Bingcheng Zhao, and Goksel Demirer; graduate students Wei Lao, Yan Liu, Simon Smith, Guobin Fu, Gabriel Mancilla, Cairo Okoren, Qiang Pan, Bill Johnson, Jian Ling, and Craig Frear; as well as technicians Jonothan Lomber, Bill Bowe, and Cary Swanson.

Existing Research

Chitosan and Lactic Acid Production from Cull Potatoes
Omega 3 Fatty Acids from Agricultural and Industrial Waste
Value-Added Chemicals from Animal Manure
C-5 Sugar Utilization in Lignocellulosic Material
Anaerobic Digestion Optimization
Nisin and Lactic Acid from Cheese Whey
Aquaculture Recirculation Engineering
Aquaculture Raceway Engineering
Biomass Inventory and Assessment for Washington State
Watershed TMDL's
Water Quantity, Water Quality and Soil Erosion at a Watershed Scale for the IPNW

Bioproduct Positioning

Bioproduct research has recently emerged as a major new initiative in the US with a forecasted increase in federal and state funding. The BSYSE team believes that although WSU is uniquely positioned with currently successful research programs and a newly established Northwest Bioproducts Research Institute, an organized interdisciplinary program is currently lacking. To that end, the team has been working tirelessly to develop new initiatives and collaborations that will ensure the growth of such a program and propel WSU into the forefront of bioproducts research and education. Below are some of the programs and initiatives that the research team has been supporting and/or initiating.

WSU/UI Bioprocess Engineering and Bioproducts Development Center (BPBD Center)

The WSU/UI BPBD Center is proposed to advance a multidisciplinary approach to understanding and solving environmental problems through biotechnology, and for equipping the next generation of environmental scientists and engineers with biotechnological tools for scientific exploration. The Center will facilitate the integration of education, research and technological application within the two universities, the two nearby national laboratories and

local businesses. It will build on WSU and UI's national and international strength in environmental research and will advance WSU's strategic goals in biotechnology. The proposed center will work synergistically with the existing Centers of Integrated Biotechnology (CIB) and Sustaining Agriculture and Natural Resources (CSANR) and will compliment WSU's biotechnology strength in health, agriculture and the environment. The proposed center will focus on three complimentary research thrust areas that overlap significantly such that maximum interdisciplinary synergy will be achieved. The proposed thrust areas include Bioproducts Technology, Extramophile Capabilities, and Microbial Biochemistry.

Bioproducts Graduate Training Program (IGERT)

The goal of this effort is to catapult Washington State University to new research prominence in the emerging area of biomass processing and bioproducts development (BPBD) through the establishment of a collaborative, interdisciplinary graduate education and research program. The BPBD focus will be on converting agricultural feedstock (including agricultural waste, residues, and products) into biofuels, basic biochemicals and high value bioproducts. Catalyzed by increasing interests in bioproducts and bioenergy, this highly interdisciplinary graduate training program will allow participants from WSU's already strong programs in plant science, molecular microbiology, biochemical process engineering, and biomass utilization, to form synergistic teams that can better explore this new frontier. In addition, graduate students will be holistically exposed and trained, not only enabling them to be future visionary leaders within this important field, but positioning the University as a premier institution in bioproduct education.

Bioproducts Seminar Series (IGERT/BPBD Center Seminar Series)

The purpose of this proposal is to initiate collaboration among interested faculties for establishing a new Bioproduct Program at WSU. The goal of the proposal is to create opportunities for discussion and information exchange within WSU by establishing new ties among WSU faculties and between WSU and other institutions and government agencies. The proposed activities include holding a retreat for interested WSU faculty and a seminar series featuring outside speakers who are leaders in the related fields.