

Eric J. Allain
Assistant Professor
Appalachian State University
Department of Chemistry
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EDUCATION

University of Illinois, Urbana, IL

Ph.D. in Biochemistry

1996

Dissertation: "Enantioselective Epoxidation of Alkenes by Chloroperoxidase and the Development of a Chloroperoxidase Expression System"

Illinois Benedictine College, Lisle, IL

B.S. in Biochemistry

1989

AWARDS

Frigerio Award – Outstanding Freshman Biochemist **1986**

Sophomore Excellence in Organic Chemistry Award **1987**

Snoke Award – Top Junior Biochemist **1988**

Chicago Drug and Chemical Society College Award **1989**

American Institute of Chemists Award **1989**

Outstanding Speaker – Biochemistry Graduate Student Conference **1993**

Best R&D Project Award – Novozymes North America **2004**

Spark and Passion Award – Novozymes North America **2005**

Best R&D Project Award – Novozymes North America **2005**

PROFESSIONAL EXPERIENCE

Appalachian State University, Boone, NC

Assistant Professor – Department of Chemistry

2005 - Present

- Primarily responsible for biochemistry courses.
- Research areas include: applied biochemistry, fuel alcohol biochemistry, and mathematical modeling of metabolic networks.

Novozymes North America, Inc., Franklinton, NC

Senior Scientist – Fuel Alcohol Research

2000-2005

- Developed a mini scale high throughput assay for studying and evaluating enzymes in fuel alcohol fermentations.
- Researched methods for mathematical modeling of fuel alcohol fermentations.
- Championed the use of NIR spectroscopy and chemometrics as a tool to study and screen for enzyme performance in fuel alcohol production.

Nalco Chemical Company, Naperville, IL

Senior Research Chemist – Global Microbiology Research

1999 - 2000

- Studied the potential use of the enzyme laccase as a microorganism control agent.
- Performed research to examine the effects of conventional biocides on bacterial signaling molecules.
- Participated in a team effort to develop and field trial a fluorescent based microorganism detection system.

Senior Chemist – Global Microbiology Research

1997-1999

- Primary project involved using enzymes as an environmentally friendly approach to remove microbial biofilms.
- Conducted exploratory research on the application of enzymes in polymer and monomer synthesis.

- Developed and patented a novel process for manufacturing one of Nalco's oxidizing biocide products.

University of Illinois, Urbana, IL

Graduate Research Biochemist

1989-1996

- Discovered, characterized and patented an enzymatic process for asymmetric synthesis of epoxides.
- Worked to develop an expression system for chloroperoxidase.
- Teaching assistant for biochemistry lecture and laboratory courses.

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Allain, E. J.; Madison, A.; Dardugno, D; Salinas, R. A.; Marland, E. (2006) Enzyme optimization for cell free ethanol production. Lecture presented at the 28th Symposium on Biotechnology for Fuels and Chemicals, Nashville, TN.

Fukuyama, Shiro; Matsui, Tomoko; Soong, Chee-Leong; Allain, Eric; Vikso-Nielsen, Anders; Udagawa, Hiroaki; Liu, Ye; Duan, Junxin; Wu, Wenping; Andersen, Lene Nonboe; Landvik, Sara (2006) Chimeric α -amylases comprising catalytic and carbohydrate-binding modules and the use for starch processing. PCT Int. Patent Appl.

Udagawa, Hiroaki; Landvik, Sara; Ihara, Michiko; Liu, Jiyin; Soong, Chee-Leong; Allain, Eric; Fukuyama, Shiro (2006) Fungal polynucleotide and polypeptide sequences with glucoamylase activity and uses thereof. PCT Int. Patent Appl.

Allain, Eric; Wenger, Kevin S.; Bisgard-Frantzen, Henrik; Henderson, Lori; Costable, Carmen (2005) Fermentation processes. PCT Int. Patent Appl.

Allain, Eric; Wenger, Kevin S.; Bisgard-Frantzen, Henrik (2005) Processes for producing a fermentation product, such as ethanol, from milled starch without gelatinization using glucoamylase from *Athelia rolfsii* and acid α -amylase. PCT Int. Patent Appl.

Borchert, Torben; Danielsen, Steffen; Allain, Eric (2005) Methods for engineering fusion proteins of glucoamylase or α -amylase starch binding and catalytic domains of *Aspergillus niger*, *Talaromyces emersonii* and *Athelia rolfsii* for production of ethanol in *Saccharomyces cerevisiae*. PCT Int. Patent Appl.

Taira, Rikako; Tkgai, Shinobu; Hjort, Carsten; Vikso-Nielsen, Anders; Allain, Eric; Udagawa, Hiroaki (2005) Fungal α -amylase fusion proteins for starch processing. PCT Int. Patent Appl.

Allain, E. J. (2004) Lab scale modeling of fuel alcohol fermentations. Lecture presented at the 2004 International Fuel Ethanol Workshop, Madison, WI.

Allain, E. J.; Costable, C.; Wenger, K. S. (2004) Lab scale modeling of fuel alcohol fermentations. Poster presented at the 26th Symposium on Biotechnology for Fuels and Chemicals, Chattanooga, TN.

Allain E. J.; Crabb, G. (2003) Future innovations in fuel alcohol ... the road to the ethanol plant of the future. Lecture presented at the 2003 International Fuel Ethanol Workshop, Sioux Falls, SD.

Allain, E. J. (2002) Evaluation of enzymes for fuel alcohol production. Lecture presented at the 53rd Starch Conference, Detmold, Germany.

Chattoraj, M.; Fehr, M. J.; Hatch, S. R.; Allain, E. J. (2002) Online measurement and control of microbiological activity in industrial water systems. *Materials Performance* 41(4), 40-45.

Borchardt, S. A.; Allain, E. J.; Michels, J. J.; Stearns, G. W.; Kelly, R. F.; McCoy, W. F. (2001) Reaction of acylated homoserine lactone bacterial signaling molecules with oxidized halogen antimicrobials. *Appl. Environ. Microbiol.* 67(7), 3174-3179.

Allain, E. J.; Borchardt, S. A.; Michels, J. J.; McCoy, W. F. (2000) Interaction between acylated homoserine lactone signaling molecules and halogen biocides – a possible mechanism for biofilm control. Poster presented at Biofilms 2000 ASM Conference, Big Sky, Montana.

Michels, J. J.; Allain, E. J.; Hu, P.; Borchardt, S. A.; McCoy, W. F. (2000) Identification of the degradation pathway for acylated homoserine lactone bacterial signal molecules by halogenated oxidizing biocides using HPLC with photodiode array and APCIMS detection. *J. Chromatography* 898(2), 153-165.

Yang, S.; McCoy, W. F.; Allain, E. J.; Myers, E. R.; Dallmier, A. W. (2000) Preparation of stabilized bromine solutions used for biofouling control in water systems. PCT Int. Patent Appl.

Zong, Q; Allain, E. J.; Hager, L. P. (1997) Expression of recombinant chloroperoxidase. *FASEB Journal* 11(9).

Allain, E. J. (1997) Enantioselective epoxidation of alkenes by chloroperoxidase and the development of a chloroperoxidase expression system. Ph.D. Thesis, University of Illinois at Urbana-Champaign.

Hager, L. P.; Allain, E. J. (1994) Selective epoxidation of alkenes by chloroperoxidase. US Patent 5,358,860.

Allain, E. J.; Hager, L. P.; Deng, L.; Jacobsen, E. N. (1993) Highly enantioselective epoxidation of disubstituted alkenes with hydrogen peroxide catalyzed by chloroperoxidase. *J. Am. Chem. Soc.* 115 4415-16.

MEMBERSHIPS

- American Chemical Society
- Mathematical Association of America