

Beth (Ficek) Rundlett, Ph.D.

Email: beth-rundlett@uiowa.com

Linkedin: www.linkedin.com/in/bethrundlett

Education

University of Iowa, Department of Chemical Engineering, Iowa City, Iowa

Doctor of Philosophy in Chemical Engineering, 2003-May 2008, GPA: 3.96

Honors: Vetter Graduate Service Award 2007

National Science Foundation Graduate Research Fellowship 2003-2006

Bachelor of Science in Chemical Engineering, 1998-2003, GPA: 3.60

Honors: Alexander Engineering Scholarship 2000, 2001

Clements Engineering Scholarship 1999

Professional Experience

University of Iowa, Department of Chemical Engineering, Iowa City, IA

Associate Professor of Practice, 2018-Present

- Teach a variety of chemical engineering courses in both traditional lecture and “flipped classroom” styles to enrich students learning
- Direct, organize, and supervise all undergraduate teaching laboratories to ensure safe, quality training for students

Stratasys, Eden Prairie, MN

Senior Additive Manufacturing Research Engineer, Aerospace, Automotive, Defense Division, 2017-2018

- Evaluated external research opportunities for technical feasibility, manufacturing capability, and prioritization based on company’s long-term goals
- Managed external research collaborations to ensure deliverables are achieved within designated timelines
- Collaborated with multiple organizations (ASTM, SAE, American Makes) to produce universal standards for additive manufacturing

Katecho, Des Moines, IA

Director, Hydrogel Department, 2014-2017

- Managed hydrogel team responsible for formulating and manufacturing hydrogel designs that fulfilled customers’ particular medical device needs including unique device surfaces, specialized cosmetic additives, and increased robustness
- Doubled annual output by analyzing and redesigning hydrogel manufacturing to improve process efficiency, repeatability, and quality
- Developed and oversaw company’s safety program for 500 employees including training, OSHA/EPA/DOT compliance, waste disposal, and emergency protocols.
 - Hazwopper, DOT, CPR, AED, & BBP trained

DSM Functional Materials, Elgin, IL

Senior Scientist, SOMOS Stereolithography/3D printing Division, 2013-2014

- Formulated stereolithography resins to fulfill specific design goals such as low viscosity, increased speed, and high T_g
- Managed scale-up of new product manufacturing processes and quality control testing
- Followed project management processes to efficiently develop products with accelerated timeframes

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DSM Functional Materials, Elgin, IL

Senior Scientist, Fiber Optics Division, 2011-2013

- Formulated UV curable fiber optic coatings for improved physical properties, faster processing, and alternative processing including LED initiated curing
- Defined scope, deliverables, and timelines for multiple projects coordinating with product manager, R&D manager, and chemists
- Monitored and updated project progress to ensure project specifics were documented, auditable, and achieved within the defined timeframe

Senior Scientist, SOMOS Stereolithography Division, 2008-2011

- Planned and analyzed *in vivo* and *in vitro* testing of medical device materials including cytotoxicity (ISO 10993-5) and sensitization and irritation (ISO 10993-10)
- *Awarded "Top Performer in DSM" for Quarter 4, 2010*
- Managed quality control and manufacturing processes of four product lines
- Designed a new in-process color adjustment significantly decreasing failure rates

Interim R&D manager, Floor Coatings Division, 2011

- Led research division to develop alternative cure floor coatings
- Ensured R&D project specifics were defined and completed within the set timeframes
- Monitored and updated business team on R&D projects' progression

University of Iowa, Department of Chemical Engineering, Iowa City, IA

Ph.D. Candidate, 2005-2008

Collaboration: Toyota Technical Center, Materials Development Division, Ann Arbor, MI

Thesis Title: Cationic Photopolymerizations: Active Center Lifetimes and Mobility

- Demonstrated the ability of cationic photopolymerization to "shadow cure," that is to polymerize non-illuminated regions through active center migration
- Developed a novel technique for the complete cure of coatings on three-dimensional objects without the use of elaborate lighting schemes
- Mathematically modeled active center photo-generation in thick and thin coatings

Senior Laboratory Assistant, 2004-2005

Collaboration: 3M, ESPE Dental Products Division, St. Paul, MN

Project Title: Hybrid Cationic/Free Radical Photopolymerizations of Acrylates and Epoxides

- Investigated formulations and reaction kinetics of multiple photoinitiation systems to create and control multi-physical stages in hybrid polymers

Iowa City Kickers Soccer League, Iowa City, IA

Summer Soccer Camp Director. Summer 2005-2007

- Designed a week long camp to teach 100+ children, grades (K-6), the basis of soccer through drills, games, and demonstrations
- Interviewed, hired, and supervised approximately 10 camp coaches
- Designed and directed annual two hour clinic for adult coaches on the basics of coaching soccer

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International Experience

Materialise Collaboration Assignment, 2010

Materialise, Lueven, Belgium

- Developed stereolithography resin with high impact properties that could work in proprietary machines with curtain re-coat systems

DSM Research Assignment, February, March 2009

DSM Research, Geleen, Netherlands

- Investigated the potential of near-IR/Real time-DMA equipment to monitor cure kinetics and rheology

Service Mission Trip, March 2003

University of Kansas Outreach Program, Saltillo, Mexico

- Aided over 20 families and assisted two local orphanages
- Facilitated improved access to medical supplies, shelter, and food sources for five disadvantaged communities

Global Engineering Education Exchange, Spring 2001

Technical University of Denmark, Copenhagen, Denmark

- Completed engineering courses including chemical process control, risk assessment in chemical engineering, and advanced computer programming

Professional Organizations and Affiliations

Society of Automotive Engineers (SAE), 2017-Present

- AMS AM Additive Manufacturing Standards Committee, 2017-Present

American Section of International Association for Testing Materials (ASTM), 2017-Present

- F42 on Additive Manufacturing Committee, 2017-Present

RadTech North America, 2008-Present

- Board Member, 2014-2017
- Co-chair of UV LED Technology Committee, 2013-2014

Industrial/University Cooperative Research Center for Photopolymerization, 2004-2014

- DSM Representative, 2008-2014
- Coordinated and hosted the 2013 Spring Conference
- Coordinated the 2007 Spring Conference

Patents

US Patent 9951198 April 24, 2018.

Stabilized Matrix-Filled Liquid Radiation Curable Resin Compositions For Additive Fabrication. M He, **B Rundlett**, K Ren, C Liu, T.Y. Lee, B Seurer, R Papachristopoulos:

US Patent 9927704, March 27, 2018.

Liquid Radiation Curable resins capable of curing into layers with selective visual effects and methods for the use thereof. **B Ficek**, J Southwell, B. Register:

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Patents (Continued)

US Patent 9864274, Jan. 9, 2018.

Liquid Radiation Curable resins capable of curing into layers with selective visual effects and methods for the use thereof. **B Rundlett**, J Southwell, B. Register:

US Patent 9861452, Jan. 9, 2018.

Low-Viscosity Liquid Radiation Curable Dental Aligner Mold Resin Compositions For Additive Manufacturing. **B Rundlett**:

US Patent 9274429, March 1, 2016.

Method for Producing layered Materials using Long-lived Photo-induced Active Centers. CG Templeman, AB Scranton, **BA Rundlett**, C. Hoppe:

US Patent 9228073, Jan. 5, 2016.

Stabilized Matrix-Filled Liquid Radiation Curable Resin Compositions For Additive Fabrication. M He, **B Rundlett**, K Ren, C Liu, T.Y. Lee:

US Patent 8993042, March 31, 2015

Method for Determining the Production Parameters for a Substrate Coating Process. CG Templeman, AB Scranton, **BA Ficek**, C. Hoppe:

US Patent 8197911, June 12, 2012.

Method of Applying Polymer Coating to a Substrate. CG Templeman, EM Leonard, **BA Ficek**, AB Scranton:

Publications

B Rundlett: UV curing in a 3-Dimensional World. *Radtech Report* 3 (2013) 21-23.

L Magwood, **BA Ficek**, CN Coretsopoulos, AB Scranton: Polymerization Kinetics and Physical Property Development in Hybrid Radical/Cationic Photopolymerizations in Basics and Applications of Photopolymerization Reactions. Editor: JP Fouassier & X Allonas, (2010) 213-224.

C Hoppe, **BA Ficek**, HS Eom, AB Scranton: Cationic photopolymerization of epoxides containing carbon black nanoparticles. *Polymer*, 51 (2010) 6151-6160

B Ficek, A Thiesen, AB Scranton: Cationic Photopolymerizations of Thick Polymer Systems: Active Center Lifetime and Mobility. *European Polymer Journal*. 44 (2008) 98-105

NS Kenning, **B Ficek**, C Hoppe, AB Scranton: Spatial and temporal evolution of the photoinitiation rate for thick polymer systems illuminated by polychromatic light: Selection of efficient photoinitiators for LED or mercury lamps. *Polymer International*. 57 (2008) 1134-1140

BA Ficek, AB Scranton: IUCRC completes its seventh year and receives an ACS award. *RadTech Report*, May/June Issue (2007) 38-40.

R Huang, **BA Ficek**, SO Glover, AB Scranton: Effect of water in cationic photopolymerizations: reversible inhibition. *RadTech Report*, May/June Issue (2007) 30-35.

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Publications (Continued)

BA Ficek, L Magwood, C Coretsopoulos, AB Scranton: Stage-curable hybrid radical/cationic photopolymerizations in Photochemistry and UV Curing: New Trends. Editor: J.P. Fouassier, (2006) 294-300.

JD Oxman, DW Jacobs, MC Trom, V Sipani, **B Ficek**, AB Scranton: Evaluation of initiator systems for controlled and sequentially curable free radical/cationic hybrid photopolymerizations. *Journal of Polymer Science Part A: Polymer Chemistry*. 43 (2005) 1747-1756.

Posters and Presentations

B. Rundlett, “Stratasys Today’s Advancements to Tomorrow’s Innovations,” SAE AMS AM Additive Manufacturing Conference, Hønefoss, Norway, April 2018

B. Rundlett, “The Design and Application of Hydrogels,” Radtech Technology Conference, Chicago, IL, May 2016

B. Rundlett, “Photoinitiator Selection,” Radtech Technology Conference, Chicago, IL, April 2012

B.A. Ficek, A. Thiesen, A.B. Scranton, “Lifetimes and Mobility of Cationic Active Centers,” Radtech International UV and EB Curing Technology Expo & Conference, Chicago, IL, May 2008

B. Ficek and A. B. Scranton, “Photopolymerization of Thick Systems: Cationic Active Centers Lifetime and Mobility,” Photopolymerization Fundamentals Conference, Breckenridge, CO, June 2007

B. Ficek and A. B. Scranton, “Cationic Photopolymerization: Long-Lived Cationic Active Centers” Materials Research Society Spring Conference, San Francisco, CA, April 2007

B. Ficek and A. B. Scranton, “Hybrid Cationic/Free Radical Photopolymerizations of Acrylates and Epoxides,” Photopolymerization Center- Industry/University Cooperative Research Center Bi-Annual Meeting, Breckenridge, CO, June 2005.

B. Ficek and A. B. Scranton, “Hybrid Cationic/Free Radical Photopolymerizations of Acrylates and Epoxides,” – Poster Session College of Engineering Annual Research Open House, University of Iowa, Iowa City, IA, April 2005.

B. Ficek, K. Jain, P. Rasmussen, D. G. Rethwisch, A.B. Scranton, “Microemulsions of Soybean Oil” – Poster Session College of Engineering Annual Research Open House, University of Iowa, Iowa City, IA, April 2004.

B. Ficek and A. B. Scranton, “Hybrid Cationic/Free Radical Photopolymerizations of Acrylates and Epoxides,” Photopolymerization Center- Industry/University Cooperative Research Center Bi-Annual Meeting, Boulder, CO, March 2004.

B. Ficek, K. Jain, P. Rasmussen, D. G. Rethwisch, A.B. Scranton, “Microemulsions of Soybean Oil” – Poster Session AIChE Annual Meeting, San Francisco, CA, November 2003.