

# Katy N Newlin, PhD

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## EDUCATION

University of Houston, Department of Chemical and Biomolecular Engineering  
Ph.D. in Chemical Engineering, Awarded the Best Dissertation

Houston, TX  
May 2017

University of Louisville, J.B. Speed School of Engineering  
B.S. in Chemical Engineering, with High Honors

Louisville, KY  
May 2012

## RELEVANT EXPERIENCE

### Massachusetts Institute of Technology (MIT)

Cambridge, MA  
2017 – 2018

Postdoctoral Research Fellow

Advisors: Drs. Bob Langer and Dan Anderson | Affiliations: David H. Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology, Boston Children's Hospital, Harvard Medical School

- Controlled the spatial organization of cells for organ regeneration by building colloidal co-crystals as 3D bioscaffolds
- Designed a biocompatible, soft-responsive, retrievable device containing glucose-monitoring and insulin-secreting cells for human cell replacement therapies
- Harnessed mechanistic driving forces at cell-surface interfaces to alter cell migration by chemically modifying biocompatible materials, tailoring surface geometries, and imposing environmental stimuli
- Performed survival in vivo surgeries, both subcutaneous and intraperitoneal implantations, on animal models for device implantation and retrieval with designed pancreatic scaffolds housing stem cells or isolated islets to treat Type 2 diabetes

### University of Houston, Department of Chemical and Biomolecular Engineering

Houston, TX  
2013 – 2017

Doctoral Researcher

Co-advised: Drs. Peter Vekilov and Jeffrey Rimer

Dissertation Title: "Deciphering the Molecular Interactions between Antimalarials and Hematin Crystal Surfaces"

- Formulated quantitative parameters for novel antimalarial design to combat malaria parasite drug resistance
- Designed a physiological growth environment that produced hematin crystals > 100x than prior methods
- Identified the growth pathway for hematin crystallization which revealed specific crystal sites for drug binding
- Quantified thermodynamics and kinetics for heme detoxification underlying malaria pathophysiology
- Determined antimalarial drug-binding specificity to hematin crystal surfaces that categorizes the inhibitory modes of antimalarial action as a platform for drug design
- Identified target sites for therapeutic binding on hematin crystals by in situ AFM and revealed the first observation that hematin crystals grow by 2D nucleation and layer spreading
- Collaborated with Dr. Grattoni at Methodist Hospital Research Institute during my NIH Fellowship for drug encapsulation; Dr. Palmer at the University of Houston on computational assessment of drug modes of binding; Dr. Kahr at NYU on optical properties of hematin crystals

### Research Consulting for Environmental BCorp and Nonprofit Foundation

Remote  
2021 - Present

Researcher for Environmental StartUp Voice for the Trees Foundation

- Investigated and laid out steps for initiating a pending B Corp Certification and future micro-enterprise company certification
- Established nonprofit partnerships for leading reforestation foundations locally, nationally (USA), and globally
- Generated brand and subcategory names for the for-profit and nonprofit sides of the company for advertisement and branding
- Sought out sustainable products as replacements for conventional products to align with company goals

### Scientific Consulting

Louisville, KY  
2020

Research and Development Lead Scientist for FreshFry LLC.

- Developed absorbent materials for FreshFry LLC. to enhance edible oil lifetime with simultaneous reduction of production cost and ease of material reliability
- Conducted fundamental research for material identification and modified properties for existing / novel materials
- Performed data analysis to decouple adsorptive and absorptive properties as a function of temperature cycles
- Created a custom bench-scale process for material performance pre-screening
- Designed custom laboratory and equipment layout for a successful start-up

**Alkermes***Waltham, MA**Scientist**2018 – 2019*

- Developed therapeutics to treat opioid and alcohol dependence, Schizophrenia, and Alzheimer's within design spaces that were suitable for multiple required delivery routes bracketed by optimal tolerability levels
- Tuned material properties of pipeline pharmaceuticals to control bioavailability and plasma release profiles, while alleviating local toxicity through novel hydrogel applications to alter diffusion parameters
- Designated project team lead to design a next-generation therapeutic for extending drug release beyond a single month – redesigned the process and material properties by employing drug encapsulation methodologies to achieve our target goal of a two month long-acting injectable
- Designed a microencapsulation nasal spray formulation to penetrate the blood-brain barrier, with higher bioavailability compared to IV plasma levels, to successfully achieve a formulation to outcompete narcotic compounds in an overdose crisis as an emergency lifesaving treatment
- Altered formulation spaces to produce single and co-crystals from challenging oiling-out therapeutics that were previously deemed inaccessible to create long-acting injectable therapeutics for severe epilepsy cases in youth

**NASA Glenn Research Center***Cleveland, OH**Undergraduate Student Research Project Intern**2010*

- Developed a synthesis route for aluminosilicates aerogels to incorporate metals into hydrogels that resulted in the testing of material properties: improved stability while enhancing thermal resistance
- Collaborated with engineers and organic chemists to optimize the design parameters for synthesized materials (density, porosity, and surface area) by systematically varying the synthesis parameters and compositions
- Monitored material morphology which revealed a correlation between metal incorporation and desirable thermal resistivity

**University of Louisville, Department of Chemistry***Louisville, KY**Undergraduate Researcher**2010*

- Organic synthesis of medical drugs to target breast cancer
- Designed a synthesis procedure to produce a new, synthetic compound which was previously unsuccessful; determined the compound solubility across a variety of ideal solvents

**University of Louisville, Department of Biology***Louisville, KY**Undergraduate Researcher**2008 – 2012*

- Assessed the variability of adiponectin levels across a variety of mice organs/tissues by quantifying the concentration of adipose hormone adiponectin by ELISA assays
- Received independent grants for research on the study of mRNA synthesis for adiponectin in adipose tissue

**Brown-Forman Corporation Headquarters***Louisville, KY**Student Engineer**2011*

- Designed an adiabatic chill-filtration system for Jack Daniels® products; successful project implementation for full scale-up of the chill filtration system at the production site that resulted in cost savings by decreasing the amount of off-specification product
- Produced batch reactions of beverages in the research and development pilot plant scale for global production
- Researched resin/carbon treatments for columns to improve production quality between batches
- Presented results to the director of the Department of Research and Development

**Kentucky Pollution Prevention Center (KPPC)***Louisville, KY**Student Engineer**2010*

- Provided direct support for the reduction of pollution and energy consumption for projects pertaining to companies throughout the state of Kentucky (industry and commercial facilities)
- Analyzed annual energy consumption from on-site assessments; collected operating parameters for the analysis of process efficiency in order to pinpoint areas of improvement for full facilities
- Optimized energy expenditure for pumps, HVAC systems, and specific company equipment quantitatively

## TECHNIQUES

**Microscopy** | Air and in situ AFM (lattice imaging, adhesion and chemical force spectroscopy), SEM, Optical, Confocal, TEM sample preparation, and sectioning

**Spectroscopy** | UV-visible, FTIR, Raman, and NMR/qNMR (H-NMR, C-NMR, 2D-NMR, COSY)

**Analytical** | LC-MS, HPLC, TGA, IGC, XRD, DLS, SAXS

**Crystallization** | EasyMax Synthesis Reactor Systems, Crystal 16 Crystallization Systems

**Biological** | Electrospray encapsulation, Cell culture (HEK 293, HUH 7, beta replacement cell lines RIN 5F, islet/human pancreatic stem cells), GSIS, ELISA, Small animal surgeries (subcutaneous and intraperitoneal implantations)

**Programs** | Diamond Crystal and Molecular Visualization/Diffrac.Eva, Trios, MestReNova, Nanoscope Analysis, Origin, Image J, Canvas, NuGenesis ELN

**Certifications** | IACUC/CAC Animal Handling Certification (mice/rats), Laser Safety, Biological Safety BL1/2

**Teaching Certifications** | TEFL 120-hr Advanced Course

## HONORS AND AWARDS

- 2019 Selected to attend the Society of Women Engineers Diversity and Inclusion Fuels Innovation in STEM congressional outreach day at Capitol Hill in Washington D.C., Alkermes, Washington D.C.
- 2017 Best Dissertation Award College-Wide, University of Houston, Houston, TX
- 2016 Women's Initiative Committee (WIC) Travel Award, San Francisco, CA
- 2016 Gordon Research Seminar (GRS) Travel Award, Girona, Spain
- 2016 Cullen Graduate Fellowship Travel Grant (CGFTG), Awarded for travel to the Biomineralization GRC in Girona, Spain by the University of Houston
- 2016 American Institute of Chemical Engineers (AIChE) Separations Division Graduate Research Award, San Francisco, CA
- 2016 Gordon Research Seminar (GRS) Poster Selected for Oral Presentation, Girona, Spain
- 2015 Gordon Research Conference (GRC) Travel Award, Biddeford, ME
- 2015 Gordon Research Conference (GRC) Poster Selected for Oral Presentation, Biddeford, ME
- 2014 GRASP Talks Finalist, University of Houston, Graduate School, Houston, TX
- 2014 GRASP Talks Training Award, Graduate Research and Scholarship Projects (GRASP), University of Houston, Graduate School, Houston, TX
- 2014 Future Faculty Program (FFP), University of Houston, Graduate Training Program (1.5-year teaching and research-based training with associated courses), awarded travel funding, Houston, TX
- 2013 Poster Award Contest Winner, 23rd Keck Annual Research Conference, Houston, TX
- 2013 NIGTP Keck Center Fellowship Funding, Gulf Coast Consortia (GCC), Nanobiology Interdisciplinary Graduate Training Program (NIGTP) sponsored by the National Institute of Health (NIH)
- 2012 Dean's List, University of Louisville, Louisville, KY
- 2008 – 2012 Trustees' Scholarship Program: President's Scholarship Program, Governor's Scholars Program University of Louisville; full tuition awarded based on academic achievement; renewed for eleven semesters in engineering based on academic standing
- 2008 – 2012 KEES Award, awarded for four years of scholarship based on academic standing and ACT score

## PUBLICATIONS

*(Katy N. Newlin was previously Katy N. Olafson)*

- 19. Ma, W., Balta, V.A., West, R., **Newlin, K.N.**, Miliani, O.S., Sullivan, D.J., Vekilov, P.G., Rimer, J.D., A Second Mechanism Employed by Artemisinins to Suppress Plasmodium Falciparum Hinges on Inhibition of Hematin Crystallization, *J. Biol. Chem.* (2020) 100123
- 18. Farah, S., Doloff, J.C., Muller, P., Sadraei, A., Han, H.J., **Olafson, K.N.**, Vyas, K., Tam, H.H., Hollister-Lock, J., Kowalski, P.S., Griffin, M., Meng, A., McAvoy, M., Graham, A.C., McGarrigle, J., Oberholzer, J., Weir, G.C., Greiner, D.L., Langer, R.S., Anderson, D.G., Long-term Implant Fibrosis Prevention in Rodents and Non-human Primates using Crystallized Drug Formulations, *Nat. Mater.* (2019)
- 17. **Olafson, K.N.**, Clark, J., Vekilov, P.G., Palmer, J.C., Rimer, J.D., Structuring of Organic Solvents at Solid Interfaces and Ramifications for Antimalarial Adsorption on -Hematin Crystals, *ACS Appl. Mater. Interfaces*. 10 (2018) 29288-29298
- 16. Fenton, O., **Olafson, K.N.**, Pillai, P., Mitchell, M., Langer, R.S., Advances in Biomaterials for Drug Delivery, *Adv. Mater.* 30 (2018) 1705328
- 15. **Olafson, K.N.**, Rimer, J.D., Vekilov, P.G., Early Onset of Kinetic Roughening Due to Step Identify Loss in Hematin Crystallization, *Phys. Rev. Lett.* 119 (2017) 198101
- 14. Polling-Skutvik, R., **Olafson, K.N.**, Narayanan, S., Stingaciu, L., Faraone, A., Conrad, J.C., Krishnamoorti, R., Confined dynamics of Grafted Polymer Chains in Solutions of Linear Polymer, *Macromolecules*. 50 (2017) 7372 – 7379

13. **Olafson, K.N.**, Nguyen, T.Q., Vekilov, P.G., Rimer, J.D., Deconstructing Quinoline-Class Antimalarials to Identify Fundamental Physicochemical Properties of Hematin Crystal Growth Inhibitors, *Chem. Eur. J.* 23 (2017) 13638 – 13647
12. **Olafson, K.N.**, Nguyen, T.Q., Rimer, J.D., Vekilov, P.G., Antimalarials Inhibit Hematin Crystallization by Unique Drug-Surface Site Interactions, *Proc. Natl. Acad. Sci. U.S.A.* 114 (2017) 7531 – 7536
11. **Olafson, K.N.**, Li, R., Alamani, B.G., Rimer, J.D., Engineering Crystal Modifiers: Bridging Classical and Nonclassical Crystallization, *Chem. Mater.* 28 (2016) 8453 – 8465.  
*Artwork selected for the cover.*
10. Vekilov, P.G., Chung, S., **Olafson, K.N.**, Shape Change in Crystallization of Biological Macromolecules, *MRS Bulletin* (2016) 375 – 3809.
9. **Olafson, K.N.**, Ketchum, M.A., Rimer, J.D., Vekilov, P.G., Molecular Mechanisms of Hematin Crystallization from Organic Solvent, *Cryst. Growth Des.* 15 (2015) 5535 – 5542
8. Vekilov, P.G., Rimer, J.D., **Olafson, K.N.**, Ketchum, M.A., Lipid or Aqueous Medium for Hematin Crystallization, *Cryst. Eng. Comm.* 17 (2015) 7790 – 7800  
*Article selected as a highlight article. Artwork selected for the cover.*
7. **Olafson, K.N.**, Ketchum, M.A., Rimer, J.D., Vekilov, P.G., Mechanisms of Hematin Crystallization and Inhibition by the Antimalarial Drug Chloroquine, *Proc. Natl. Acad. Sci. U.S.A.* 112 (2015) 4946 – 4951
6. **Olafson, K.N.**, Rimer, J.D., Vekilov, P.G., Growth of Large Hematin Crystals in Biomimetic Solutions, *Cryst. Growth Des.* 14 (2014) 2123 – 2127
5. Hurwitz, F.I., Gallagher, M., Olin, T.C., Shave, M.K., Ittes, M.A., **Olafson, K.N.**, Fields, M.G., Guo, H., Rogers, R.B., Optimization of Alumina and Aluminosilicate Aerogel Structure for High-Temperature Performance, *Int. J. Appl. Glass Sci.* 5 (2014) 1 – 11
4. Ketchum, M.A., **Olafson, K.N.**, Petrova, E.V., Rimer, J.D., Vekilov, P.G., Hematin Crystallization from Aqueous and Organic Solvents, *J. Chem. Phys.* 139 (2013) 1 – 9
3. Hurwitz, F.I., Guo, H., Rogers, R.B., Sheets, E.J., Miller, D.R., **Newlin, K.N.**, Shave, M.K., Palczar, A.R., Cox, M.T., Influence of Ti Addition of Boehmite-derived Aluminum Silicate Aerogels: Structure and Properties, *J. Sol-Gel Science and Technology.* 64 (2012) 0928-0707 (367 – 374)
2. Hurwitz, F.I., Guo, H., **Newlin, K.N.**, Influence of Boehmite Precursor on Aluminosilicate Aerogel Pore Structure, Phase Stability and Resistance to Densification at High Temperatures, NASA Glenn Research Center (2011)
1. Hurwitz, F.I., Guo, H., Sheets, E.J., Miller, D.R., **Newlin, K.N.**, Tailoring of Boehmite-Derived Aluminosilicate Aerogel Structure and Properties: Influence of Ti Addition, *MRS Proceedings* 1306, MRS10-1306-bb10-03 (2010)

## AWARDED GRANTS

1. Basal Plasma Levels of Adiponectin in Rats. Newlin, K.N.. Undergraduate Research Grant, Office of the Vice-President for Research, \$300, 10/15/09-10/14/10.
2. Expression of Adiponectin in Brown Adipose Tissue. Newlin, K.N.. Undergraduate Research Grant, Office of the Vice-President for Research, \$500, 8/2/11-8/1/12.

## INVITED TALKS AND POSTERS

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| <p>2019 Sustainability Seminar<br/>Cambridge Public Library Selected Presentation, Newlin, K.N., Everyday Actions to Build a Sustainable World, (Oral Presentation), Co-host Sponsorship: Massachusetts Sierra Club (Nonprofit), 350 Inc. (Nonprofit), June 10th, 2019</p> <p>2018 McKinsey&amp;Co, Spark Spark Event Series</p> <p>2018 McKinsey&amp;Co, Spark Symposium</p> <p>2016 Southwest Regional Meeting (SWRM) of the American Chemical Society<br/>Aggregation of Biological Molecules Session, Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Molecular Interactions that Govern Antimalarial Drugs Selectively Binding to Hematin Crystal Surface Sites, (Oral Presentation) November 10th, 2016</p> <p>2016 Gordon Research Seminar (GRS) – Biomineralization<br/>Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Is the Sum Greater than the Parts? Elucidating the Molecular Interactions between Antimalarial Drugs and Hematin Crystal Surfaces, (Oral Presentation) August 13th, 2016</p> <p>2016 Research First Look Showcase – University of Houston<br/>Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Decoding the Molecular Recognition between Antimalarials and Hematin Crystal Surfaces (Poster Presentation) May 4th, 2016</p> <p>2015 Society of Plastics Engineers (SPE), University of Houston Local Chapter<br/>Olafson, K.N., Elucidating the Molecular Interactions at a Solid-Liquid Interface to Combat Malaria, (Oral Presentation) November 17th, 2015</p> | <p><i>Cambridge, MA</i></p> <p><i>Cambridge, MA</i></p> <p><i>Cambridge, MA</i></p> <p><i>Galveston, TX</i></p> <p><i>Girona, Spain</i></p> <p><i>Houston, TX</i></p> <p><i>Houston, TX</i></p> |
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- 2015 Rice University, 25th Keck Annual Research Conference *Houston, TX*  
25th Anniversary Celebration, Olafson, K.N., Grattoni, A., Rimer, J.D., Vekilov, P.G.. Elucidating the Fundamentals of Hematin Crystallization to Combat Malaria, (Poster Presentation) October 15th and 16th, 2015
- 2015 Gordon Research Conference (GRC) – Crystal Growth and Assembly *Biddeford, ME*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Are All Antimalarials Created Equal? Modes of Antimalarial Drug Inhibition in Hematin Crystallization, (Oral Presentation) June 30th, 2015
- 2014 Keck Seminar – Rice University *Houston, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Growth Mechanisms of -hematin in a Biomimetic Environment, (Oral Presentation) March 28th, 2014

## PRESENTATIONS AND POSTERS

- 2017 Gordon Research Conference (GRC) – Crystal Growth and Assembly *Biddeford, ME*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Deconstructing Molecular Interactions between Antimalarials and Hematin Crystal Surfaces (Poster Presentation) June 25th – 30th, 2017
- 2017 Gordon Research Conference (GRS) – Crystal Growth and Assembly *Biddeford, ME*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Deciphering the Molecular Interactions between Antimalarials and Hematin Crystal Surfaces (Poster Presentation) June 23rd – 25th, 2017
- 2016 American Institute of Chemical Engineers (AIChE) Annual Conference *San Francisco, CA*  
*Solid-Liquid Interfaces Session*  
Olafson, K.N., Interactions between Antimalarials and Hematin Crystal Surface Sites Determine the Mode of Inhibition, (Oral Presentation 610f) November 14th, 2016  
*Nucleation and Growth Session*  
Olafson, K.N., Application of Hematin Crystallization by Classical Mechanisms towards Understanding Antimalarial Drug Modes of Action, (Oral Presentation 659g) November 14th, 2016
- 2016 University of Houston, 31st Organization of Chemical Engineering Graduate Students Annual Symposium *Houston, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Deconstructing Antimalarial Drugs to Understand their Molecular Recognition for Hematin Crystal Surfaces, (Oral Presentation) September 23rd, 2016
- 2016 Gordon Research Conference (GRC) – Biomineralization *Girona, Spain*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Modes of Antimalarial Drug Binding During Hematin Crystallization (Poster Presentation) August 14th – 19th, 2016
- 2015 American Institute of Chemical Engineers (AIChE) Annual Conference *Salt Lake City, UT*  
*Solid-Liquid Interfaces Session*  
Olafson, K.N., Molecular Interactions at a Solid-Liquid Interface Determine the Inhibition Mechanism of Hematin Crystallization by Antimalarial Drugs, (Oral Presentation 610f) November 11th, 2015  
*Particle Formation and Crystallization Processes from Liquids, Slurries, and Emulsions Session*  
Olafson, K.N., Mechanisms of Hematin Crystallization and Inhibition in Biomimetic Solutions, (Oral Presentation 659g) November 12th, 2015
- 2015 University of Houston, 30th Organization of Chemical Engineering Graduate Students Annual Symposium *Houston, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Modes of Antimalarial Drug Inhibition, (Poster Presentation) September 26, 2015
- 2015 Rice University, Texas Soft Matter Meeting *Houston, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Classification of Antimalarial Drug Inhibition, (Oral Pres.) August 21, 2015
- 2015 Gordon Research Conference (GRC) – Crystal Growth and Assembly *Biddeford, ME*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Modes of Antimalarial Drug Inhibition in Hematin Crystallization (Poster Presentation) July 1st – 2nd, 2015
- 2014 American Institute of Chemical Engineers (AIChE) Annual Conference *Atlanta, GA*  
*Engineering Sciences and Fundamentals Session*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Mechanisms of -hematin Crystallization and Inhibition by Antimalarials, (Oral Presentation 720f) November 20th, 2014
- 2014 Rice University, 24th Keck Annual Research Conference *Houston, TX*  
*Quantitative Synthetic Biology*  
Olafson, K.N., Grattoni, A., Rimer, J.D., Vekilov, P.G.. Mechanisms of Hematin Crystallization and Inhibition by Antimalarial Growth Modifiers in a Physiological Environment, (Poster Presentation) November 7th, 2014
- 2014 University of Houston, 29th Organization of Chemical Engineering Graduate Students Annual Symposium *Houston, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Mechanism of Hematin Crystallization and Modes of Antimalarial Drug Inhibition, (Oral Presentation) September 26th, 2014
- 2014 University of Texas, Texas Soft Matter Meeting *Austin, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Mechanism of Hematin Crystallization, (Oral Presentation) August 22nd, 2014

- 2014 Rice University, International Year of Crystallography: Structure Matters *Houston, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Growth Mechanisms of -hematin Crystals, Structure Matters (Poster Presentation)  
February 14th, 2014
- 2013 Rice University, 23rd Keck Annual Research Conference *Houston, TX*  
*Therapeutic Monoclonal Antibodies – A Multidisciplinary Challenge*  
Olafson, K.N., Grattoni, A., Rimer, J.D., Vekilov, P.G.. Classical and Non-classical Growth Mechanisms of -hematin Crystals,  
Received a Pre-doctoral Poster Award (Poster Presentation) November 8th, 2013
- 2013 University of Houston, 28th Organization of Chemical Engineering Graduate Students Annual Symposium *Houston, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Molecular Mechanism of Hematin Crystallization, (Poster Presentation) September  
27th, 2013
- 2013 Texas A&M, Texas Soft Matter Meeting *College Station, TX*  
Olafson, K.N., Rimer, J.D., Vekilov, P.G.. Mechanisms of -hematin Crystal Growth by in-situ AFM, (Oral Presentation)  
August 12th, 2013
- 2012 Kentucky State Capital, 11th Posters-at-the-Capitol *Frankfort, KY*  
Wagoner, T. and Newlin, K.N.. Gender Differences in a Hormone Related to Obesity, (Poster Presentation; One of fifteen  
UofL undergraduate students selected to present) January 26th, 2012
- 2011 University of Louisville, Undergraduate Research Symposium *Louisville, KY*  
Wagoner, T., Guardiola-Bright, J., Newlin, K.N., and Steffen, J.M.. Gender Differences in Serum and Adipose Tissue  
Adiponectin in Rats, (Poster Presentation)
- 2011 American Chemical Society National Meeting & Exposition *Anaheim, CA*  
Hurwitz, F.I., Guo, H., Newlin, K.N.. Influence of Boehmite Precursor on Aluminosilicate Aerogel Pore Structure, Phase  
Stability and Resistance to Densification at High Temperature, (Poster Presentation)
- 2010 University of Louisville, Undergraduate Research Symposium *Louisville, KY*  
Guardiola-Bright, J., Newlin, K.N., Steffen, J.M.. Gender Differences in Total and Multimeric Forms of Serum Adiponectin  
in Rats, (Poster Presentation)

## ACADEMIC EXPERIENCE

### OutSchool Educator

STEM Curriculum

Global designer and educator for individualized STEM field courses for children in the areas of crystal growth, surface tension, the  
Periodic Table, and phases of matter

*Remote*

*2020 – 2021*

### iTutorGroup Consultant

Teaching English as a Foreign Language

Global consultant for English as a second language to advance both individual and group clients. Lead classes from 1 – 1 to 1 – 6  
student groups using positive reinforcement and Total Physical Response (TPR)

*Remote*

*2020*

### Graduate Recruitment Coordinator

Department of Chemical and Biomolecular Engineering, University of Houston

Organized and hosted department-wide recruitment events for the incoming graduate class

*Houston, TX*

*2014 – 2017*

### Course Instructor for Experimental Methods Class

Department of Chemical and Biomolecular Engineering, University of Houston

Atomic Force Microscopy lecture and experimental demonstration, designed homework problems, exam questions, and assessed the  
knowledge of the student's ability to critically apply book knowledge to practical laboratory settings

*Houston, TX*

*2016*

### Thermodynamics Tutor

Department of Chemical and Biomolecular Engineering, University of Houston

*Houston, TX*

*2015*

### Teaching Assistant for Classical Thermodynamics

Department of Chemical and Biomolecular Engineering, University of Houston

*Houston, TX*

*2013 – 2014*

## OUTREACH AND VOLUNTEERING

- 2021 Invited as a returning panelist at the University of Louisville Chemical Engineering course to speak on non-traditional career paths as a chemical engineering major
- 2020 Invited as a returning panelist at the University of Louisville Chemical Engineering course to speak on non-traditional career paths as a chemical engineering major
- 2019 Alkermes Intern Presentation Series | Developed a team where interns are provided with a supportive environment to gain exposure to receiving and providing feedback in order to practice public speaking.
- 2019 Selected to attend the SWE Diversity and Inclusion Fuels Innovation in STEM congressional outreach day at Capitol Hill in Washington D.C. to meet with Congress members
- 2019 Society of Women Engineers (SWE) Member | 2017 – Present
- 2019 American Institute of Chemical Engineers (AIChE) Member | 2009 – Present | Local chapter president at the University of Louisville; annual attendance at national conferences for talks and posters; received awards at multiple AIChE conferences
- 2019 Invited to be a panelist at the University of Louisville by Dr. Willing for a Chemical Engineering course to speak on non-traditional career paths as a chemical engineering major
- 2019 Boston Global Women's Breakfast: Empowering Women in Chemistry Seminar with the 100th anniversary of IUPAC as a global initiative
- 2018 ThermoFisher Aspire Program | Organized a team of members to present state of the art equipment and a teaching program for the Langer Lab at MIT
- 2018 Reviewed a submitted manuscript for Applied Surface Science
- 2018 STEM | Invited as a panel member for Think Big! to inspire and discuss academic and industry avenues to pursue with primary school students
- 2017-18 Langer Lab Symposium | Selected to invite speakers from top tier universities, venture capitals, and national laboratories for regular seminar lectures for Bob Langer's research group at the Koch Institute for Integrative Cancer Research Center at MIT to broaden the research perspectives of lab members
- 2017 Shelby County Public Schools Astronomy Day | STEM outreach for elementary students to discuss the classification of comets, meteorites, etc., and developed methods to prevent a catastrophic event from impacting the Earth.
- 2017 Current Postdoctoral Board Member for the Department of Chemical Engineering
- 2017 STEM | Invited judge for the Massachusetts Junior Academy of Science Symposium at MIT
- 2017 Reviewed a submitted manuscript for Experimental Parasitology
- 2017 Invited to co-chair at the Gordon Research Seminar for CGD in the session "In Situ Characterization of Crystal Growth"
- 2016 Reviewed a submitted manuscript for the Journal of Crystal Growth
- 2016 Invited to co-chair the "Accelerated Discovery and Development of Inorganic Materials" event in the Materials Engineering and Sciences Division program for the Annual 2016 AIChE Conference
- 2016 Invited to co-chair the "Templated Assembly of Inorganic Nanomaterials" event in the Materials Engineering and Sciences Division program for the Annual 2016 AIChE Conference
- 2016 MIT-Lemelson Event | Demonstrated microscopy and light scattering techniques to visiting high school students for STEM
- 2016 Committee Member for the Student Success Task Force | Invited by the Vice Provost and Dean of Graduate School
- 2016 Energy Day Festival | Volunteered at the University of Houston Engineering educational booth with interactive demonstrations, including those that conveyed ideas pertaining to renewable energy sources, and other select STEM areas to our Houston youth, October 12th, 2016
- 2015 Women's Initiative Committee (WIC) American Institute of Chemical Engineers (AIChE) Annual Meeting Networking Luncheon | Salt Lake City, UT, November 9th, 2015
- 2015 Energy Day Festival | Participated in hosting the UH educational booth with interactive demonstrations, including those that conveyed ideas pertaining to renewable energy sources, and other select STEM areas to our Houston youth in Sam Houston Park, October 17th, 2015
- 2014 Women's Initiative Committee American Institute of Chemical Engineers Annual Meeting Networking Luncheon | Atlanta, GA, November 17th, 2014
- 2014 Rice University, International Year of Crystallography: Structure Matters | Educated undergraduate students on crystal growth using analogies (i.e., the addition of building Lego blocks to a tower) and conveyed the importance of STEM programs/higher education
- 2013 – 17 Society of Plastics Engineers (SPE) Member | Annually attended local conferences and presented posters
- 2013 – 15 Mentorship for Undergraduate Research Project | Tam Q. Nguyen completed independent research projects during his two-year project on hematin complexation in various media; received an outstanding poster award at the 2014 Undergraduate Research Day; successfully defended his honors thesis
- 2013 – 14 Mentorship for High School Research Project | Aman Patel initially began his competitive research project with me at the beginning of his project; accepted to attend undergraduate schooling at MIT
- 2011 – 12 American Institute of Chemical Engineers (AIChE) Local Chapter President | University of Louisville, Louisville, KY
- 2011 – 12 Invited Grader for Numerical Methods, J.B. Speed School | University of Louisville, Louisville, KY

2009 – 12 Honors Dormitory Resident Assistant | University of Louisville, Louisville, KY  
2007 Governor's Scholars Program (GSP) | Bellarmine University, Louisville, Kentucky

## PERSONAL INTERESTS

- Traveled throughout Canada, the U.S., and Mexico by bike and van
- Rock climber, backpacking and hiking, traveling
- Certified Yoga Instructor | 200 Hour Yoga Teacher Training (YTT)
- Piano player for 12 years; oboe player
- BARC Animal Rescue Volunteer, Houston, TX 2017
- Polar Bear Plunge for Louisville's Special Olympics 2013
- Volunteered with the Shelby County Humane Society for 7 years; shadowed veterinarian Dr. Gregory and assisted with vaccinations and preparatory procedures for routine surgeries
- Competitive equitation rider for 12 years