Ellie K. Gagliani

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EDUCATION

Ph.D. in Molecular Genetics, Biochemistry, and Microbiology, 2021

University of Cincinnati College of Medicine
Department of Molecular Genetics, Biochemistry, and Microbiology

Bachelor of Science in Biomedical Sciences, 2015

Morehead State University (KY)
Department of Biology and Chemistry
Academic Honors Program

TEACHING

Assistant Professor, Xavier University, Fall 2023 – Present

Department: Chemistry
Courses: Biochemistry I lecture (440), Physiological Chemistry lecture (150), General Chemistry 1 lab (161), Research.

Assistant Professor, Wilmington College, Fall 2021 – Spring 2023

Department: Biology
Courses: Biochemistry I (BI431), Molecular Biology (BI434), Research Experience (BI493), Research Practicum (BI494) Microbiology and Immunology (BI343), Biological Sciences I (BI230), Human Biology (BI203).

Adjunct Instructor, Northern Kentucky University, Spring and Fall 2019

Department of Chemistry and Biochemistry
Course: Physiological Chemistry (115) Lab

Guest Lecturer, UC College of Medicine Graduate School, Spring 2021

Course: Advanced Macromolecular Structure, graduate level
Lecture Topic: *In Vitro* Binding Assays and Cooperativity
Course Director: Professors Tom Thompson, Tom Seegar, and Rhett Kovall, Ph.D.

Guest Lecturer, UC Medical Sciences Baccalaureate Program, Fall 2019 and 2020

Course: Fundamentals of Molecular Genetics
Module: Cancer Genetics
Course Directors: Professors Anil Menon and David Wieczorek, Ph.D.

Guest Lecturer, UC College of Medicine Graduate School, Spring 2020

Course: Mechanisms of Signal Transduction, graduate level
Lecture Topic: NFκB Signaling
Course Director: Professor Bill Miller, Ph.D.

Graduate Student Teaching Assistantship, UC MSBP, Fall 2017, Spring 2020

Course: Biomedical Research Lab Techniques
Course Directors: Professors Stephan Glasser and Eric Gruenstein, Ph.D.

Graduate Student Teaching Assistantship, UC, Spring 2017

Course: Mechanisms of Signal Transduction, graduate level
Course Director: Professor Bill Miller, Ph.D.

Drinking Water Lab Analyst Course, Undergraduate Fellow, 2014 – 2015

Morehead State University
Course Director: Professor Geoff Gearner, Ph.D.

RESEARCH

Visiting Scholar, Summer 2023

University of Cincinnati, Department of Molecular and Cellular Biosciences, Kovall Lab

Research Focus: Purification of the homeobox transcription factor ALX4 and analysis of human disease associated variants effects on protein stability and DNA binding affinity.

Graduate Student Research Fellow, 2015 – 2021

University of Cincinnati, Department of Molecular Genetics
Advisor: Professor Rhett Kovall, Ph.D.

Research Focus: Structural and biophysical characterization of Notch signaling mediated transcriptional activation and repression. Technical focus in protein expression and purification, X-ray crystallography, isothermal titration calorimetry, differential scanning fluorimetry, circular dichroism, analytical ultracentrifugation, and electromobility shift assays. Research projects include:

- Thermodynamic analysis of mutations in Notch pathway proteins associated with Adams-Oliver Syndrome.

- Crystallization of the intracellular domain of Notch 3 with CSL and thermodynamic analysis of the role of phosphorylation of Notch on CSL binding.
- Thermodynamic characterization of the Notch transcription activation complex bound to CREB Binding Protein/P300.
- Crystallization and thermodynamic analysis of the cooperative homeobox transcription factors GSX2/Ind.

Certified Microbiology Drinking Water Lab Analyst, 2014 – 2015

Advisor: Professor Geoff Gearner, Ph.D.
Morehead State University

Research Focus: Testing ambient and drinking water for total coliform and *E. coli* bacteria and reporting data to private and public water systems and the Kentucky Division of Water. Technical focus in bacterial identification and enumeration, membrane filtration, and quality control testing.

PUBLICATIONS

1. Diluvio, G., T. T. Kelley, M. Lahiry, A. Alvarez-Trotta, E. M. Kolb (Gagliani), E. Shersher, L. Astudillo, A. A. Kovall, S. C. Schürer, A. J. Capobianco. *A novel chemical attach on Notch-mediated transcription by targeting the NACK ATPase.* Molecular Therapy Oncolytics. Vol 28. February 17, 2023. https://www.cell.com/molecular-therapy-family/oncolytics/fulltext/S2372-7705(23)00016-5#%20

2. Gagliani, E. K., L. Gutzwiller, Y. Kuang, Y. Odaka, P. Hoffmeister, S. Hauff, A. Turkiewicz, E. Harding-Theobald, P. J. Dolph, T. Borggrefe, F. Ozwald, B. Gebelein, R. Kovall. *A Drosophila Su(H) model of Adams-Oliver Syndrome reveals cofactor titration as a mechanism underlying developmental defects.* PLOS Genetics. Vol 18. August 11, 2022. https://doi.org/10.1371/journal.pgen.1010335

3. Barreyro, L., A. M. Sampson, C. Ishikawa, K. M. Hueneman, K. Choi, M. A. Pujato, S. Chutipongtanate, M. Wyder, W. D. Haffey, E. O'Brien, M. Wunderlich, V. Ramesh, E. M. Kolb (Gagliani), C. Meydan, Y. Neelamraju, L. C. Bolanos, S. Christie, M. A. Smith, M. Niederkorn, T. Muto, S. Kesari, F. E. Garrett-Bakelman, B. Bartholdy, B. Will, M. T. Weirauch, J. C. Mulloy, Z. Gul, S. Medlin, R. A. Kovall, A. M. Melnick, J. P. Perentesis, K. D. Greis, E. Nurmemmedov, W. L. Seibel, D. T. Starczynowski. *Blocking UBE2N abrogates oncogenic immune signaling in acute myeloid leukemia.* Science Translational Medicine. March 9, 2022. Vol 14, issue 635. https://www.science.org/doi/10.1126/scitranslmed.abb7695

4. Kuang, Y., A. Pyo, N. Eafergan, B. Cain, L. M. Gutzwiller, O. Axelrod, Gagliani, E. K., M. T. Weirauch, R. Kopan, R. Kovall, D. Sprinzak, B. Gebelein. *Enhancers with cooperative Notch binding sites are more resistant to regulation by the Hairless co-repressor.* PLOS Genetics. September 24, 2021. Vol 17. https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1009039

5. Landor, Sebastian K. J., Niina M. Santio, William B. Eccleshall, Valeriy M. Paramonov, **Ellen K. Gagliani**, Daniel Hall, Shao-bo Jin, Käthe M. Dahlström, Tiina A. Salminen, Adolfo Rivero-Müller, Urban Lendahl, Rhett A. Kovall, Päivi J. Koskinen and Cecilia Sahlgren. Journal of Biological Chemistry, March 26, 2021. Vol 296. *PIM-mediated phosphorylation of Notch3 promotes CSL-independent tumorigenicity of breast cancer cells through regulation of estrogen receptor alpha signaling.* https://doi.org/10.1016/j.jbc.2021.100593
    - Crystal Structure of CSL bound to Notch3 RAM and DNA: PDBID 6WQU

6. Giaimo. B. D., **Gagliani, E. K.**, Kovall, R. A., Borggrefe, T. *Transcription Factor RBPJ as a Molecular Switch in Regulating the Notch Response.* In: Reichrath J., Reichrath S. (eds) Notch Signaling in Embryology and Cancer. Advances in Experimental Medicine and Biology, vol 1287. Springer, Cham. (2021) https://doi.org/10.1007/978-3-030-55031-8_2

7. Glasser, S. W., Fischesser, D., **Gagliani, E. K.**, Schoch, E. C. & Gruenstein, E. I. *Biomedical Sciences Laboratory Techniques, Classroom and Laboratory Manual: Preparing Students for a Productive First Lab Rotation*. (Van-Griner Learning, 2020).

MANUSCRIPTS IN PREPARATION

1. Webb, J., E. Farrow, Z. Yuan, A. Yarawsky, B. Cain, **E. K. Gagliani**, A. Herr, B. Gebelein, R. Kovall. *Structure of Gsx2-DNA Complex Reveals Protein Interface Involved in Cooperative Binding.*
    - Crystal Structure of Gsx2 bound to DNA: PDBID 8EML

PRESENTATIONS

1. **Gagliani, E. K.**, *"Modeling a rare human genetic disorder using flies, mice, and structural biology."* Dormant Researchers Society. February 23, 2022. Wilmington College. Wilmington, OH.

2. **Gagliani, E. K.**, and R. A. Kovall. *"Modeling Notch Pathway Mutations Underlying Adams-Oliver Syndrome."* MolGen Departmental Seminar Series. March 31, 2020. University of Cincinnati. Cincinnati, OH.

3. **Kolb, E. M.**, L. Gutzwiller, B. Gebelein, and R. A. Kovall. *"A Drosophila model of Adams-Oliver Syndrome reveals co-activator and co-repressor titration as a mechanism underlying developmental defects."* Cincinnati Children's Hospital Notch Meeting. December 13, 2019. University of Cincinnati. Cincinnati, OH.

4. **Kolb, E. M.** and R. A. Kovall. *"Mechanistic and structural basis for CBP/P300 recruitment to the Notch transcription complex."* MolGen Departmental Seminar Series. April 9, 2019. University of Cincinnati. Cincinnati, OH.

5. **Kolb, E. M.** and R. A. Kovall. *"Structural analysis of NACK: a druggable target of Notch signaling."* MolGen Departmental Seminar Series. March 20, 2018. University of Cincinnati. Cincinnati, OH.

6. Kolb, E. M. and R. A. Kovall. *"Structural insight into small molecule inhibitors of Notch transcription complexes."* MolGen Departmental Seminar Series. May 9, 2017. University of Cincinnati. Cincinnati, OH.

ABSTRACTS

1. Gagliani, E. K., L. Gutzwiller, Y. Kuang, B. Gebelein, and R. A. Kovall. *"A Drosophila model of Adams-Oliver syndrome reveals Notch cofactor titration as a mechanism underlying developmental defects."*

   - Graduate Student Research Forum. Scheduled for October 23, 2020. University of Cincinnati College of Medicine. Cincinnati, OH.

   34th Gibbs Conference on Biological Thermodynamics. October 4, 2020.

2. Kolb, E. M., L. Gutzwiller, B. Gebelein, and R. A. Kovall. *"Thermodynamic Analysis of DNA Binding Mutations in the Notch Transcription Factor CSL that are Implicated in Adams-Oliver Syndrome."*

   - Graduate Student Research Forum. November 15, 2019. University of Cincinnati College of Medicine. Cincinnati, OH.

   - 33rd Gibbs Conference on Biological Thermodynamics. October 6, 2019. Carbondale, IL.

3. Kolb, E. M., D. Hall, F. Brändle, J. Salomone, and R. A. Kovall. *"Structural insight into the recruitment of CBP/P300 to the Notch transcription complex."*

   - Graduate Student Research Forum. October 26, 2018. University of Cincinnati College of Medicine. Cincinnati, OH.

   - 32nd Gibbs Conference on Biological Thermodynamics. October 7, 2018. Carbondale, IL.

4. Kolb, E. M. and R. A. Kovall. *"Structural insight into small molecule inhibitors of the Notch transcription complex."*

   - Graduate Student Research Forum. October 5, 2017. University of Cincinnati College of Medicine. Cincinnati, OH.

   - 31st Gibbs Conference on Biological Thermodynamics. September 2017. Carbondale, IL.

   - Purdue Symposium on Integrating Structure, Function, and Interactions of the Biomolecular Universe. May 10, 2017. West Lafayette, IN.

5. Kolb, E. M. and R. A. Kovall. "*Using Isothermal Titration Calorimetry to Characterize DNA Binding of the Notch Signaling Transcription Factor, CSL*."

    - 30th Gibbs Conference on Biological Thermodynamics. August 2016. Carbondale, IL.

AWARDS

Graduate Excellence in Teaching, 2020-21
UC College of Medicine awardee

Honorable Mention at the Graduate Student Research Forum, 2018
UC College of Medicine

First Year Academic Achievement Award, 2017
UC Department of Molecular Genetic, Biochemistry, and Microbiology

Travel Award, Hitchhiker's Guide to the Biomolecular Galaxy Symposium, 2017
Purdue University, Department of Biochemistry

George M. Luckey Jr. Honors Scholarship, 2011-2015
Morehead State University Academic Honors Program
One of 40 students awarded university-wide

ACADEMIC SERVICE

- Instructional Development and Resources Committee, Wilmington College, 2022.
- UC Medical Sciences Faculty Mentoring Program, Undergraduate student mentor for eight freshmen, 2020-21 academic year
- Preparing Future Faculty Graduate Panelist for UC Postdoc Appreciation Week, September 18, 2019
- UC Medical Sciences Baccalaureate Program (MSBP) Committee, 2019 - 2021
- Student President of UC Molecular Genetics Graduate Program, 2018 - 2019
- Judge at 2nd Annual Undergraduate Medical Sciences Poster Fair, UC April 26th, 2019
- Moderator for 31st Gibbs Conference on Biological Thermodynamics, 2017
- Graduate Student Panelist for Women in Science and Engineering (WISE), 2017

- Graduate Student Recruitment Chair of UC Molecular Genetics, 2016 - 2018

PROFESSIONAL DEVELOPMENT

IDRC Workshop Leader: Inclusive Syllabi and Formative Assessments, Wilmington College, March 8, 2023

WID Workshop: Managing Different Disciplinary Expectations, Wilmington College, September 21, 2022.

Pedagogy Mini Festival, Wilmington College, August 5, 2021.

- Inclusive pedagogy through universal design for learning
- What to do about pronouns—and other strategies to support LGBTQ+ students
- Formative assessments & hands-on learning

Preparing Future Faculty Certificate Program, Completed Spring 2020

- 40-hour mentoring experience with Dr. Pamilla Ball at Northern Kentucky University
- Teaching Effectiveness Course (PD8041)
- Academic Job Search Colloquium (PD8042)

Workshop: Planning and Developing a Successful Research Program at a Primarily Undergraduate Institution, Council of Undergraduate Research at Miami University of Ohio, June 28, 2020.