

# 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/oncology/fulltext/S2372-7705\(23\)00016-5#%20](https://www.cell.com/molecular-therapy-family/oncology/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. Borggreffe, 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. Nurmehmedov, 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., Borggreffe, 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](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.
  - 34<sup>th</sup> 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.
  - 33<sup>rd</sup> 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.
  - 32<sup>nd</sup> 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.
  - 31<sup>st</sup> 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.”*

➤ 30<sup>th</sup> 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 2<sup>nd</sup> Annual Undergraduate Medical Sciences Poster Fair, UC April 26<sup>th</sup>, 2019
- Moderator for 31<sup>st</sup> 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.