

# **Korin E. Leffler, MSEH, PhD**

## **Expert Witness: Toxicology and Pharmacology**

**KB4 Consulting, LLC**

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### **EDUCATION**

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#### **PhD in Pharmacology and Toxicology**

Brody School of Medicine, East Carolina University  
Greenville, NC [GPA 4.0]

#### **Master of Science in Environmental Health**

Department of Health and Human Performance, East Carolina University  
Greenville, NC [GPA 4.0]

#### **Bachelor of Science in Biological Sciences with Minor in Genetics**

College of Agriculture and Life Sciences, North Carolina State University  
Raleigh, NC [GPA 3.87] *summa cum laude*

### **PROFESSIONAL EXPERIENCE**

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#### **Director, Medical Information and Scientific Communications, Global Medical Affairs**

Merz North America  
Raleigh, NC  
September 2024-Present

#### **Associate Medical Director, Strategic Research, Global Medical Affairs**

Merz North America  
Raleigh, NC  
September 2022-2024

#### **Clinical Assistant Professor of Pharmacology and Toxicology**

Department of Advanced Nursing Practice and Education, College of Nursing, East Carolina University, Greenville NC  
August 2019-Present

#### **Teaching Assistant Professor of Pharmacology and Toxicology**

Department of Pharmacology and Toxicology, Brody School of Medicine, East Carolina University, Greenville NC  
September 2019-September 2022

**Pharmacology Liaison to the School of Dental Medicine**

School of Dental Medicine, East Carolina University, Greenville, NC  
September 2019-September 2022

**Online Teaching Faculty Mentor and Hyflex Consultant, Office of Faculty Excellence**

Brody School of Medicine Representative, East Carolina University, Greenville, NC  
September 2021-May 2022

**Graduate Research Assistant in Pharmacology and Toxicology**

Department of Pharmacology and Toxicology, Brody School of Medicine, East Carolina University, Greenville, NC  
August 2015-May 2019

**Graduate Research Assistant in Environmental Health**

Department of Health and Human Performance, East Carolina University, Greenville, NC  
August 2006-May 2008

**Research Laboratory Technician in Neurological Disorders**

National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD  
2003

**Research Laboratory Technician and Manager in Developmental Biology**

Developmental Biology Branch, National Health and Environmental Effects Research Laboratory, Office of Research and Development, U. S. Environmental Protection Agency, Research Triangle Park, NC  
2001-2002

**Research Laboratory Intern in Reproductive Biology**

Developmental Biology Branch, National Health and Environmental Effects Research Laboratory, Office of Research and Development, U. S. Environmental Protection Agency, Research Triangle Park, NC  
2000

**PUBLICATIONS AND ABSTRACTS**

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Hardy and Hochman. Global Surgery: How to Work and Teach in Low- and Middle- Income Countries. 2023. Springer Charm. Ed1. Asham EH, **Leffler KE**, Haisch CE. Chapter 18: "How To" teach teamwork and leadership skills effectively from outside the operating room (including virtually)

Parekh RU, White A, **Leffler KE**, Biancardi VC, Eells JB, Abdel-Rahman A and Sriramula S (2021) Hypothalamic Kinin B1 Receptor Mediates Orexin System Hyperactivity in Neurogenic Hypertension. *Scientific Reports*. Vol. 11, no. 1, pp. 21050, <https://doi.org/10.1038/s41598-021-00522-0>.

Fouda, MA, **Leffler KE** and Abdel-Rahman A. "Estrogen-Dependent Hypersensitivity to Diabetes-Evoked Cardiac Autonomic Dysregulation: Role of Hypothalamic Neuroinflammation." *Life Sciences*, vol. 250, 2020, pp. 117598–9., <https://doi.org/10.1016/j.lfs.2020.117598>.

**Leffler KE** and Abdel-Rahman A. "Restoration of Adiponectin-Connexin43 Signaling Mitigates Myocardial Inflammation and Dysfunction in Diabetic Female Rats." *Journal of Cardiovascular Pharmacology*, vol. 75, no. 3, 2020, pp. 259–267., <https://doi.org/10.1097/FJC.0000000000000789>.

**Leffler KE** and Abdel-Rahman A. "Estrogen-Dependent Disruption of Adiponectin-Connexin43 Signaling Underlies Exacerbated Myocardial Dysfunction in Diabetic Female Rats." *The Journal of Pharmacology and Experimental Therapeutics*, vol. 368, no. 2, 2019, pp. 208–217., <https://doi.org/10.1124/jpet.118.254029>.

**Leffler, KE**. "Disrupted Adiponectin-Connexin43 Signaling Underlies Exacerbated Myocardial Dysfunction in Diabetic Female Rats." *ProQuest Dissertations Publishing*, 2019, <https://go.exlibris.link/phXQ7mpy>.

**Leffler KE** and Abdel-Rahman A. "Disrupted Adiponectin-Connexin43 Signaling Underlies the Exacerbated Myocardial Dysfunction in Diabetic Female Rats." *The FASEB Journal*, vol. 32, no. S1, 2018, pp. 838.11–838.11., [https://doi.org/10.1096/fasebj.2018.32.1\\_supplement.838.11](https://doi.org/10.1096/fasebj.2018.32.1_supplement.838.11).

**Leffler KE** and Abdel-Rahman A. "Abstract 15846: Connexin43, but Not Caveolin-3 Underlies Estrogen Exacerbation of Diabetic Female Myocardial Dysfunction." *Circulation (New York, N.Y.)*, vol. 138, no. Suppl\_1 Suppl 1, 2018, pp. A15846–A15846., <https://go.exlibris.link/P5YXT8zD>.

Anderson A and **Leffler KE**. "Bedbug Infestations in the News: A Picture of an Emerging Public Health Problem in the United States." *Journal of Environmental Health*, vol. 70, no. 9, 2008, pp. 24–28., <https://go.exlibris.link/v1pBMSIC>.

Abbott BD, Buckalew AR and **Leffler KE**. "Effects of Epidermal Growth Factor (EGF), Transforming Growth Factor- $\alpha$  (TGF $\alpha$ ), and 2,3,7,8-Tetrachlorodibenzo-p-Dioxin on Fusion Of Embryonic Palates in Serum-Free Organ Culture Using Wild-Type, EGF Knockout, and TGF $\alpha$  Knockout Mouse Strains." *Birth Defects Research Part A: Clinical and Molecular Teratology*, vol. 66;73; no. 6, 2005, pp. 447–454., <https://doi.org/10.1002/bdra.20133>

## **PRESENTATIONS AND PUBLIC SPEAKING EVENTS**

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**ADHD and ASD Pharmacology**—Invited speaker for Department of Advanced Nursing Practice and Education, Psychiatric Mental Health Nurse Practitioner Program Fall Intensives (Greenville, NC, August 2024; *expected*)

**Stimulants and the Brain: What Attorneys Need to Know**—Invited speaker for Indigent Defense Services 2024 Forensic Sciences Educational Series (virtual, May 2023)

**Drug Classes and their Effect on the Human Body**—Invited speaker for North Carolina Office of Indigent Defense CLE course (Raleigh, NC, Jan 2023)

**Methamphetamine Psychosis and Pharmacology**—Invited speaker for Bridging the Gap VI—Mitigation Conference. Capital Defender’s Office (Carolina Beach, NC, November 2023)

**(CLE) Drug Analysis: Basics of the Process**—Invited Co-speaker for the Carrabus County local Bar association; defense and prosecuting attorneys (Concord, NC, April 2023)

**Updates in Psychopharmacotherapeutics** – Invited Speaker for Department of Advanced Nursing Practice and Education, Psychiatric Mental Health Nurse Practitioner Program Fall Intensives (Greenville, NC, September 2022)

**Complementary Medicine and Traditional Pharmacotherapeutics for Mental Health**  
Invited Speaker for Department of Advanced Nursing Practice and Education, Psychiatric Mental Health Nurse Practitioner Program Fall Intensives (Greenville, NC, September 2022)

**Drug Analysis: Basics of the Process** – Invited speaker and co-presenter for the 2022 Summer NC County/DSS Attorney’s Conference, NCACC, (Wrightsville Beach, NC, August 2022)

**Drug Testing and Analysis Basics** - Invited speaker and co-presenter for the 2022 Parent Attorney and Juvenile Defender Conferences, University of North Carolina at Chapel Hill, School of Government (Chapel Hill, NC, August 2022)

**Department of Pharmacology and Toxicology Graduate Program Retreat Committee**  
Presenter and Organizer (Greenville, NC, June 2022)

**Updates and Advances in Prescribing Psychopharmacotherapeutics** – Invited Speaker for Adult Mental Health Conference; Advancing Knowledge and Skills, Eastern Area Health Education Center (Greenville, NC, April 2022)

**Brody School of Medicine Faculty Teaching Workshop Administrator and Presenter**

East Carolina University (Greenville, NC, March 2022)

**Hyflex Instruction at East Carolina University: 6 Series Workshop Co-Director and Presenter** (virtual; Greenville, NC February-April 2022)

**Faculty Spotlight Award, Office of Faculty Affairs and Leadership Development**  
East Carolina University (Greenville, NC, February 2022)

**Attention Deficit and Hyperactivity Disorder Pharmacological Therapeutics Presentation** Department of Advanced Nursing Practice and Education, Psychiatric Mental Health Nurse Practitioner Program Fall Intensives (Greenville, NC, September 2021)

**Department of Pharmacology and Toxicology Faculty Retreat Administrator, Organizer and Presenter** East Carolina University (Greenville, NC, June 2021)

**AHA Scientific Sessions (Women's Health and Sex Differences) -- Poster Abstract**  
15846: *Connexin43, but Not Caveolin-3 Underlies Estrogen Exacerbation of Diabetic Female Myocardial Dysfunction* (Chicago, IL, Nov. 2018)

**Finalist for 3 Minute Thesis -- Diabetes: Sugar that Sours Womens' Hearts** East Carolina University (October 2018)

**Experimental Biology – ASPET Oral Presentation** for Abstract 1722: *Disrupted Adiponectin- Connexin43 Signaling Underlies the Exacerbated Myocardial Dysfunction in Diabetic Female Rats; Cardiovascular Consequences of Metabolic Targeting in Obesity Session* (#3720) (San Diego, CA, Apr 2018)

**Third Place Graduate Student Poster Award** -- Experimental Biology ASPET; Division of Cardiovascular Pharmacology (San Diego, CA, Apr 2018)

## **PROFESSIONAL ORGANIZATIONS**

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Drug Information Association Member (2024-present)

Society of Toxicology (SOT) Associate Member (2022-present)

Medical Affairs Professional Society Member (2022-present)

American Society of Clinical Psychopharmacology (2022-present)

International Association of Medical Science Educators Member (2020-present)

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American Society for Pharmacology and Experimental Therapeutics (ASPET) Member;  
Division of Cardiovascular Pharmacology (2016-present)  
Executive Member (2018-2020)  
Division of Neuropharmacology (2019-present)  
Division of Pharmacology Education (2019-present)  
Division of Toxicology (2020-present)

American Society for Women in Science Member (2019-present)

American Heart Association Professional Member (2017-present)

## **PROFESSIONAL APPOINTMENTS AND ACTIVITIES**

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Board Certified Medical Affairs Specialist (BCMAS) (2022)

Department of Pharmacology and Toxicology Core Curriculum Redesign Committee (June 2022-September 2022)

Department of Pharmacology and Toxicology Electives Curriculum Redesign Committee (June 2022-September 2022)

Chair of Department of Pharmacology and Toxicology Interactions Committee (June 2022-September 2022)

Faculty Advisor on Master's Thesis Committee (Drew Theobald; 2022)

Military Affiliate Faculty Mentor for Student Veteran Services at East Carolina University (Fall 2021-September 2022)

Essential Skills in Medical Education Course (ESME) Certification at IAMSE 2022 (Denver, CO June 2022)

International Association of Medical Science Educators (IAMSE) Annual Meeting 2022 (Denver, CO June 2022)

College of Nursing, Pharmacology and Physiology Faculty Recruitment Committee, East Carolina University (June-August 2022)

"How Bias Impacts Belonging" session at East Carolina University (June 2022)

Duke University Master's of Biomedical Sciences Early Assurance to Brody Medical School Reviewer (April 2022)

Faculty Senator, Brody School of Medicine Representative, East Carolina University (May

2022- September 2022)

Travel Award Reviewer, American Society of Pharmacology and Experimental Therapeutics, Experimental Biology Meeting 2022

Health Systems Sciences Committee, Brody School of Medicine, East Carolina University (May 2022-September 2022)

Office of Diversity and Inclusion, Faculty Affairs and Leadership Development Book Studies: *Caste: The Origins of our Discontents*, by Isabel Wilkerson (Spring 2022), *Small Teaching Online*, by Flower Darby (Fall 2021), *The Privileged Poor*, by Anthony Abraham Jack (Fall 2020)

The Faculty Success Program Completion, National Center for Faculty Development and Diversity (Fall 2021)

Pharmacology and Toxicology Department Resources Committee; Assistant Professor Rank Representative Brody School of Medicine (2022-September 2022)

Faculty Tenure-Tract Recruitment Committee, Department of Pharmacology and Toxicology, Brody School of Medicine (February 2022-September 2022)

Ethical Standards and Professionalism Workgroup for Medical Students, Brody School of Medicine (February 2022-September 2022)

Brody School of Medicine Early Assurance Interviewer; Selection Committee (February 2022)

Academic Strive: Online Publishing. Associate Editor (2021-2022)

Executive Curriculum Committee Basic Sciences Representative, Brody School of Medicine, (July 2021-September 2022)

Medicine and Therapeutics Subcommittee, School of Dental Medicine, ECU (July 2021-September 2022)

Brody School of Medicine Admissions Interviews Committee Interviewer and Reviewer (August 2021-September 2022)

Faculty Mentor for Online Instruction, East Carolina University; 4 mentees (2021-2022)

Curricular Redesign Committee, School of Dental Medicine, East Carolina University (2020)

Faculty Advisor on Doctoral Thesis Committee (Mary Katherine Donovan; 2020-2022)

Graduate Studies Committee, Department of Pharmacology and Toxicology (2019-2022)

Invited Speaker for the College of Nursing, Psychiatric Mental Health Nurse Practitioner Fall Intensives, topic: Attention Deficit and Hyperactivity Disorder Pharmacotherapeutics (2021)

Research Instructor in the Department of Pharmacology and Toxicology Hiring Committee (Fall of 2020)

Reviewer for Early Career Awards at Experimental Biology for the Cardiovascular Pharmacology Division of American Society for Pharmacology and Experimental Therapeutics (2019-2020)

Reviewer of poster abstracts for Travel Awards to Undergraduate and Graduate Students at Experimental Biology for the Cardiovascular Pharmacology Division of American Society for Pharmacology and Experimental Therapeutics (2019-2020; 2022)

Guest presenter for STEM outreach in Middle Schools (2019-2020)

Admissions Reviewer for Summer Biomedical Research Program, Brody School of Medicine, East Carolina University (2019; 2022)

Brody Graduate Women Faculty Committee (2019-2022)  
Executive and Leadership Board, Program Chair (2021-2022)  
Secretary (2022)

Brody School of Medicine Graduate Association (member: 2015-2019)  
Philanthropy Committee Chair (2017-2018)

## **TEACHING EXPERIENCE**

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### **Neurobiology and Psychopharmacology for Advanced Nursing Practice (NURS 7501)**

Fall Graduate Nursing Psychiatric Mental Health Nurse Practitioner Program

Introduction to Neuroscience, chemical basis of neurotransmitters, transporters, receptors, enzymes and ion channels as drug targets

Benefit-risk assessment of drug decisions, pharmacological drug actions

General principals of psychopharmacology: prescribing medications

    Pharmacokinetics/toxicokinetics

    Pharmacodynamics/toxicodynamics

    Prescribing and individualizing treatments; monitoring treatments

Psychosis, schizophrenia spectrum other psychotic disorders, neurodevelopmental, disruptive, impulse-control and conduct disorders

Common standardized rating scales for diagnosis and management of psychiatric mental health disorders



Evaluate evidence-based practices for selection of psychopharmacologic treatment necessary for stabilizing symptoms and preventing relapse given specific clinical presentations

Outline the mechanisms of action, pharmacokinetic, pharmacodynamic, and pharmacogenetic properties, adverse events, drug interactions, warnings, precautions for the major medications used for treatment of psychiatric mental health disorders

Evaluate psychological, neurobiological, physiological, and behavioral responses to psychoactive medications in culturally and socioeconomically diverse client groups across the lifespan

Synthesize new discoveries in neuroscience and psychopharmacology in caring for persons with complex psychiatric disorders across the lifespan

Identify essential information to discuss during patient education about medication treatment and provide resources to clients to improve treatment adherence

Evaluate legal, ethical, cultural, and professional standards in prescribing psychotropic medications across the lifespan

Bipolar and mood disorders

Personality disorders

Eating Disorders

Depressive Disorders, Anxiety and Anxiety-related disorders

Neurocognitive Disorders

Neurotransmitters, circuits, neuroimaging, genetics, etiology, risk factors, pathophysiology, signs and symptoms, diagnostic criteria and treatment of

Pain management

Sleep-wake Disorders

Substance-related disorders, Substance-Use Disorders

Neurotransmitters, circuits, neuroimaging, genetics, etiology, risk factors, pathophysiology, signs and symptoms, diagnostic criteria and treatment of

**Biomedical Sciences Special Topics (BMSC 6141), Graduate Physiology for Pharmacology and Toxicology**, Course director and lecturer for vasculature physiology, respiratory physiology, cardio I and II physiology

**Faculty Development Workshops, Brody School of Medicine**, improvement of medical education with faculty development at both the departmental and Medical school wide level. These workshops are presented annually

**Online Teaching Mentor and Hyflex Instructional Consultant**, Office for Faculty Excellence, East Carolina University, private mentor for grant awardee and online forums University-wide and at the Brody School of Medicine

**Foundations of Biological Sciences I (SODM 8110, 8210, 8310)**, D1 curriculum, School of Dental Medicine, liaison for the department and lectures

Foundational Principles

Pharmacodynamics and Pharmacokinetics

Toxicodynamics and Toxicokinetics

Pharmacology for Special Patient Populations

Drug-Drug Interactions  
Antiviral and Antiretrovirals  
Applied Dental Pharmacotherapeutics  
Antihistamines and Antirheumatics  
Anti-inflammatories  
Centrally Acting Analgesics (Opioids)  
Central Nervous System Stimulants  
Drugs for Chronic Orofacial Pain  
Drugs for Movement Disorders and Spasticity  
Pharmacologic treatment of Neurodegenerative Disorders  
Antidepressants and Drugs for Mood Disorders  
Antiepileptic Drugs  
Antiarrhythmic Therapeutics  
Antihypertensive Therapeutics  
Disorders of Calcium, Bone and Joint Pharmacology  
Clinical Medicine of Pregnancy

**Foundations of Disease and Therapeutics (FDND 8000)**, Block 3, BSOM M1 curriculum,  
Antiviral and Antiretroviral Therapeutics  
Nonsteroidal anti-inflammatory (NSAID) drugs

**Organ Systems Courses (SYST9100-9600)**, Block 4, BSOM M2 curriculum  
Antiarrhythmic Drugs  
Pulmonary Pharmacology  
Central Nervous System Stimulants  
Attention Deficit and Hyperactivity Disorder (ADHD) Therapeutics  
Local Anesthetics

**Medical Pharmacology for Health Sciences I and II (PHAR 7601, 7602)**, Fall/Spring  
Graduate Program, Course Director and lectures are same from FND 8000 and SYST9100-  
9600

**Advanced Pharmacology for Nurse Anesthesia (NURS 8805, 8806)**, Spring/Fall CRNA  
Program, lectures are same from FND 8000 and SYST9100-9600

**Clinical Pharmacology for Advanced Nursing Practice (NURS 6611)**, Fall/Spring  
Graduate Nursing Program, Course Director, online delivery of all lectures across all topics.  
Teaching 3 sections each semester

**Pharmacotherapeutics in Nursing (NURS 3380)**, Fall/Spring Undergraduate Nursing  
Program, developed online recorded lectures in response to the COVID pandemic,  
substitute lecturer as needed

**Introduction to Pharmacology (PHAR 7609)**, Fall Graduate Program, lectures include  
serotonin receptors and anti-inflammatories

**Foundations of Biomedical Sciences I and II (BMSC 7002, 7003)**, Fall/Spring Graduate Program, lectures included antihypertensives, cardiac glycosides and pharmacology foundations

**Principles of Physiology for Pharmacology (BMSC 6141)** Fall 2022 Graduate Program, Course director. Organ systems physiology necessary for graduate pharmacology and toxicology

**Practical Problems in Biometry (PHAR 7777)**, Spring Graduate Program, Course co-director and delivered lectures on the ANOVA unit

**Principles of General Toxicology (PHAR 7680)**, Fall Graduate Program, invited lecturer on Effects of Air Pollution

**Introduction to Pharmacology (PAPD 6500)**, Fall/Spring Physician Assistant Program, lectures included Antihypertensive Therapeutics

Remediation for M2 students in the Pharmacology Thread of Organ Systems

Undergraduate Mentor for East Carolina Undergraduate in laboratory

Peer Tutor – Peer tutor for graduate physiology and medical pharmacology course

Summer Biomedical Research Program Graduate Assistant – Assisted and mentored undergraduate students in the development and execution of a research project

Instructor for Undergraduate Environmental Health Laboratory, East Carolina University

Instructor for Undergraduate Ecology Laboratory, North Carolina State University