



Department of Experimental and Clinical Pharmacology

2023 Annual Report

Department of Experimental and Clinical Pharmacology
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ABOUT

ECP MISSION

The mission of the Department of Experimental and Clinical Pharmacology (ECP) is to discover, disseminate, and apply new knowledge related to safe, effective, and economical medication use in patients. ECP will educate students of pharmacy, post-graduate trainees, and others for careers in pharmacy and health care with the ultimate goal of improving health. The ECP faculty and staff actively engage in teaching and conduct research pertaining to experimental and clinical pharmacology and patient outcomes to identify and promote the use of the best therapies. Together, ECP strives to advance the science of human pharmacology and therapeutics, while maintaining the highest standards of ethics in research and education.

DATA COLLECTION

Note that financial data is reported by fiscal year (2023: July 2022-June 2023). All other data uses the calendar year. These parameters continue to be the standard since 2019.

UNIVERSITY OF MINNESOTA MISSION

The University of Minnesota, founded in the belief that all people are enriched by understanding, is dedicated to the advancement of learning and the search for truth; to the sharing of this knowledge through education for a diverse community; and to the application of this knowledge to benefit the people of the state, the nation and the world. The University's threefold mission of research and discovery, teaching and learning, and outreach and public service is carried out on multiple campuses and throughout the state.

EQUAL OPPORTUNITY STATEMENT

The University of Minnesota shall provide equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression.

Inquiries regarding compliance may be directed to the Director, Office of Equal Opportunity and Affirmative Action, University of Minnesota, 274 McNamara Alumni Center, 200 Oak Street S.E., Minneapolis, MN 55455, (612) 624-9547, eoaa@umn.edu. Website: eot.umn.edu/home

This publication/material is available in alternative formats upon request. Please contact Zack McGough, Experimental and Clinical Pharmacology, 612-626-4677.

DISABILITY ACCESS STATEMENT

This publication/material is available in alternative formats upon request. Direct requests to Zack McGough, Experimental and Clinical Pharmacology, 612-626-4677.

LETTER FROM THE DEPARTMENT HEAD

Dear Colleagues and Friends,

In this 2023 annual report, I once again take pride in highlighting the numerous achievements by members of our Department of Experimental and Clinical Pharmacology (ECP).

Our ECP department continues to achieve significant accomplishments while demonstrating our collective commitment to the research, education, and service missions of our College. We continue to adapt our respective expertise to the ever-changing environment, student body and novel research approaches that emerge, while tackling some of the key questions and challenges facing our profession and healthcare needs of society. These are indeed significant tasks which we take on while maintaining our focus on conducting quality research, innovative educational models, and service to our profession and the broader community. This can only be done with respect for the importance of self-care for all members of our community. As always, our key strengths remain the quality of our faculty, students and staff and leveraging our collaborations with others to achieve our collective successes.

The efforts and commitments made by ECP faculty, staff, and students over the 2023 calendar year are reflected by our strong performance research metrics:

- sponsored award expenses remained consistent from 2022 numbers at ~\$4 million in 2023
- a consistent 23% faculty salary offset in 2023
- 73 peer-reviewed articles were published by ECP faculty in 2023
- a further increase in new grants received in 2023 to 60 (up from 46 in 2022)

These key indicators of progress, along with our strong record of contributions to the teaching and service missions of our college, reflect well on the exceptional dedication of our faculty, staff, and students. Even in the setting of various forms of economic and demographic challenges confronting higher education, geopolitical affairs, and even stresses on our environment, ECP's faculty, staff and students remain focused on our mission and are proud of our accomplishments. ECP's contributions to the College's re-imagining of our new professional program continues as we embark on year two of the new MNSpire curriculum. We are also proud of our successful Collegiate accreditation visit which took place this past Fall 2023. It is important for all of us to take stock in the outstanding record of achievements our students, staff, and faculty have realized. These things are not achieved without strong leadership at the department level and throughout the College.

Since our 2022 report, the personnel changes we have realized include the retirement of ECP's Dr. Susan Marino. We wish her the very best and thank her for their service and dedication to the department and college over her years of tenure. Looking forward, 2023 marked the successful completion of our search for a new tenure track faculty position in pharmacometrics, which I can proudly announce resulted in the hire of Dr. Shen Cheng- a former Ph.D. graduate from our own program. We are very excited about our new hires and look forward to reporting on their progress and contributions in next year's annual report. ECP continues to look ahead to meet new challenges and create opportunities as they arise. Personally, I have great confidence that our department will continue to excel and I take great personal pride in sharing this report as testimony to what our faculty, students, and staff have accomplished to advance the science of our discipline and support a new generation of students from our ECP graduate program.

Finally, I wish to acknowledge and thank all alumni, donors, and friends of the department for their continued support, engagement, and ongoing pride for the things we do for our global community.

With warm regards,



Robert J. Straka
Department Head

NEW FACULTY & PROMOTIONS



Reena Kartha, MS, PhD, was promoted to Associate Professor in May 2023. Her expertise in translational research exploring the roles of therapeutic agents which modulate oxidative stress and inflammation represents important work to advance therapies to treat select rare diseases. Her scholarly achievements include over 35 refereed research publications, many as senior or corresponding author in high-impact journals, and recipient of national grants from NIH and other sources that fuel new discoveries in her field. Dr. Kartha's teaching contributions are significant at each of the undergraduate, professional, and graduate levels of instruction--noting her recognition as an "outstanding junior mentor award from the CTSI in 2017" and offering of a "Grand Challenge Honors Course on Rare Diseases" in particular. Her recognition on a national and international basis continues to grow as is evident

from her invited speaking engagements as well as her service commitments to the field of rare diseases and her leadership in advancing diversity, equity and inclusion initiatives at the College of Pharmacy and beyond.

DEPARTMENT MEMBERS

FACULTY

Angela K. Birnbaum, PhD, FAES
Professor; Director of Graduate Studies

Jeffrey Bishop, PharmD, MS, BCPP, FCCP
Associate Professor

Scott A. Chapman, PharmD
Professor

James C. Cloyd, PharmD, FCCP
Professor, Weaver Endowed Chair in
Orphan Drug Development

Lisa Coles, PhD
Research Assistant Professor

Jeannine M. Conway, PharmD, BCPS
Associate Professor; Associate Dean
for Professional Education (Until November, 2023);
MNSpire Block Lead (As of January, 2023)

Elizabeth Hirsch, PharmD, BCPS
Associate Professor

R. Stephanie Huang, PhD
Professor

Pamala A. Jacobson, PharmD, FCCP
Distinguished Professor; Associate Department Head

L'Aurette A. Johnson, PhD
Assistant Professor; Associate Director of Graduate
Studies (Until June 30, 2023) ; Director of Diversity

Reena Kartha, PhD
Research Associate Professor

Michael Kotlyar, PharmD
Associate Professor

Ilo E. Leppik, MD
Professor

Ling Li, PhD, DVM
Professor, VFW Endowed Chair in
Pharmacotherapy for the Elderly; Associate Department
Head

Susan E. Marino, PhD (Retired February, 2024)
Associate Professor

Melanie R. Nicol, PharmD, PhD
Associate Professor; Associate Director of Graduate
Studies (As of July 1, 2023)

Leo J. Sioris, PharmD
Professor

Robert J. Straka, PharmD, FCCP
Professor; Department Head

Lynda Welage, PharmD, FCCP
Professor; Dean

Beshay Zordoky, PhD
Associate Professor

ADJUNCT FACULTY

Mahmoud Al-Kofahi, DDS, PhD
Assistant Professor

Josiah Allen, PharmD
Assistant Professor

Kyle Baron, PharmD, PhD
Assistant Professor

Alexander Berg, PharmD, PhD, FCP
Associate Professor

Ashley Brown, PharmD
Assistant Professor

Samuel Callisto, PhD
Assistant Professor

Jason Chittenden, PhD

Assistant Professor

Casey Dorr, PhD

Assistant Professor

David Gregornik, PharmD

Associate Professor

John Gualtieri, PharmD

Assistant Professor

Serge Guzy, PhD

Professor

Silvia M Illamola, PharmD, PhD

Assistant Professor

Mutaz Jaber, PhD

Assistant Professor

John Jancik, PharmD, BCCCP

Associate Professor

Jeanine Jarnes, PharmD

Assistant Professor

Nitin Kaila, PhD

Assistant Professor

Daniel E. Keyler, PharmD

Professor

Richard Kingston, PharmD

Assistant Professor

Frank N. Konstantinides, MT, MS

Professor

George Konstantinides, PharmD

Assistant Professor

Edris Kosar, PharmD

Assistant Professor

Robert Kriel, MD

Research Professor

Smita Kshirsagar, PhD

Assistant Professor

Marie D. Kuker, RPh

Assistant Professor

Richard L. Lalonde, PharmD, FAAPS, FCP, FCCP

Professor

Stephen H. LeMaster, PharmD

Associate Professor

Ramaiah Muthyala, PhD

Associate Professor

David Parra, PharmD

Associate Professor

Pamela A. Pawloski, PharmD

Assistant Professor

Cristina Peterson, PhD

Assistant Professor

Mark Robbins, PhD, JD

Associate Professor

Samuel Roiko, PhD

Assistant Professor

Ahmed H. Salem, PhD

Professor

Kyriakie Sarafoglou, MD

Professor

Robert J. Schumacher, PhD

Assistant Professor

Catherine Sherwin

Associate Professor

Kelly M. Sioris, PharmD

Assistant Professor

Catherine St. Hill, DVM, PhD

Associate Professor

John V. St. Peter, PharmD

Associate Professor

Sean Stewart, PharmD, BCACP, CLS

Associate professor

Takuto Takahashi, MD, PhD

Assistant Professor

Mary A. Ullman, PharmD

Associate Professor

Brian Van Ness, PhD

Professor

Orly Vardeny, PharmD, BCPS, FHFSA

Associate Professor

Ya-Feng (Jay) Wen, PhD

Assistant Professor

STAFF

Sandra Bowers

Researcher, Birnbaum Research Program

Lindsey Brewers Collins, MS

Junior Scientist, Nicol Research Program

Sheena Dufresne

Study Coordinator, Kotlyar Research Program

Lori Endsley

MTRF Administrator

James Fisher

Technical Director, CPAS Laboratory

Katherine Goffin (Until August, 2023)

Administrative Specialist, ECP Office

Marianne Grant

Lab Manager, Zordoky Research Program

Silvia M. Illamola, PharmD, PhD

Research Associate, Birnbaum Research Program

Alyssa Johnson

Research Professional, Jacobson Research Program

Minwoo Kim

Researcher, Li Research Program

Adam M. Lee, PhD

Research Associate, Bishop Research Program

Zack McGough, MEd

Department Administrator, ECP Office

Usha Mishra, MS

Assistant Scientist, Center for Orphan Drug Research

Becky Palapala

Finance & Communications Specialist, ECP Office

Marcia Terluk, PhD

Researcher, Center for Orphan Drug Research

Josslen Thieschafer

Researcher, Li Research Program

Susan Williford, MEd

Graduate Program Coordinator, ECP Office

POSTDOCS, FELLOWS, & VISITING SCHOLARS

Israa Gamal Aly Abdelbar

Advisor: R. Stephanie Huang, PhD

Mahmoud ElSherif

Advisor: Beshay Zordoky, PhD

Benu George, PhD

Advisor: Beshay Zordoky, PhD

Mina George

Advisor: Beshay Zordoky, PhD

Vasudeva Reddy Dodda, PhD

Advisor: Ramaiah Muthyala, PhD

Mohamed Fayed, BPharm

Advisor: Lisa Coles, PhD

Robert Gruener, PhD

Advisor: R. Stephanie Huang, PhD

Jaehyeok Roh, PharmD

Advisor: Reena Kartha, PhD

Sampreeti Jena, PhD

Advisor: R. Stephanie Huang, PhD

Holly Korthas, PhD

Advisor: Ling Li, PhD

Bushra Sadaf, PhD

Advisor: Beshay Zordoky, PhD

Omar Al Yacoub, PharmD, MSc, PhD

Advisor: Lisa Coles, PhD

NEW & CONTINUING GRADUATE STUDENTS

PhD PROGRAM

Ibrahim Abdelgawad, BS

Advisor: Beshay Zordoky, PhD; Ling Li, DVM, PhD

Charul Avachat, MS

Advisor: Angela Birnbaum, PhD

Kuber Bajgain, MS

Advisor: Ling Li, DVM, PhD

Adeboye Bamgboye, BPharm

Advisor: Lisa Coles, PhD

Cecilia (Cece) Barajas, BS

Advisor: Carolyn Fairbanks, PhD

Jessica Barry, BS

Advisor: Angela Birnbaum, PhD

Morgan Bixby, BS

Advisor: Elizabeth Hirsch, PharmD, RPh; Pamala Jacobson, PharmD

Tiffany Chang, MS

Advisor: Elizabeth Hirsch, PharmD; Melanie Nicol, PharmD, PhD

Mohamed Dabour, MS

Advisor: Beshay Zordoky, PhD

Mary Raphel Daniel, PharmD

Advisor: Beshay Zordoky, PhD

Yingbo Huang, MS

Advisor: R. Stephanie Huang, PhD

Alyssa Lantz, BS

Advisor: Melanie Nicol, PharmD, PhD

Chenxu Li, MS

Advisor: Reena Kartha, PhD; Lisa Coles, PhD

Yuhan Long, BS

Advisor: Angela Birnbaum, PhD

Xintian Lyu, BS

Advisor: Angela Birnbaum, PhD

Moataz Mohamed, MS

Advisor: Pamala Jacobson, PharmD

Nathan Phan, BS

Advisor: Reena Kartha, PhD and James Cloyd, PharmD

Abdelrahman Saqr, MS

Advisor: Pamala Jacobson, PharmD

Yuting Shan, PharmD

Advisor: R. Stephanie Huang, PhD

Jason Sriwijaya, MD

Advisor: Angela Birnbaum, PhD

Mei-Chi (Judy) Su, MS

Advisor: R. Stephanie Huang, PhD; Angela Birnbaum, PhD

Boguang Sun, PharmD

Advisor: Robert J. Straka, PharmD

Bovornpat Suriyapakorn, PharmD

Advisor: Lisa Coles, PhD

Fan Wang, MS

Advisor: Melanie Nicol, PharmD, PhD; Angela Birnbaum, PhD

Lusi Zhang, MHI, PharmD

Advisor: Jeff Bishop, PharmD, MS

Rui Zhong, BS

Advisor: Ling Li, DVM, PhD

MASTERS PROGRAM

Mohamed Duklef, BPharm

Advisor: Reena Kartha, PhD

Jennifer Vigliaturo, BA, BS

Advisor: Angela Birnbaum, PhD

RESEARCH

Led by our world-class faculty, research teams conduct groundbreaking and critical research in the Department of Experimental and Clinical Pharmacology. Faculty research programs focus on oncology, transplantation, infectious diseases, pharmacogenomics, geriatrics, critical care, neuroscience, cardiovascular diseases, pediatrics, and psychiatry, among other areas. ECP is home to the Lawrence C. Weaver Endowed Chair in Orphan Drug Development and the VFW Endowed Chair in Pharmacotherapy for the Elderly. In addition, ECP's state-of-the-art, CLIA-certified Clinical Pharmacology Analytical Services Laboratory has provided an important research resource to both University researchers and external customers for 20 years, as of the fall of 2023.

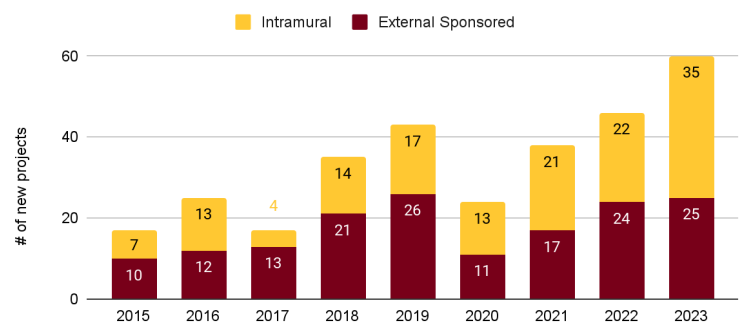
Our faculty routinely present important research at national and international conferences, lecture and collaborate across the country, serve as reviewers and editorial board members of international journals, hold leadership positions in national organizations, and serve on review committees for National Institutes of Health (NIH) and other granting agencies.

ANNUAL PERFORMANCE AND YEAR-TO-YEAR TRENDS

- Funding for research in ECP comes from both intramural and external sources:
 - New Grants Received: 60
 - Intramural: 35
 - External sponsored: 25
- Research endeavors result in various outputs, including:
 - Articles in peer-reviewed publications: 73
 - Books, chapters and other publications: 8

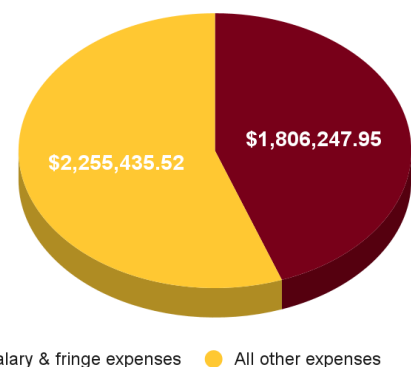
New Projects by Type

2015-2022



Percent of Expenditures by Category

\$4,061,683

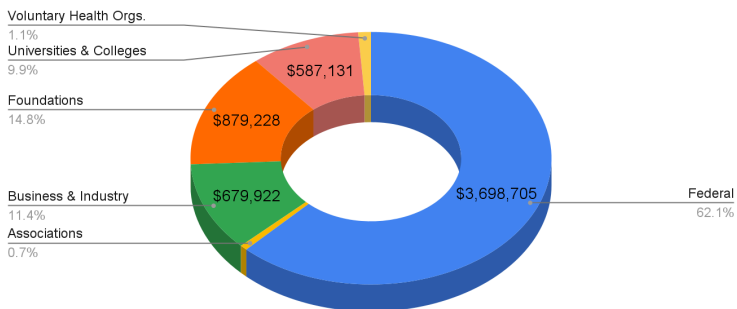


Financials of Sponsored Projects in FY2023

- Expenditures by category
 - Salary and Fringe \$1,806,248
 - Other Expenses \$2,255,436
 - Total \$4,061,683
- Percentage of department faculty salaries supported by sponsored projects: 23.15%
 - Salary offset percentage grew to 23% for the year
 - (22% in FY21, 22% in FY22).

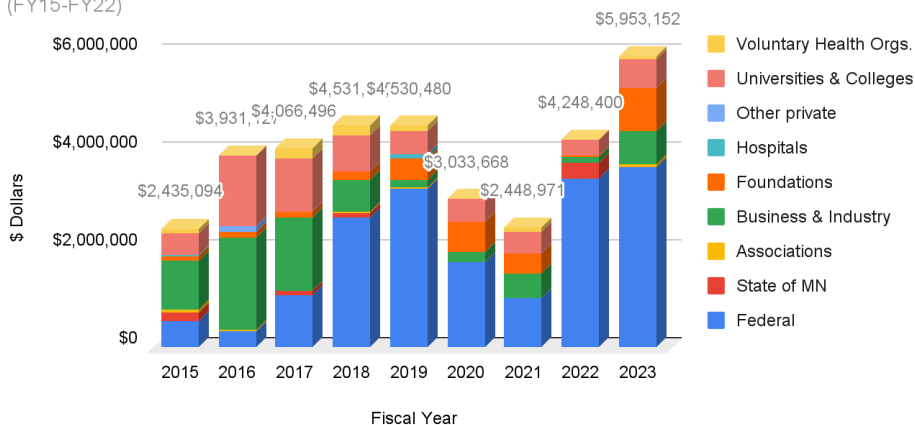
Sponsored Awards by Source (FY23)

Total: \$5,953,152



Sponsored Awards by Source

(FY15-FY22)



A RESEARCH-RICH ENVIRONMENT

The College of Pharmacy is ranked 3rd among outstanding pharmacy education and research institutions in the world. It is located within one of the largest academic health centers in the U.S., with nationally recognized programs in public health, medicine, nursing, dentistry, and veterinary medicine. Major campus research facilities include a Clinical and Translational Science Institute, the Biomedical Genomics Center, and a comprehensive cancer center. In addition, there are numerous partnerships with affiliated healthcare systems that offer exceptional research and educational programs. The Twin Cities also have a large number of cutting-edge biomedical companies eager to collaborate with the academic community.

RESEARCH CENTERS WITHIN ECP

- Center for Orphan Drug Research (Dr. James Cloyd, Director)
- Institute for Personalized Medicine (Dr. Pamala Jacobson, Director)
- Center for Clinical and Cognitive Neuropharmacology (Dr. Susan Marino, Director)

LOCATIONS AND FACILITIES

ECP maintains a total of 25,889 square feet of office and laboratory space within four buildings on the East Bank of the University of Minnesota’s Twin Cities campus:

- Weaver-Densford Hall 7,332 SF
- McGuire Translational Research Facility 7,696 SF
- Phillips Wangensteen Building 6,915 SF
- 717 Delaware Street SE 3,946 SF

NEW EXTERNALLY FUNDED PROJECTS WITH ECP FACULTY

Faculty	Project Description	Sponsor
Jeffrey Bishop (Advisor)	Developmental Psychopathology T32	NIH National Institute of Mental Health
Jeffrey Bishop (Co-I)	An Informatics Framework for Discovery and Ascertainment of Drug-Supplement Interactions	NIH National Center for Complementary and Integrative Health
Jeffrey Bishop (Advisor)	Comorbidity: Substance Use Disorders and Other Psychiatric Conditions	NIH National Institute on Drug Abuse
Jeffrey Bishop (Advisor)	Real-world utilization and impact of psychiatric pharmacogenomic testing in a large health system	American Association of Psychiatric Pharmacists
Elizabeth Hirsch (Co-PI), Melanie Nicol (Co-I)	Assessment of the infectious diseases pharmacist workforce across the U.S.	Society of Infectious Diseases Pharmacists
R. Stephanie Huang (Co-I)	AR gene rearrangements and AR signaling in prostate cancer	NIH National Cancer Institute
R. Stephanie Huang (PI)	Towards a TIME-informed digital biospecimen to predict cancer combination treatment	NIH NCI Frederick National Laboratory/Leido
R. Stephanie Huang (Advisor)	Targets of Cancer Training Program T32	NIH National Cancer Institute
R. Stephanie Huang (Advisor)	Interdisciplinary Training Program to Transform Graduate Education in Genetics and Genomics T32	NIH National Institute of General Medical Sciences
Pamala Jacobson (PI)	Tacrolimus and Metabolite Analysis in Cell Culture	National Institutes of Health (NIH), Hennepin Healthcare Research Institute
Reena Kartha (PI)	Extracellular Vesicles as Potential Biomarkers and Therapeutic Target in Gaucher Disease	Takeda Cambridge, Ltd.
Reena Kartha (PI)	Translational Pharmacology Research Fellowship	Sanofi-Aventis US
Michael Kotlyar (Project Co-Lead)	Feasibility of Using a Culturally Tailored Conversational Agent for promoting smoking cessation treatment utilization in African Americans who use cigarettes	NIH National Institute on Minority Health

Ling Li (PI)	Impact of Mitochondrial Lipidomic Dynamics and its Interaction with APOE Isoforms on Brain Aging and Alzheimer's Disease	NIH National Institute on Aging
Ling Li (Co-I)	Supplement to DNA Protein Cross-Links: Cellular Effects and Repair Mechanisms	NIH National Institute of Environmental Health Sciences
Ling Li (Co-I)	Supplement O3S1 to MUFA-SIRT1 signaling as a central node regulating healthspan	NIH National Institute on Aging
Ling Li (Advisor)	Functional Multi-omics of Aging Training Grant	NIH National Institute on Aging
Ling Li, Pamala Jacobson (Advisors)	Biostatistics in Genetics and Genomics Training Program	NIH National Institute of General Medical Sciences
Ling Li (Advisory Committee)	Building Interdisciplinary Careers in Women's Health (BIRCWH) Program	National Institutes of Health
Melanie Nicol (Co-I)	Identifying CMV Retinitis as a Reversible Cause of Vision loss in persons with HIV-associated meningitis	NIH National Eye Institute
Melanie Nicol (Co-I)	Encochleated Oral Amphotericin for HIV-related Cryptococcal Meningitis	NIH National Institute of Neurological Disorders & Stroke
Melanie Nicol (Consultant)	Adult human brain tissue cultures to study neuroHIV	NIH National Institute on Drug Abuse
Beshay Zordoky (Advisor)	Fulbright Postdoctoral Fellowship (Mina George)	U.S. Department of State, Bureau of Educational and Cultural Affairs
Beshay Zordoky (Advisor)	Visiting Scholar Training Grant (Mahmoud Elsherif)	U.S. Agency for International Development (USAID)
Beshay Zordoky (Advisor)	Visiting Scholar Training Grant (Engie Elswaf)	U.S. Agency for International Development (USAID)

NEW INTRAMURAL PROJECTS WITH ECP FACULTY

Faculty	Project Description	Sponsor
Angela Birnbaum (Co-PI)	Neurobehavioral Impacts of Medical Cannabis Treatment in Chronic Pain Patients	University of Minnesota
Angela Birnbaum (Co-PI)	Characterization of the use and extent of concentration fluctuation	Women's Health Research Program, University of Minnesota

	of lamotrigine in postmenopausal women with epilepsy	
Jeffrey Bishop (Advisor)	Impact and implications of using pharmacogenomic testing to guide medication therapy in patients with depression: a real-world study leveraging electronic health records and artificial intelligence	University of Minnesota
Jeffrey Bishop (PI)	Pharmacogenetics to guide drug selection in adolescents with depression	UMN STRIDES (Strategic Research Investment for the Development of Early Scientists) Program Grant
Jeffrey Bishop (Advisor)	Patients' perspectives on pharmacogenomics and real-world utilization of test results in a large health system	University of Minnesota
Jeffrey Bishop (Advisor)	ECP Fellowship	University of Minnesota College of Pharmacy
Jeffrey Bishop (Advisor)	Olsteins Graduate Fellowship	University of Minnesota College of Pharmacy
Lisa Coles (Co-I)	Intranasal Delivery of Cortisol Stress Dosing in Patients with Adrenal Insufficiency	UMN, ODAT, CTSI Pediatric Device Innovation Consortium
Lisa Coles (Co-I)	Use of PIVO device for Ketamine PK Sampling in Pediatric Patients	Accelerating Epilepsy Research Fund, University of Minnesota Foundation
Lisa Coles (Advisor)	Melendy Research Scholarship	University of Minnesota College of Pharmacy
Lisa Coles (Advisor)	CTSI Advanced Pathways to Research Program Scholarship (APReP)	Clinical and Translational Science Institute, University of Minnesota
Elizabeth Hirsch (PI)	Optimization of fosfomycin disk diffusion testing via a mouse model to determine the urinary tract colonizing abilities of inner colonies	UMN STRIDES (Strategic Research Investment for the Development of Early Scientists) award
Elizabeth Hirsch (Advisor)	Impact of an antimicrobial stewardship intervention to reduce UA/UC and antimicrobial use in ASB	University of Minnesota College of Pharmacy Melendy Research Scholarship
Elizabeth Hirsch (Advisor)	Coin Fellowship	University of Minnesota
Elizabeth Hirsch (Advisor)	Hadsall-Uden Award for Pharmacy Advancement	University of Minnesota

Elizabeth Hirsch (Advisor)	Summer College of Pharmacy Experiences (SCoPE) Program	University of Minnesota College of Pharmacy
R. Stephanie Huang (PI)	Sex differences in intra-tumor microbiome and their effect in therapeutic outcomes	Microbiome and Cancer Symposium, University of Minnesota
R. Stephanie Huang (PI)	Computational-aided drug development to treat castration-resistant prostate cancer	Office of the Associate Dean for Research, University of Minnesota College of Pharmacy, SURRGE award
R. Stephanie Huang (Advisor)	Summer College of Pharmacy Experiences (SCoPE) Program	University of Minnesota College of Pharmacy
R. Stephanie Huang (Advisor)	Bighley Graduate Fellowship (Yingbo Huang)	University of Minnesota
R. Stephanie Huang (Advisor)	Bighley Graduate Fellowship (Yuting Shan)	University of Minnesota
Pamala Jacobson (PI), Jeff Bishop (Co-I)	Development of a Participant-Controlled PGx Data Repository for Drug Biomarker Discovery	Informatics Institute, University of Minnesota
Reena Kartha (Advisor)	Summer College of Pharmacy Experiences (SCoPE) Program	University of Minnesota College of Pharmacy
Reena Kartha (Advisor)	Melendy Research Scholarship (Chenwei Yan)	University of Minnesota College of Pharmacy
Reena Kartha (Advisor)	Melendy Research Scholarship (Danielle Luettel)	University of Minnesota College of Pharmacy
Reena Kartha (Advisor)	James C. Cloyd Neuropharmacology Fellowship	University of Minnesota College of Pharmacy
Ling Li (PI)	HDL Mimetic Peptides to Mitigate SARS-CoV-2 Infection-Induced Neuroinflammation and Cerebrovascular Injury	SURRGE Program Grant, University of Minnesota College of Pharmacy
Melanie Nicol (PI)	Improving outcomes in HIV-associated opportunistic infections with CNS pharmacokinetics and pharmacodynamics	STRIDES (Strategic Research Investment for the Development of Early Scientists) Program Grant University of Minnesota College of Pharmacy
Robert Straka (Advisor)	Robert J. Straka Fellowship	University of Minnesota

Robert Straka (Advisor)	A Novel Natural Language Processing Enriched Clinical Pharmacology Approach to Identify Optimal Allopurinol Dosing for an Underserved Population at Risk for Gout Using Real-World Data from Electronic Health Records (EHRs)	Doctoral Dissertation Fellowship, University of Minnesota
Beshay Zordoky (PI)	Leveraging Senotherapeutics to Combat Doxorubicin-induced Immunosenscence	Pediatric Cancer Survivorship Working Group, University of Minnesota
Beshay Zordoky (PI)	Deciphering the Role of AMPK in Carfilzomib-induced Cardiovascular Dysfunction	University of Minnesota College of Pharmacy
Beshay Zordoky (Advisor)	Summer College of Pharmacy Experiences (SCoPE) Program	University of Minnesota College of Pharmacy
Beshay Zordoky (Advisor)	Molecular Mechanisms and Cardiovascular Ramifications of Doxorubicin-induced Senescence - Doctoral Dissertation Fellowship (Ibrahim Abdelgawad)	University of Minnesota
Beshay Zordoky (Advisor)	MN Advancing Science, Enhancing Diversity University of Minnesota (M-ASCEND)	Masonic Cancer Center, University of Minnesota

ONGOING EXTERNALLY FUNDED PROJECTS WITH ECP FACULTY

Faculty	Project Description	Sponsor
Angela Birnbaum (Co-PI)	Pharmacokinetic/Pharmacodynamic model in pregnant women with depression to guide sertraline dosing	NIH National Institute of Child Health and Human Development
Angela Birnbaum (Co-I)	Development of a monoclonal antibody to reverse overdose from fentanyl and its analogs: from manufacturing to clinical trials	NIH National Institute on Drug Abuse
Angela Birnbaum (PI), Stephanie Huang (Co-I)	Physiological-based Pharmacokinetics Approach to Determine the Extent of Drug Exposure of Antiepileptic Medications During Pregnancy and Breastfeeding	NIH National Institute of Child Health and Development
Angela Birnbaum (Co-I)	Phase 1a/1b Clinical Trials of Multivalent Opioid Vaccine Components	NIH National Institute on Drug Abuse
Angela K. Birnbaum (Co-I)	Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs	NIH National Institute of Neurological Disorders and Stroke

Angela Birnbaum (Co-I)	Vaccines for Fentanyl and Its Derivatives: A strategy to reduce illicit use and overdose	NIH National Institute on Drug Abuse
Angela Birnbaum (Co-I)	Novel Nanovaccines Against Opioid Use Disorder	NIH National Institute on Drug Abuse
Angela Birnbaum (Co-I)	Medical Cannabis Dosage and Adverse Events in Clinical Practice	Vireo Health, LLC
Angela K. Birnbaum (PI)	Pharsight-University of Minnesota Pharmacometrics Collaboration	Pharsight Corporation
Jeffrey Bishop (Co-I)	Genotype- and phenoconversion-predicted CYP2D6 activity and risperidone exposure	American Association of Colleges of Pharmacy (AACCP)
Jeffrey Bishop (Co-I)	An Informatics Framework for Discovery and Ascertainment of Drug-Supplement Interactions	NIH National Center for Complementary and Integrative Health
Jeffrey Bishop (Advisor)	Comorbidity: Substance Use Disorders and Other Psychiatric Conditions	NIH National Institute on Drug Abuse
Jeffrey Bishop (Advisor)	Developmental Psychopathology T32	NIH National Institute of Mental Health
James C. Cloyd (PI)	Network Pharmacology for Epilepsy Prevention	PrevEp, Inc.
James C. Cloyd (PI)	Licensing Agreement-IV Topiramate	Ligand Pharmaceuticals
James C. Cloyd (Co-PI)	Lysosomal Disease Network	NIH National Institute of Neurological Disorders and Stroke
James C. Cloyd (Co-PI)	Development of Intravenous Baclofen	Allaysis Pharmaceuticals
Lisa Coles (Co-I)	NEOLEV3: A Phase IIb Dose Escalation Study of Levetiracetam	USA Food & Drug Administration (FDA)
Lisa Coles (PI)	AbbVie-UMN Clinical Pharmacology and Pharmacometrics Fellowship	AbbVie, Inc.
Lisa Coles (PI)	Leveraging innate immunity to prevent post-traumatic epilepsy	University of California - Los Angeles (UCLA)

Lisa Coles (PI)	Translational platform for epilepsy therapy and biomarker development in post-traumatic epilepsy	Albert Einstein College of Medicine
Elizabeth Hirsch (Co-I)	Optimal vancomycin exposure target for pulmonary exacerbations in CF	Cystic Fibrosis Foundation
R. Stephanie Huang (Co-I)	Targeting early events in prostate cancer lineage plasticity	NIH National Cancer Institute
R. Stephanie Huang (PI)	Drug Repurposing in Breast Cancer	NIH National Cancer Institute
R. Stephanie Huang (PI)	Genetic Mechanisms Underlying Sexual Dimorphism in Cancer and Response to Therapy	NIH National Cancer Institute
Pamala Jacobson (PI)	Molecular and Cellular Analysis of Allograft Loss in Kidney Transplant Biopsies	National Institutes of Health, Hennepin Healthcare Research Institute
Pamala Jacobson (PI)	Pharmacogenomics Clinical Training Program for Pharmacists in Rural and Underserved Areas in Minnesota	Minnesota Department of Health (MDH)
Pamala Jacobson (PI)	Gut Microbiota and Effect on Immune Suppressants in Transplantation	NIH National Institute of Allergy and Infectious Disease
Reena Kartha (PI)	Translational Pharmacology Research Fellowship	Sanofi-Aventis US
Reena Kartha (PI)	Magnetic Resonance Spectroscopy Biomarkers in Type 3 Gaucher Disease	Sanofi-Aventis US
Reena Kartha (PI)	Dose Optimization of Nervonic Acid-a Potential Therapy to Alleviate Disease Progression in Adrenoleukodystrophy	NIH National Center for Advancing Translational Science
Reena Kartha (PI)	Nervonic Acid-a Potential Therapy to Alleviate Disease Progression in Adrenoleukodystrophy	Ligand Pharmaceuticals, Inc.
Reena Kartha (PI)	Novel Inflammatory Biomarkers Complement 5a and Hecpidin in Patients with Gaucher Disease	Sanofi-Genzyme
Michael Kotlyar (Co-PI)	Feasibility of Using Wearable Technology for Just-in-Time Prediction of Smoking Lapses	NIH National Institute on Drug Abuse
Michael Kotlyar (Co-I)	Bupropion for the Prevention of Postpartum Smoking Relapse	NIH National Institute on Drug Abuse

Ilo Leppik (PI), Angela Birnbaum (Co-I)	Nursing Home Survey Project for Epilepsy	UCB Pharma
Ling Li (Co-I)	Detecting synergistic effects of pharmacological and non-pharmacological interventions for AD/ADRD	NIH National Institute on Aging
Ling Li (Co-PI)	Combined Effects of TBI & Covid19 Developing Alzheimer's	MN Office of Higher Education
Ling Li (Co-I)	Estimation and inference in directed acyclic graphical models for biological networks	NIH National Institute on Aging
Ling Li (PI)	Acute and Long-Term Impact of SARS-CoV-2 Infection and its Interaction with APOE on Cognitive Function and Neuropathology in Aging and Alzheimer's Disease	NIH National Institute on Aging
Ling Li (Co-I)	Deep Learning with Neuroimaging Genetic Data for Alzheimer's Disease	NIH National Institute on Aging
Ling Li (Co-I)	Integrating Alzheimer's Disease GWAS with Proteomic and Metabolomic QTL Data	NIH National Institute on Aging
Ling Li (PI)	HDL Mimetic Peptide-Mediated Enhancement of Neurovascular Function to Mitigate Cerebral Amyloid Angiopathy and Alzheimer's Disease	NIH National Institute on Aging
Melanie Nicol (PI)	Evaluating Antiretroviral Pharmacology in the Female Genital Tract to Optimize HIV Prevention	NIH National Institute of Allergy and Infectious Diseases
Melanie Nicol (Co-I)	Improving Diagnostics and Neurocognitive Outcomes in HIV/AIDS-related Meningitis	NIH National Institute of Neurological Disorders and Stroke
Melanie Nicol (Co-I)	Encochleated Oral Amphotericin for Cryptococcal Meningitis Trial	National Institutes of Health (NIH)
Robert Straka (Co-I)	The Long-Life Family Study (LLFS): Pharmacogenetics (PGx) Administrative Supplement	NIH National Institute on Aging
Beshay Zordoky (Advisor)	Pakistan Government Scholarship	Pakistani Ministry of Higher Education

Beshay Zordoky (Advisor)	Egyptian Government Scholarship	Egyptian Ministry of Higher Education
Beshay Zordoky (PI)	Psychosocial Stress Exacerbates Doxorubicin-induced Cardiovascular Aging	NIH National Heart, Lung, and Blood Institute

ONGOING INTRAMURAL PROJECTS WITH ECP FACULTY

Faculty	Full Project Name	Sponsor
Lisa Coles (Co-I)	Intranasal Delivery of Cortisol Stress Dosing in Patients with Adrenal Insufficiency	The Pediatric Device Innovation Consortium (PDIC), University of Minnesota
Angela Birnbaum (Co-I)	Neurobehavioral Impacts of Medical Cannabis Treatment in Chronic Pain Patients	Medical Discovery on Addiction, University of Minnesota
James C. Cloyd (PI)	Allopregnanolone (ALLO), A Novel Neurosteroid Drug, for Treatment of Status Epilepticus, A Life-threatening Neurological Emergency	Office of Academic Clinical Affairs (OACA), University of Minnesota
James C. Cloyd (Co-PI)	Development of a Prodrug/Enzyme Nasal Spray for Rapid Delivery of Diazepam for Treatment of Seizure Emergencies	Committee for Pharmaceutical Development/CTSI ODAT
Ling Li (PI)	Modeling and Reversing Alzheimer's Pathology via Human Brain Organoids	Faculty Research Development Grant Program, OACA, University of Minnesota
Robert Straka (PI)	Optimizing the identification and prediction of statin intolerance to improve statin adherence using natural language processing and machine learning	CTSI Translational Research Development Program Award (TRDP), University of Minnesota
Robert J. Straka (PI)	Very Important Pharmacogenes in Hmong (VIP-HC) Study (California Cohort)	College of Pharmacy, University of Minnesota

PUBLICATIONS

JOURNAL ARTICLES BY ECP FACULTY

(Key: **ECP Faculty**, **ECP Graduate Students**, **Postdocs and Staff**)

2023 Journal Articles

Abdelgawad, I. Y., Agostinucci, K., Sadaf, B., Grant, M. K., & Zordoky, B. N. Metformin mitigates SASP secretion and LPS-triggered hyper-inflammation in Doxorubicin-induced senescent endothelial cells. *Frontiers in Aging*, 4. <http://dx.doi.org/10.3389/fragi.2023.1170434> 10.3389/fragi.2023.1170434

Agostinucci, K., Grant MKO, Melaku, W., Nair, C., & Zordoky, B. N. (2023). Exposure to Doxorubicin Modulates the Cardiac Response to Isoproterenol in Male and Female Mice. *Pharmaceuticals (Basel, Switzerland)*, 16(3). 10.3390/ph16030391

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Blaes, A. H., Nair, C., Everson-Rose, S., Jewett, P., Wolf, J., & **Zordoky, B.** Psychological measures of stress and biomarkers of inflammation, aging, and endothelial dysfunction in breast cancer survivors on aromatase inhibitors. *Scientific Reports*, 13(1). <http://dx.doi.org/10.1038/s41598-023-28895-4>
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Brown, J. T., **McGonagle, E.**, Seifert, R., Speedie, M., & **Jacobson, P. A.** (2023). Addressing disparities in pharmacogenomics through rural and underserved workforce education. *Frontiers in genetics*, 13, 1082985. [10.3389/fgene.2022.1082985](https://doi.org/10.3389/fgene.2022.1082985)

Camara, E., Safri, A., Ko, C. L., Abdul-Mutakabbir, J. C., Bandali, A., Brown, B. R., & on behalf of the PharmGradWishlist Leadership Team (**Hirsch, E. B.**) (2023). The implications of data aggregation on propagating racial and ethnic disparities within the healthcare landscape: actionable recommendations and consideration for pharmacists. *J Am Pharm Assoc(S1544-3191(23))*, 00324-2.

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Wen, Y.-F., Brundage, R. J., Roman, Y. J., Culhane-Pera, K. A., & **Straka, R. J.** (2023). Population Pharmacokinetics, Pharmacodynamics, and Pharmacogenetics Modeling of Oxypurinol in Hmong Adults with Gout and/or Hyperuricemia.

Wen, Y.-F., Culhane-Pera, K. A., Pergament, S. L., Moua, Y., Vue, B., Yang, T., **Sun, B., . . . Straka, R. J.** (2023). Hmong microbiome AND Gout, Obesity, Vitamin C (HMANGO-C): A phase II clinical study protocol. *Plos one*, 18(2), e0279830.

Wenzler, E., Maximos, M., Asempa, T. E., Biehle, L., Schuetz, A. N., & **Hirsch, E. B.** (2023). Antimicrobial susceptibility testing: An updated primer for clinicians in the era of antimicrobial resistance: Insights from the Society of Infectious Diseases Pharmacists. *Pharmacotherapy*, 43(4), 264-278. 10.1002/phar.2781

Xia, Y., Ling, A. L., Zhang, W., **Lee, A., Su, M. C., Gruener, R. F., Jena, S., Huang, Y.,** Pareek, S., **Shan, Y., & Huang, R. S.** (2024). A Web Application for Predicting Drug Combination Efficacy Using Monotherapy Data and IDACombo. *Journal of cancer science and clinical therapeutics*, 7(4), 253–258.
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Yang, C., Zhang, W., Liu, J., Yao, L., **Bishop, J. R.,** Lencer, R., . . . Lui, S. (2023). Disrupted subcortical functional connectome gradient in drug-naïve first-episode schizophrenia and the normalization effects after antipsychotic treatment. *Neuropsychopharmacology*, 48(5), 789-796. 10.1038/s41386-022-01512-0

Zhang, L., Lizano, P., Xu, Y., Rubin, L. H., **Lee, A. M.,** Lencer, R., . . . **Bishop, J. R.** (2023). Peripheral inflammation is associated with impairments of inhibitory behavioral control and visual sensorimotor function in psychotic disorders. *Schizophrenia Research*, 255, 69-78. 10.1016/j.schres.2023.03.030

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Zhang, W., Sweeney, J. A., **Bishop, J. R.,** Gong, Q., & Lui, S. (2023). Biological subtyping of psychiatric syndromes as a pathway for advances in drug discovery and personalized medicine. *Nature Mental Health*, 1(2), 88--99. <https://doi.org/10.1038/s44220-023-00019-x>

Zhong, R., Xu, Y., Williams, J. W., & **Li, L.** (2023). Loss of TREM2 exacerbates parenchymal amyloid pathology but diminishes CAA in Tg-SwDI mice. *bioRxiv : the preprint server for biology*. 10.1101/2023.11.04.565659

Zhu, F., Xiao, Y., Tao, B., Gao, Z., Gao, X., Zhao, Q., **Bishop, J. R., . . . Lui, S.** (2023). Radiomic features of gray matter in never-treated first-episode schizophrenia. *Cerebral Cortex*, 33(10), 5957-5967.
10.1093/cercor/bhac474

OTHER PUBLICATIONS BY ECP FACULTY

2023 Other Publications by ECP Faculty

Cloyd, J., Coles, L., Kriel, R., & Krach, L. *METHOD OF DELIVERY OF INTRAVENEOUS BACLOFEN.*

Coles, L., Sarafoglou, K., Al-Kofahi, M., & Brundage, R. *FORMULATIONS AND METHODS FOR INTRANASAL DELIVERY OF HYDROCORTISONE.*

Conway, J. M. (2023). Monitoring Drug Therapy, Documentation and Patient Education. *Pharmacy Student Survival Guide.*

Huang, R. Stephanie, & Huang, Y. Preface and a chapter "Sex dimorphism in response to targeted therapy and immunotherapy in non-small cell lung cancer patients: a narrative review. Targeted Therapies in Lung Cancer. AME Publishing Company. <https://book.amegroups.com/post/view/targeted-therapies-in-lung-cancer>

Kartha, R. V., & Orchard, P. J. (2024). Development of Gene Therapies from an Academic Perspective. *Development of Gene Therapies: Strategic, Scientific, Regulatory, and Access Considerations.* Edited by Avery McIntosh, Oleksandr Sverdlov. Taylor & Francis Group, LLC.

Shan, Y., Cheung, L., Zhou, Y., Huang, Y., & Huang, R. S. (2023). A systematic review on sex differences in adverse drug reactions related to psychotropic, cardiovascular, and analgesic medications. vol. 14, 1096366. *Frontiers in pharmacology.* 10.3389/fphar.2023.1096366

Swanson, S. M., Birnbaum, A., Brackett, C., Lipscomb, J., Moniri, N. H., Swaan, P. W., . . . Farrell, D. (2023). *The Report of the 2022-2023 AACP Research and Graduate Affairs Committee.* 8th ed., vol. 87, 100556. *American journal of pharmaceutical education.* 10.1016/j.ajpe.2023.100556

Zhang, W., Maeser, D., Lee, A., Huang, Y., Gruener, R. F., Abdelbar, I. G., . . . Huang, R. S. (2023). *Inferring therapeutic vulnerability within tumors through integration of pan-cancer cell line and single-cell transcriptomic profiles.* bioRxiv : the preprint server for biology. 10.1101/2023.10.29.564598

TEACHING

The College of Pharmacy consistently ranks among the top three pharmacy schools in the country for the quality of its PharmD program. Faculty fill a variety of roles in the educational process, including course director, lecturer, discussant, seminar participant, and others. In addition to these classroom roles, faculty also serve as mentors and advisors to students, providing them with one-on-one training and counsel as they prepare for their careers.

In 2023, ECP faculty contributed significant, didactic education to PharmD classes. This instruction included teaching and directing the required pharmacotherapy series and the pharmaceutical care skills course sequence, as well as teaching elective courses. Instruction to pharmacy students also included experiential education in acute care, geriatric patient care, pediatric infectious disease, and clinical toxicology. The department also offers a research emphasis track for PharmD students which pairs students with an advisor(s) in the Clinical Pharmacology Research Emphasis program. In addition to coursework, students choose a research topic in experimental, translational, or clinical pharmacology for their PharmD paper project.

ECP faculty also teach graduate program classes. While these are primarily designed to support the department's own graduate students, the courses also include students in nursing, public health, geriatrics, and genetics, as well as graduate students in other College of Pharmacy programs.

TEACHING-RELATED METRICS IN ECP

- (unspecified) Students mentored by ECP faculty 34
- Undergraduate students mentored or advised by ECP faculty 9
- Graduate/Professional students mentored or advised by ECP faculty 60

Reported Student Credit Hours by Course Level

Course level	Credit hours	# of sections
1000	51	1
4000	75	2
5000	48	4
6000	3242	34
7000	4985	18
8000	111	62

SERVICE

ECP faculty discover opportunities for service both within and outside the University. The hours spent offering expertise and guidance are a way to give back to students, the community, and the field. In 2023, faculty members served on boards of directors or advisory councils of research organizations and others reviewed grant proposals and/or faculty promotion documents for institutions across the country. While much of the service performed by ECP faculty is performed on behalf of the department, college, and university in which they work, they also support their colleagues and their profession.

SERVICE-RELATED METRICS IN ECP

Service commitments to the discipline or profession	162
Service commitments to the university, college, or department	27
External and public service commitments	19
Professional memberships	55
Professional development activities	7
Peer mentorship relationships	1

ECP GRADUATE PROGRAM

The ECP Graduate Program provides individualized, hands-on learning experiences to those who will become tomorrow's leaders in experimental and clinical pharmacology research and teaching.

The ECP Graduate Program is an innovative, interdisciplinary program that trains students to conduct research utilizing methodology from basic and clinical pharmacology perspectives. Designed specifically for students interested in clinical research, the goal of the program is to advance the science of human pharmacology and therapeutics to improve the safe, effective, and economical use of drugs by patients. Students study such topics as experimental pharmacotherapy, drug metabolism, infectious disease, pharmacometrics, neuropharmacology/neuroscience, and pharmacogenomics. Graduates are prepared for distinguished careers in clinical research.

ECP GRADUATE PROGRAM-RELATED METRICS

- PhD degrees completed 65
- MS degrees completed 9
- ECP program graduates 3
- Students in ECP graduate program 25

ECP DOCTORAL GRADUATES

Name	Advisor	Thesis Title
Ibrahim Abdelgawad, PhD	Beshay Zordoky, PhD; Ling Li, DVM, PhD	Molecular Mechanisms and Cardiovascular Ramifications of Doxorubicin-induced Senescence
Fan Wang, PhD	Melanie Nicol, PharmD, PhD; Angela Birnbaum, PhD	Approaches to Understanding Antiretroviral Pharmacology in Difficult-to-access Tissues for HIV Treatment and Prevention
Rui Zhong, PhD	Ling Li, DVM, PhD	Cerebral Vasculature as a Therapeutic Target to Combat Alzheimer's Disease

FELLOWSHIPS AND AWARDS FOR GRADUATE STUDENTS

Name	Fellowships/Awards
Ibrahim Abdelgawad	Honorable Mention College of Pharmacy Rho Chi Research Day Poster Competition
Charul Avachat	University of Minnesota Doctoral Dissertation Fellowship, ASCPT Network and Community Development award, Student and trainee grant ASCPT
Adeboye Bamgboye	CTSI A-PreP Fellowship
Jessica Barry	American Foundation for Pharmaceutical Education Fellowship
Tiffany Chang	Coin Fellowship
Mohamed Dabour	2nd place College of Pharmacy Rho Chi Research Day Poster Competition

Mary Raphael Daniel	People's Choice Award College of Pharmacy 3 Minute Thesis Competition
Yingbo Huang	Bighley Graduate Fellowship
Alyssa Lantz	University of Minnesota CTSI and University of Michigan 3 Minute Thesis 3rd place
Chenxu Li	Cloyd Fellowship, First place College of Pharmacy Rho Chi Research Day Poster Competition
Yuhan Long	Young Investigator Award, American Epilepsy Society 2023 Annual Meeting
Yuting Shan	Bighley Graduate Fellowship, Cancer Microbiome Seed Fund-Masonic Cancer Center, Runner up College of Pharmacy 3 Minute Thesis competition, Microbiome & Cancer Symposium Award of Excellence, PGRN Presidential Abstract Award
Boguang Sun	Straka Fellowship, ASCPT Presidential Trainee Award, 2022-2023 Teaching Assistant Recognition Award Nomination
Lusi Zhang	University of Minnesota Interdisciplinary Doctoral Fellowship, Olsteins Graduate Fellowship, ECP Fellowship

ECP RESEARCH EMPHASIS TRACK GRADUATES

ECP also provides professional students in the PharmD program an opportunity to specialize in research by participating in the ECP Research Emphasis Track.

Name	Advisor
Kaylyn Billmeyer	Elizabeth Hirsch
Jillian Brooks	Lisa Coles
Lee Cheung	R. Stephanie Huang
Kadiro Gelchu	R. Stephanie Huang
Ryan McFarland	Amanda Klein
Chandini Nair	Beshay Zordoky
Loan Tran	Jacob Brown and David Stenehjem

PUBLICATIONS BY GRADUATE STUDENTS & POSTDOCS

2023 Journal Articles

Abdelgawad, I. Y., Agostinucci, K., Sadaf, B., Grant, M. K., & Zordoky, B. N. Metformin mitigates SASP secretion and LPS-triggered hyper-inflammation in Doxorubicin-induced senescent endothelial cells. *Frontiers in Aging*, 4. <http://dx.doi.org/10.3389/fragi.2023.1170434> 10.3389/fragi.2023.1170434

Alexander L. Ling, Weijie Zhang, **Adam Lee**, Yunong Xia, **Mei-Chi Su**, **Robert F. Gruener**, **Sampreeti Jena**, **Yingbo Huang**, Siddhika Pareek, **Yuting Shan**, and **R. Stephanie Huang**. Simplicity: web-based visualization and analysis of high-throughput cancer cell line screens. *Journal of Cancer Science and Clinical Therapeutics*. 7 (2023): 249-252.

Avachat, C., & Birnbaum, A. K. (2023). Women of childbearing age: What antiseizure medications are they taking? *British journal of clinical pharmacology*, 89(1), 46-48. 10.1111/bcp.15555

Avachat, C., Younis, I. R., & **Birnbaum, A. K.** (2023). Characterization of the US Food and Drug Administration Post-Marketing Commitments and Requirements for Pregnancy and Lactation. *Clinical pharmacology and therapeutics*, 114(6), 1238-1242. 10.1002/cpt.3059

Barry, J. M., French, J. A., Pennell, P. B., Karanam, A., Harden, C. L., & **Birnbaum, A. K.** (2023). Empiric dosing strategies to predict lamotrigine concentrations during pregnancy. *Pharmacotherapy*, 43(10), 998-1006. 10.1002/phar.2856

Baehr, C., Kassick, A. J., **Vigliaturo, J.**, Luengas, D., Khaimraj, A., Pravetoni, M., Averick, S. E., & Raleigh, M. D. (2023). Anti-Strychnine Immunoconjugate Reduces the Effects of Strychnine-Induced Toxicity in Mice. *ACS Chemical Neuroscience*, 14(7), 1291–1298. <https://doi.org/10.1021/acscemneuro.2c00797>

Bixby ML, Salay JM, Krueger AR, Mathers AJ, **Hirsch EB**. Fosfomycin disk diffusion testing among *Klebsiella pneumoniae* results in frequent inner colonies and categorical disagreement based on conflicting breakpoint organization recommendations. *Microbiology Spectrum*. 2023 Mar 6;11(2):e0336322.

Crouse, B., Miller, S. M., Muelken, P., Hicks, L., **Vigliaturo, JR**, Marker, C. L., Guedes, A. G. P., Pentel, PR, Evans, J. T., LeSage, M. G., & Pravetoni, M. (2023). A TLR7/8 agonist increases efficacy of anti-fentanyl vaccines in rodent and porcine models. *Npj Vaccines*, 8(1),107–107. <https://doi.org/10.1038/s41541-023-00697-9>

Dabour, M. S., **Abdelgawad, I. Y.**, **Grant, M. K.O.**, El-Sawaf, E. S., & **Zordoky, B. N.** (2023). Canagliflozin mitigates carfilzomib-induced endothelial apoptosis via an AMPK-dependent pathway. *Biomedicine & Pharmacotherapy*, 164, 114907. <http://dx.doi.org/10.1016/j.biopha.2023.114907> 10.1016/j.biopha.2023.114907

Fike, C. D., Aschner, J. L., **Avachat, C.**, **Birnbaum, A. K.**, & **Sherwin, C. M.** (2023). Multi-dose enteral L-citrulline administration in premature infants at risk of developing pulmonary hypertension associated with bronchopulmonary dysplasia. *Journal of perinatology : official journal of the California Perinatal Association*. 10.1038/s41372-023-01809-y

Fike, C. D., **Avachat, C.**, **Birnbaum, A. K.**, Aschner, J. L., & **Sherwin, C. M.** (2023). Pharmacokinetics of L-Citrulline in Neonates at Risk of Developing Bronchopulmonary Dysplasia-Associated Pulmonary Hypertension. *Pediatric drugs*, 25(1), 87-96. 10.1007/s40272-022-00542-x

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contraception initiation in Malawi. *AIDS* (London, England), 37(14), 2185-2190.
10.1097/QAD.0000000000003686

Leung, J. G., **Zhang, L.**, Markota, M., Ellingrod, V. L., Gerberi, D. J., & **Bishop, J. R.** (2023). A systematic review of clozapine-associated inflammation and related monitoring. *Pharmacotherapy*, 43(12), 1364-1396.
10.1002/phar.2887

Ling, A., Zhang, W., **Lee, A. M.**, Xia, Y., **Su, M.-C.**, **Gruener, R.**, **Jena, S.**, **Huang, Y.**, **Shan, Y.** . . . **Huang, R. S.** (2023). Simplicity: web-based visualization and analysis of high-throughput cancer cell line screens. *Journal of Cancer Science and Clinical Therapeutics*, 7(4), 249-252. 10.26502/jcsct.5079217

Lyu, X., **Illamola, S. M.**, **Marino, S. E.**, **Leppik, I. E.**, Dahmer, S., Lehfeldt, P., **Conway, J. M.** . . . **Birnbaum, A. K.** (2023). Medical Cannabis Received by Patients According to Qualifying Condition in a US State Cannabis Program: Product Choice, Dosing, and Age-Related Trends. *Current therapeutic research, clinical and experimental*, 99, 100709. 10.1016/j.curtheres.2023.100709

Maeser, D., Zhang, W., **Huang, Y.**, & **Huang, R. S.** (2023). A review of computational methods for predicting cancer drug response at the single-cell level through integration with bulk RNAseq data. *Current opinion in structural biology*, 84, 102745. 10.1016/j.sbi.2023.102745

Mei-Chi Su, Susheel Kumar Nethi, Pavan Kumar Dhanyamraju, Swayam Prabha. *Nanomedicine Strategies for Targeting Tumor Stroma. Cancers* (Basel). 2023 Aug 17;15(16):4145. doi: 10.3390/cancers15164145.

Oyebanji OA, Brewer C, Bayless S, Schmeusser B, Corbin DA, Sulentic CEW, **Sherwin CMT**, Chen Y, Rapp CM, Cates EE, **Long Y**, Travers JB, Rohan CA. "Topical photodynamic therapy generates bioactive microvesicle particles: evidence for a novel pathway involved in immunosuppressive effects." *J Invest Dermatol*, 2023 Jul;143(7):1279-1288.e9. <https://doi.org/10.1016/j.jid.2022.12.018>

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Sherwin, C. M., Tran, N. K., Sullivan, K., Wead, S., **Birnbaum, A. K.**, **Avachat, C.**, . . . Kagan, R. J. (2023). Exploring the Past to Inform the Future to Optimize the Pharmacokinetics of Vancomycin in Children With Severe Burn Injuries. *Journal of burn care & research : official publication of the American Burn Association*, 44(2), 353-362. 10.1093/jbcr/irac147

Song D, Crouse B, **Vigliaturo J**, Wu MM, Heimisdottir D, Kassick AJ, Averick S, Raleigh MD, and Pravetoni M. Multivalent Vaccination Strategies Protect against Exposure to Polydrug Opioid and Stimulant Mixtures in Mice and Rats. *ACS Pharmacol. Transl. Sci.* 202

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Weijie Zhang, **Adam M Lee**, **Sampreeti Jena**, **Yingbo Huang**, Yeung Ho, Kiel T. Tietz, Conor R Miller, **Mei-Chi Su**, Joshua Mentzer, Alex Ling, Yingming Li, Scott M Dehm, **R. Stephanie Huang**. Computational drug discovery for castration-resistant prostate cancers through in vitro drug response modeling. *PNAS*. 2023 Apr 25;120(17): e2218522120. doi: 10.1073/pnas.2218522120. Epub 2023 Apr 17.

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Xia, Y., Ling, A. L., Zhang, W., **Lee, A.**, **Su, M. C.**, **Gruener, R. F.**, **Jena, S.**, **Huang, Y.**, Pareek, S., **Shan, Y.**, & **Huang, R. S.** (2024). A Web Application for Predicting Drug Combination Efficacy Using Monotherapy Data and IDACombo. *Journal of cancer science and clinical therapeutics*, 7(4), 253–258. <https://doi.org/10.26502/jcsct.5079218>

Zhang, L., Lizano, P., Xu, Y., Rubin, L. H., **Lee, A. M.**, Lencer, R., . . . **Bishop, J. R.** (2023). Peripheral inflammation is associated with impairments of inhibitory behavioral control and visual sensorimotor function in psychotic disorders. *Schizophrenia Research*, 255, 69-78. 10.1016/j.schres.2023.03.030

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Zhang, W., **Lee, A. M.**, **Jena, S.**, **Huang, Y.**, Ho, Y., Tietz, K. T., Miller, C. R., **Su, M. C.**, Mentzer, J., Ling, A. L., Li, Y., Dehm, S. M., & **Huang, R. S.** (2023). Computational drug discovery for castration-resistant prostate cancers through in vitro drug response modeling. *Proceedings of the National Academy of Sciences of the United States of America*, 120(17), e2218522120. <https://doi.org/10.1073/pnas.2218522120>

Zhang, W., Maeser, D., **Lee, A.**, **Huang, Y.**, **Gruener, R. F.**, **Abdelbar, I. G.**, . . . **Huang, R. S.** (2023). Inferring therapeutic vulnerability within tumors through integration of pan-cancer cell line and single-cell transcriptomic profiles.. *bioRxiv : the preprint server for biology*. 10.1101/2023.10.29.564598

Zhong, R., Xu, Y., Williams, J. W., & Li, L. (2023). Loss of TREM2 exacerbates parenchymal amyloid pathology but diminishes CAA in Tg-SwDI mice. *bioRxiv : the preprint server for biology*. 10.1101/2023.11.04.565659

PRESENTATIONS BY GRADUATE STUDENTS & POSTDOCS

2023 Abstracts, Posters, and Presentations

Avachat, C. "Changes in total daily dose of lamotrigine and levetiracetam during pregnancy: Reflection on current clinical practice at US tertiary epilepsy centers" International League Against Epilepsy annual meeting, Dublin, Ireland, September 2023

Avachat, C., Long, Y., Patel, S.I., Reeder, S.A., Leppik, I.E., Birnbaum, A.K. "Characterization of lacosamide pharmacokinetics in older adults with epilepsy". American Academy of Neurology annual meeting, Boston, Massachusetts, April 2023 (Poster)

Avachat, C. "Characterization of the US Food and Drug Administration Post-Marketing Commitments and Requirements for Pregnancy and Lactation ". American Society of Clinical Pharmacology and Therapeutics annual meeting, Atlanta, Georgia, March 2023 (Poster)

Avachat, C. "Making sense of sparse pharmacokinetic data using Phoenix NLME", for Experimental and Clinical Pharmacology Pharmacometrics Webinar sponsored by Certara, January 2023

Avachat, C., Long, Y., Patel, S.I., Birnbaum, A.K., "Prescribing trends of lamotrigine in postmenopausal women", Women's Health Research Conference, Minneapolis, Minnesota, February 2023 (Poster)

Bamgboye AO, Rosenthal E, Cloyd JC, Kapur J, Silbergleit R, Chamberlain J, Zehtabchi S, Bleck T, Quigg M, Shinnar S, Coles LD. Use of Ketamine Simulations to Guide Dose Selection and Optimal Sampling in a Status Epilepticus Trial. American Epilepsy Society Annual Meeting; December 2023; Orlando, FL.

Barry, JM, van Hasselt C, Evans M, Hirsch E, Dunitz J, Shockley S, Billings J, Illamola SM. Exposure-response relationship of vancomycin and nephrotoxicity in cystic fibrosis patients with methicillin-resistant *Staphylococcus aureus* infections. American Conference on Pharmacometrics. Nov 2023. Washington, D.C.

Bixby ML, Collins LB, Salay JM, Hirsch EB. Comparison of growth rates among *Klebsiella pneumoniae* (KP) isolates stratified by the production of inner colonies during fosfomycin disk diffusion (DD) testing. eFlash Presentation, ECCMID 2023. April 2023. (Poster)

Huang Y, Shan Y, Zhang W, Printzis C, Pesce L, Stranger BE, Huang RS. Identification of sex-specific molecular features in glioblastoma. American Society of Human Genetics (ASHG) annual meeting. 2023. Washington, DC. (Poster)

Leppik IE, Remmel R, Long Y, Walczak T, Illamola S, Zhang S, Birnbaum AK. "Perampanel Blood Levels in Practice." American Epilepsy Society 2023 Annual Meeting, 2023 Dec. (Poster)

Long Y, Pennell PB, Meador KJ, Karanam A, Voinescu PE, Birnbaum AK. "Characterization of Estradiol, Estrone, and Progesterone Concentrations in Subpopulations of Pregnant Patients with Epilepsy on Lamotrigine." American Epilepsy Society 2023 Annual Meeting, 2023 Dec. (Poster and Platform Presentation)

M. Mohamed, C. Dorr, D. Schladt, A. Saqr, R. Rimmel, G. Onyeaghala, W. Guan, B. Wu, R. B. Mannon, A. Matas, W. Oetting, A. Israni, P. Jacobson. Possible Regulatory Variant in the CYP3A Gene Association with Tacrolimus (TAC) Troughs in African American Kidney Transplant Recipients". AJT, Volume 23, Issue 6, Supplement 1. Oral Presentation American Transplant Congress 2023 – June 3-7, 2023, San Diego, CA, USA (Abstract)

Mei-Chi Su, Agnish Dey, Ganesh M Mugundu, Aman P. Singh (2023). Development of a Multiscale Mechanism-Based Cellular Kinetic –Pharmacodynamic (CK-PD) Model for Targeted Bicistronic CAR-T Cell Therapy. ASCPT 2023 (Poster)

Mohamed M., Saqr A., Onyeaghala G., Rimmel R., Staley C., Dorr C., Teigen L., Wu B., Guan W., El-Rifai R., Oetting W., Matas A., Israni A., Jacobson P. Multiple Mycophenolic Acid Enterohepatic Recirculation Peaks After Oral MMF in Kidney Transplant Recipients. AJT, Volume 23, Issue 6, Supplement 1. Poster Presentation American Transplant Congress 2023 – June 3-7, 2023, San Diego, CA, USA.

Mohamed S. Dabour, Ibrahim Y. Abdelgawad, Marianne K.O. Grant, Engie Elsayaf, Beshay N. Zordoky. Canagliflozin Mitigates Carfilzomib-induced Endothelial Apoptosis via an AMPK-dependent Pathway. Masonic Cancer Center Research Symposium 2023, University of Minnesota, Minnesota.

Shan, Y, Sex Differences in Intratumor Microbiome Have Implications on Cancer Risk and Drug Response. Selected oral presentation at Pharmacogenomic Global Research Network (PGRN) annual conference, 2023, Memphis, Tennessee. (Presentation)

Shan, Y, Sex Differences in Intratumor Microbiome Have Implications on Cancer Risk and Drug Response. Masonic Cancer Center (MCC) Microbiome & Cancer Symposium. 2023, Minneapolis, MN. (Presentation)

Sun B; Zhang R; Chi CL; Straka RJ et al. Development and validation of the pharmacological statin-associated muscle symptoms risk stratification (PSAMS-RS) score using real-world electronic health record data. ACCP Annual Conference: November 11-13, 2023, Dallas, Texas

Sun B; Zhang R; Chi CL; Straka RJ et al. Development and Application of Pharmacological Statin-Associated Muscle Symptoms Phenotyping Algorithms Using Structured and Unstructured Electronic Health Records Data. AMIA Annual Symposium: November 12-15 2023, New Orleans, Louisiana

Sun B; Zhang R; Chi CL; Straka RJ et al. Optimizing the identification and prediction of statin intolerance to improve statin adherence using natural language processing and machine learning. AMIA Informatics Summit: March 13-16, 2023, Seattle, Washington (Poster)

Vassar AM, Long Y, Birnbaum AK, Rimmel R, Patel S, Leppik IE. "Postanesthetic Rufinamide Syndrome." American Epilepsy Society 2023 Annual Meeting, 2023 Dec. (Poster)

Vigliaturo, Jennifer, Carly Baehr, Andrew Kassick, Diego Luengas, Marco Pravetoni, Saadyah Averick, and Michael Raleigh. "Determination of Strychnine Levels in Serum and Brain via LC-MS/MS in Mice Vaccinated Against Strychnine." (2023). ASPET; 2023, May 18th – 21st in St. Louis, MO.

X Lyu, S Illamola, IE Leppik, SE Marino, S Dahmer, P Lehfeltdt, JM Conway, S Park, AK Birnbaum, Medical Cannabis and Seizure Control in Minnesota Medical Cannabis Program, American Epilepsy Society 2023 Annual Meeting, Dec. 2023 (Poster)

X Lyu, S Illamola, S Dahmer, P Lehfeltd, **IE Leppik, AK Birnbaum**, Adverse events of medical cannabis reported to a safety call center, International Cannabinoid Research Society Annual Meeting June. 2023 (Abst. 230). (Poster)

Zhang, Lusi, "Peripheral Inflammation, Cardiometabolic Risk, and Cognitive Function in Psychosis: Genomic and Proteomic Analyses." Presented at West China Hospital of Sichuan University. Sichuan, Chengdu, P.R. China (1/3/2023).

Zhang, Lusi, "Peripheral Inflammation Relationships with Cognitive Deficits and Genetic Factors in Psychosis." One of the three presentations of the 2023 European Congress of Psychiatry (EPA) Symposium entitled "Neuroimmunogenetics of Major Psychoses." Paris, France (3/25-28/2023).

Zhang M, **Shan Y, Huang RS**. Akkermansia muciniphila: A Female-enriched Bacteria that Impacts the Response of Multiple Cancer Therapeutics. Rho Chi Research Day. 2023, *Minneapolis, MN*.

ECP RESEARCH SEMINAR (ECP 8100)

Both graduate students and postdoctoral associates present at the weekly research seminar.

Date - Spring 2023	Title	Presenter
January 25	Drug Testing Basics for Different Laboratory Settings	Jennifer Brown , PhD, MLS(ASCP)CM, Medical Laboratory Sciences, CAH
February 1	The Protective Effects of Canagliflozin against Carfilzomib-induced Endothelial Toxicity	Mohamed Dabour , PhD student, ECP
February 8	Repurposing Nervonic acid: a Naturally Occurring Dietary Fatty Acid for Adrenoleukodystrophy	Chenxu Li , PhD student, ECP
February 15	New Guidelines for the Management of Heart Failure	Orly Vardeny , PharmD, MS, FAHA, FHFA, Adjunct Faculty, ECP
February 22	Theoretically Understanding Volume of Distribution During Pregnancy	Yuhan Long , PhD student, ECP
March 15	Pharmacokinetics/Pharmacodynamics Scaled: How Antimicrobials Move Through/Affect the Social Body	Lorenzo Servitje , PhD, MPH, Assoc. Prof. of Literature and Medicine, Dept. of English, Director of Health, Medicine & Society, Lehigh University, Bethlehem, PA
March 22	Applications of Personalized Medicine Approaches in the Critically Ill	Moataz Mohamed , PhD student, ECP
March 29	Ketamine: A Treatment for Status Epilepticus	Adeboye Bamgboye , PhD student, ECP
April 5	Explore Sex Differences in Pan-cancer Intratumor Microbiome	Yuting Shan , PhD student, ECP
April 12	Strategies for Conducting your First Peer Review	Sarah Jane Brown , MSc, College of Pharmacy & Medical School, Duluth Campus Librarian, Health Sciences Library, UMN
April 26	Bullying and Bias in Science	ECP DEI Task Force , Panel Discussion moderated by Adam Lee , PhD, and Reena Kartha , PhD

Date - Fall 2023	Title	Presenter
September 13	ECP Lab Safety Training Seminar	Rebecca Cuellar , PhD, College Safety Officer Jodi Oglvie , PhD & Nancy Rolsted , MS, RBP, DEHS Co-Presenters
September 20	Conversations with Experts - Collaborative research to optimize doses for prevention and treatment of deadly infections	Melanie Nicol , PharmD, PhD, Associate Professor, and Caleb Skipper , MD, Assistant Professor of Medicine, Division of Infectious Diseases & International Medicine, Univ. of Minnesota
September 27	Psychosocial stress exacerbates doxorubicin - induced cardiotoxicity in adult mice	Mary Raphael Daniel , PharmD, ECP PhD student
October 4	Industry Pharmacist: Path to a Career in Medical Publications	Thao Luu , PharmD, Deciphera Pharmaceuticals (Oncogene), CoP Alumna
October 11	Gene Therapies: Unveiling the Promise of Cures and Confronting the Cost Burden	Mohamed Duklef , ECP MS student
October 18	Clinically Relevant Herb-Drug Interactions: A 30-year Historical Perspective Second Annual ECP Toxicology Seminar Sponsored by the Speedie-SafetyCall Endowment Fund	Bill J. Gurley , PhD, Principal Scientist, National Center for Natural Products Research, School of Pharmacy, University of Mississippi
November 1	Connections between SARS-CoV-2 and Alzheimer's Disease	Holly Korthas , PhD, Post-Doctoral Associate Ling Li Lab
November 8	Investigation of Enterobacterales inner colonies during fosfomycin susceptibility testing	Morgan Bixby , ECP PhD student
November 15	Fentanyl abuse epidemic: current and emerging treatments	Jenny Vigliaturo , ECP MS student
November 29	Conversations with Experts - Psychiatric Pharmacogenomics: From Research to Clinical Care and Back Again	Lusi Zhang , PharmD, MHI, ECP graduate student, and Jeff Bishop , PharmD, MS, Associate Professor
December 6	Identifying New Therapies for Breast Cancer Patients Via Drug Response Modeling	Robert Gruener , PhD, Post-Doctoral Associate, R. Stephanie Huang Lab