



Department of Experimental and Clinical Pharmacology

2022 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 (2022: July 2021-June 2022). 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: www.eoaa.umn.edu.

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 2022 annual report, I once again take pride in sharing several highlights of various achievements by our Department of Experimental and Clinical Pharmacology (ECP).

Our ECP department continues to succeed in achieving significant accomplishments demonstrating our collective commitment to the research, education, and service missions of our College. By maintaining our focus on effectiveness and impact while respecting the importance of self-care, we have concluded a year where adaptation, flexibility and strategic investments in our collective engagements have paid off in terms of key measures of success.

The efforts and commitments made by ECP faculty, staff, and students over the 2022 calendar year are reflected by our strong performance research metrics:

- sponsored award expenses grew from 2021 numbers to ~\$4 million in 2022
- a consistent 23% faculty salary offset in 2022
- 77 peer-reviewed articles were published by ECP faculty in 2022
- a further increase in new grants received in 2022 to 46 (up from 38 in 2021)

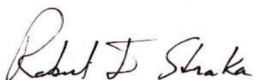
These metrics, along with our strong record of contributions to the teaching and service missions of our college, reflect well on the exceptional dedication of our faculty, staff, and students. Even as we exit the challenges of the pandemic and the departure of several of our faculty, our entire ECP department, including staff and students, achieved new heights of accomplishments. Our department's success continues while we share in the College's collective vision of re-imagining our new professional program and navigate the ongoing challenges facing higher education. As we prepare for our next (Fall 2023) Collegiate Accreditation visit, I believe we should take stock in the outstanding record of achievements our students, staff, and faculty have realized.

Since our 2021 report, the personnel changes we have realized include the retirement of long time UMN Professors Drs. Richard Brundage and Debra Skaar, in addition to Dr. Mahmoud Al-Kofahi. We wish them all the very best and thank them for their outstanding service and dedication to the department and college over their years of tenure. At the same time, we welcome the opportunity to launch a new hire in the Pharmacometrics field that is ongoing at the time of this writing.

ECP is looking forward to new challenges and opportunities that will be forthcoming. I am confident that our department will continue to excel. I take 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



R Stephanie Huang, PhD, was promoted to Professor with tenure in May 2022. Dr. Huang's research and scholarship achievements are highly impressive. They have included 98 referred research publications, many as first or senior author in high-impact journals and numerous national and regional grants, including two R01 grants as well as foundation grants in support of her work in investigating genomic biomarkers that predict response to anticancer therapies. Her work in repurposing commercially available drugs for anticancer therapeutics has significant translational implications and as such has earned her high praise from her referees supporting her promotion. Dr. Huang is an active educator of both the professional and graduate students in the College of Pharmacy and has a very active role in graduate education in two other programs. At times mentoring and advising more than nine graduate students,

she has been formally recognized for her skills as a mentor by way of receiving a COGS (Council of Graduate Students) Outstanding Advisor Award in 2020. She has served at the NIH and various other national committees, and holds leadership roles in supporting our college's pharmacogenomic and precision medicine initiatives.



Scott A. Chapman, PharmD, was promoted to Professor (term) in May 2022. His clinical expertise and research accomplishments are focused in the field of critical care medicine, specifically in areas related to coagulation and anticoagulation. Related areas of his scholarship and teaching include the management of electrolytes in acute care settings and bleeding events for transplant patients. Dr. Chapman has also leveraged his extensive experience as a clinical practitioner in this field to publish works related to the scholarship of experiential learning and assessment during pharmacy practice experiences leading to a white paper titled, "Striving for Excellence in Experiential Education." Dr. Chapman continues his research through engagement in the Collaborative Analytics for EHR and Real-World Data, as part of an NIH sponsored initiative. He has served on various national committees with ACCP

and has contributed to various service roles with the Society of Critical Care Medicine and has also played a significant recent role in the college by serving as the co-director of Experiential Education and various other collegiate committees.

DEPARTMENT MEMBERS

FACULTY

Mahmoud Al-Kofahi, DDS, PhD
Assistant Professor

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

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

Richard C. Brundage, PharmD, PhD, FISO, FCP
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

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

Reena Kartha, PhD
Research Assistant Professor

Mark N. Kirstein, PharmD
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
Associate Professor

Melanie R. Nicol, PharmD, PhD
Associate Professor

Leo J. Sioris, PharmD
Professor

Debra J. Skaar, PharmD, FCCM
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

Kyle Baron, PharmD, PhD
Assistant Professor

Andrew Behm, PharmD, CGP
Assistant Professor

Alexander Berg, PharmD, PhD, FCP
Associate Professor

Ashley Brown, PharmD
Assistant Professor

Samuel Callisto, PhD
Assistant Professor

Jason Chittenden, PhD
Assistant Professor

David Gregornik, PharmD
Associate Professor

John Gualtieri, PharmD
Assistant Professor

Serge Guzy, PhD
Professor

Silvia M Illamola, PharmD, 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

Mark Robbins, PhD, JD
Associate Professor

Samuel Roiko, PhD
Assistant Professor

Ahmed H. Salem, PhD
Professor

Kyriakie Sarafoglou, MD
Associate 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

Mary A. Ullman, PharmD

Associate Professor

Brian Van Ness, PhD

Professor

Orly Vardeny, PharmD, BCPS, FHFSA

Associate Professor

STAFF

Sandra Bowers

Researcher, Birnbaum Research Program

Lindsey Collins

Junior Scientist, Nicol Research Program

Sheena Dufresne

Study Coordinator, Kotlyar Research Program

Lori Endsley

MTRF Administrator

James Fisher

Technical Director, CPAS Laboratory

Katherine Goffin

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, Marino and Jacobson Research Programs

Adam M. Lee, PhD

Research Associate, Bishop Research Program

Erin McGonagle

Staff, Precision Medicine Grand Challenge

Zack McGough, M.Ed.

Department Administrator, ECP Office

Usha Mishra, MS

Assistant Scientist, Center for Orphan Drug Research

Rachel Moniz

Researcher, Birnbaum Research Program

Becky Palapala

Finance & Communications Specialist, ECP Office

Marcia Terluk, PhD

Researcher, Center for Orphan Drug Research

Susan Williford, M.Ed.

Graduate Program Coordinator, ECP Office

POSTDOCS, FELLOWS, & VISITING SCHOLARS

Benu George, PhD

Advisor: Beshay Zordoky, PhD

Vasudeva Reddy Dodda, PhD

Advisor: Ramaiah Muthyala, 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

NEW & CONTINUING GRADUATE STUDENTS

PhD PROGRAM

Ibrahim Abdelgawad, BS	Advisor: Beshay Zordoky, PhD; Ling Li, DVM, PhD
Charul Avachat, MS	Advisor: Angela Birnbaum, 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
Mohamed Dabour, MS	Advisor: Beshay Zordoky, PhD
Yingbo Huang, MS	Advisor: R. Stephanie Huang, PhD
Mu'taz Jaber, PharmD	Advisor: Richard C. Brundage, PharmD, PhD; Mahmoud Al-Kofahi, DDS, 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
Siddhee Anand Sahasrabudhe, MS	Advisor: Reena Kartha, PhD; 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
Takuto Takahashi, MD	Advisor: Mark Kirstein, PharmD; Mahmoud Al-Kofahi, DDS, PhD
Fan Wang, MS	Advisor: Melanie Nicol, PharmD, PhD; Angela Birnbaum, PhD
Ya-Feng (Jay) Wen, PharmD	Advisor: Robert J. Straka, PharmD
Lusi Zhang, , MHI, PharmD	Advisor: Jeff Bishop, PharmD, MS
Rui Zhong, BS	Advisor: Ling Li, DVM, PhD

MASTERS PROGRAM

Mary Raphael Daniel, PharmD	Advisor: Beshay Zordoky, PhD
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 more than fifteen years.

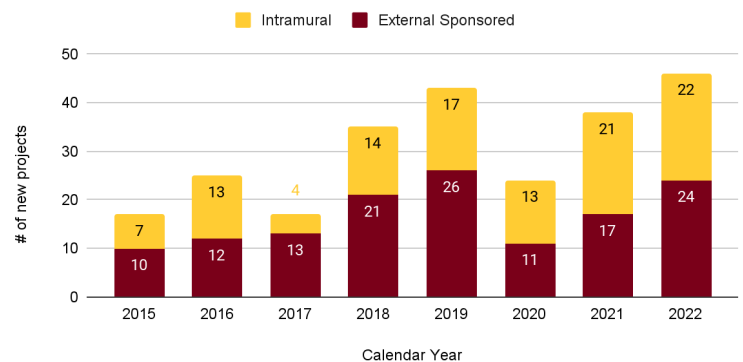
Our faculty routinely present important research at national and international conferences, lecture and collaborate across the country, serve as reviewers and editorial board members of international journals, hold leadership positions in national organizations, and serve on review committees for National 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: 46
 - Intramural: 22
 - External sponsored: 24
- Research endeavors result in various outputs, including:
 - Articles in peer-reviewed publications: 77
 - Books, chapters and other publications: 6

New Projects by Type

2015-2022

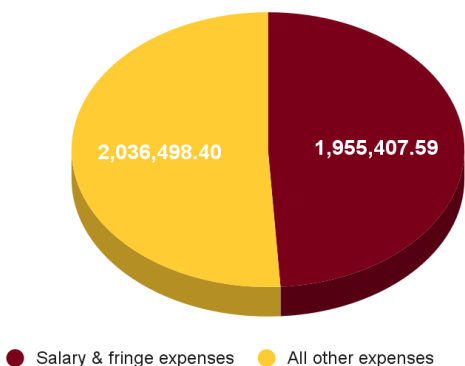


Financials of Sponsored Projects in FY2022

- Expenditures by category
 - Salary and Fringe \$1,955,408
 - Other Expenses \$2,036,498
 - Total \$3,991,906
- Percentage of department faculty salaries supported by sponsored projects: 22.9%
 - Salary offset percentage held steady at 22% for the year (22.8% in FY20, 22% in FY21).

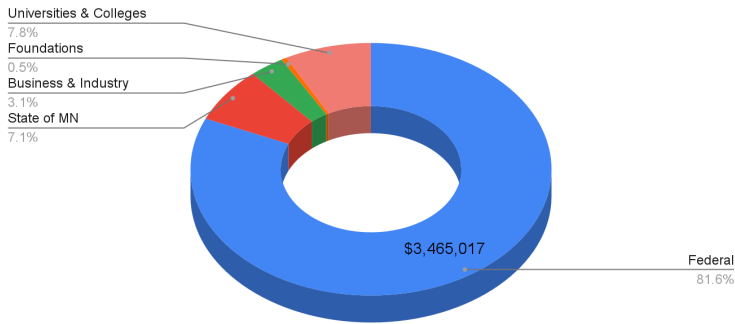
Percent of Expenditures by Category

3,991,906



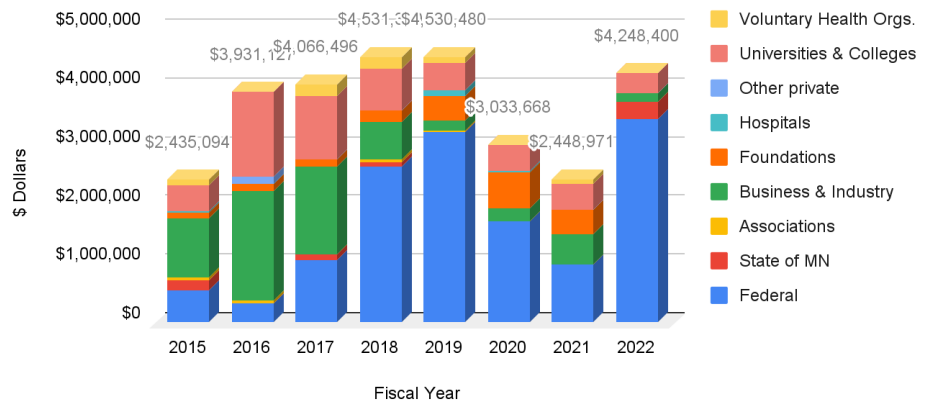
Sponsored Awards by Source (FY22)

Total: \$4,248,400



Sponsored Awards by Source (FY15-FY22)

(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
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
Jeffrey Bishop (Mentor)	Patients' perspectives on pharmacogenomics and real-world utilization of test results in a large health system	American Association of Psychiatric Pharmacists
Jeffrey Bishop (Co-I)	Genotype- and phenoconversion-predicted CYP2D6 activity and risperidone exposure	American Association of Colleges of Pharmacy (AACP)
Lisa Coles (PI)	Translational platform for epilepsy therapy and biomarker development in post-traumatic epilepsy	Albert Einstein College of Medicine
Lisa Coles (PI)	Leveraging innate immunity to prevent post-traumatic epilepsy	University of California, Los Angeles (UCLA)
Lisa Coles (PI)	AbbVie-UMN Clinical Pharmacology and Pharmacometrics Fellowship	Abbvie, Inc.
Lisa Coles (Co-I)	NEOLEV3: A Phase IIb Dose Escalation Study of Levetiracetam	USA Food and Drug Administration (FDA)
James C. Cloyd (PI)	Development and performance of a LC-MS Triple Drug Assay of Plasma Concentration following Administration of a Triple Drug Combination in Rats	PrevEp, Inc.
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-PI)	Towards a TIME-informed digital biospecimen to predict cancer combination treatment	NIH NCI Frederick National Laboratory
R. Stephanie Huang (Mentor)	Evaluating Genetic Risk Factors of hepatoblastoma onset and survival	St. Baldrick's Foundation

R. Stephanie Huang (Co-I)	Targeting early events in prostate cancer lineage plasticity	NIH National Cancer Institute
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)	Estimation and inference in directed acyclic graphical models for biological networks	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)	Detecting synergistic effects of pharmacological and non-pharmacological interventions for AD/ADRD	NIH National Institute on Aging
Reena Kartha (PI)	Magnetic Resonance Spectroscopy Biomarkers in Type 3 Gaucher Disease	Sanofi-Aventis US
Reena Kartha (PI)	Translational Pharmacology Research Fellowship	Sanofi-Aventis US
Pamala Jacobson (PI)	PGx Certificate Program for the Healthcare Workforce in Rural and Underserved Areas of Minnesota	Minnesota Department of Health (MDH) Office of Rural Health and Primary Care
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)	Genetic Variants Associated with Tacrolimus Metabolism	National Institutes of Health, Hennepin Healthcare Research Institute
Beshay Zordoky (Advisor)	Pakistan Government Scholarship	Pakistani Ministry of Higher Education
Beshay Zordoky (Advisor)	NIH T32 Training Grant "Functional Proteomics of Aging"	NIH National Institute on Aging

NEW INTRAMURAL PROJECTS WITH ECP FACULTY

Faculty	Project Description	Sponsor
Angela Birnbaum (Co-PI)	Characterization of the use and extent of concentration fluctuation of lamotrigine in postmenopausal women with epilepsy	Women's Health Research Program, University of Minnesota
Jeffrey Bishop (Mentor)	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 (Mentor)	Patients' perspectives on pharmacogenomics and real-world utilization of test results in a large health system	College of Pharmacy, University of Minnesota
Jeffrey Bishop (Mentor)	Establishing a research database to evaluate psychiatric pharmacogenomic testing across a large Minnesota health system	University of Minnesota Melendy/Peters Scholarship
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
Elizabeth Hirsch (Mentor)	Expression of fosfomycin-resistant linked genes in <i>Klebsiella pneumoniae</i> inner colony and parent isolates	University of Minnesota Undergraduate Research Opportunities Program (UROP)
Elizabeth Hirsch (Advisor)	Coin Fellowship	University of Minnesota
Elizabeth Hirsch (Mentor)	Comparison of <i>Escherichia coli</i> parent isolates to inner colony (IC) isolates in fosfomycin disk diffusion testing	University of Minnesota Undergraduate Research Opportunities Program (UROP)
R. Stephanie Huang (Advisor)	ECP Fellowship	University of Minnesota
Pamala Jacobson (Advisor)	ECP Fellowship	University of Minnesota
Reena Kartha and Lisa Coles (Advisors)	James C. Cloyd Neuropharmacology Fellowship	University of Minnesota

Ling Li (PI)	Modeling and Reversing Alzheimer's Pathology via Human Brain Organoids	Office of Academic Clinical Affairs (OACA), University of Minnesota
Melanie Nicol (Mentor)	Host modulators of tenofovir exposure and efficacy in the female genital tract	CTSI TL1, University of Minnesota
Melanie Nicol (Mentor)	Gene Expression of Drug Metabolizing Enzymes and Transporters and Immune Cells in the Female Genital Tract	Summer College of Pharmacy Experiences (SCoPE) Program
Melanie Nicol (Advisor)	Penetration of antiviral drugs in the female genital tract	Doctoral Dissertation Fellowship University of Minnesota
Robert Straka (Advisor)	Robert J. Straka Fellowship	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
Beshay Zordoky (Advisor)	Doctoral Dissertation Fellowship	University of Minnesota
Beshay Zordoky (Mentor)	Sex differences in doxorubicin-induced senescence	CTSI Pathways to Research Program (PReP)
Beshay Zordoky (Mentor)	Protective effects of canagliflozin against carfilzomib-induced cardiovascular dysfunction	CTSI Advanced Pathways to Research Program (APReP)
Beshay Zordoky (Mentor)	Metformin prevents doxorubicin-induced SASP expression in endothelial cells	Summer College of Pharmacy Experiences (SCoPE) Program
Beshay Zordoky (Co-I)	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 (PI), Stephanie Huang (Co-I)	Physiological-based Pharmacokinetics Approach to Determine the Extent of Drug Exposure of Antiseizure 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)	Nursing Home Survey Project for Epilepsy	UCB Pharma
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)	An Informatics Framework for Discovery and Ascertainment of Drug-Supplement Interactions	NIH National Center for Complementary and Integrative Health
Jeffrey Bishop (Mentor)	Comorbidity: Substance Use Disorders and Other Psychiatric Conditions	NIH National Institute on Drug Abuse
Richard Brundage (PI)	Ph2a SQ HC Infusion Pump in Congenital Adrenal Hyperplasia IND125,640	DHHS Food and Drug Administration
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-I), Lisa Coles (Co-I), Reena Kartha (Co-I)	Identifying Biological Signatures of N-acetylcysteine for Non-Suicidal Self-Injury in Adolescents	NIH National Center for Complementary and Integrative Health
James C. Cloyd (Co-I), Lisa Coles (Co-I)	Epilepsy Bioinformatics Study for Antiepileptogenic Therapy (EpiBioS4Rx),	NIH National Institute of Neurological Disorders and Stroke
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 (PI)	The Role of Beta-Catenin in the Pathophysiology of Infantile Spasms	Tufts University
Elizabeth Hirsch (Co-I)	Optimal vancomycin exposure target for pulmonary exacerbations in CF	Cystic Fibrosis Foundation
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)	Pharmacogenomics Clinical Training Program for Pharmacists in Rural and Underserved Areas in Minnesota	Minnesota Department of Health (MDH)
Pamala Jacobson (Mentor)	Variants Associated with Tacrolimus Metabolism in Kidney Transplant Recipients in Hepatic Cells	NIH National Institute of Allergy and Infectious Disease
Pamala Jacobson (PI)	Gut Microbiota and Effect on Immune Suppressants in Transplantation	NIH National Institute of Allergy and Infectious Disease
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)	Translational Pharmacology Research Fellowship	Genzyme Corporation
Reena Kartha (PI)	Novel Inflammatory Biomarkers Complement 5a and Hecpidin in Patients with Gaucher Disease	Sanofi-Genzyme
Reena Kartha (PI), James C. Cloyd (Co-I)	Use of Antioxidant or Anti-inflammatory Medications to Mitigate Oxidative Stress and Inflammation in Type1 Gaucher Disease (GD1)	Pfizer, Inc.
Michael Kotlyar (Co-PI)	Cigarette Smoking as a Risk Factor for Greater Psychiatric Symptom Severity across Serious Mental Illnesses: A Secondary Analysis of Three Nationally-Representative NIH Data-sets	NIH National Institute on Drug Abuse

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
Michael Kotlyar (Co-I)	AI-DCL: Addressing Sociotechnical Challenges of Conversational Agents and Interventions in the Context of Elderly Care	The National Science Foundation
Ilo Leppik (PI), Angela Birnbaum (Co-I)	Nursing Home Survey Project for Epilepsy	UCB Pharma S.A.
Ling Li (Co-I)	Casual and Integrative Deep Learning for 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
Ling Li (PI)	Dysregulation of Protein Prenylation in the Pathogenesis of 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), Betsy Hirsch (Co-I)	Midwest Integration of the National HIV Curriculum (MINHC)	University of Illinois--Chicago
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)
Debra Skaar (Co-I)	Efficacy of Self-Management of Sedative Therapy by Ventilated ICU Patients	NIH National Heart, Lung, and Blood Institute

Robert Straka (Co-I)	The Long-Life Family Study (LLFS): Pharmacogenetics (PGx) Administrative Supplement	NIH National Institute on Aging
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
Mahmoud Al-Kofahi (Co-PI), Richard Brundage (Co-PI), Lisa Coles (Co-PI)	Drug-delivery Mechanism to Increase Adherence in Patients with Adrenal Insufficiency	Clinical and Translational Science Institute (CTSI), University of Minnesota
Mahmoud Al-Kofahi (Co-PI), Richard Brundage (Co-PI), Lisa Coles (Co-PI)	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
Angela Birnbaum (Co-I)	A feasibility study of topical cannabinoids for treatment of aromatase inhibitor-associated musculoskeletal syndrome (AIMSS) in women with hormone receptor-positive breast cancer (CanAroma)	Clinical Translational Research Services (CTRS) Pilot Funding Program, 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
Elizabeth Hirsch (Mentor)	Impact of a collaborative OPAT program at UMMC	University of Minnesota College of Pharmacy Melendy Research Scholarship
Elizabeth Hirsch (Co-I)	Program to Improve Quality and Safety of Outpatient Parenteral Antibiotic Treatment (OPAT) at UMMC	Medical School Academic Investment Clinical Program, University of Minnesota
Pamala Jacobson (PI), Jeffrey Bishop (Co-I)	Pharmacogenomics ECHO	University of Minnesota

Pamala Jacobson (PI), Jeffrey Bishop (Co-I), R. Stephanie Huang (Co-I)	Grand Challenge 3: Statewide Implementation of Pharmacogenomics	Provost's Office, University of Minnesota
Pamala Jacobson (PI)	Microbiome and Immunosuppressants in Hematopoietic Cell Transplantation	University of Minnesota Masonic Cancer Center Chainbreaker
Pamala Jacobson (Co-I), Debra Skaar (Co-I)	Creating a 21 st Century Precision Medicine Intensive Care Unit (ICU)	College of Pharmacy, University of Minnesota
Ling Li (PI)	Modeling and Reversing Alzheimer's Pathology via Human Brain Organoids	Faculty Research Development Grant Program, OACA, University of Minnesota
Debra Skaar (PI)	Efficacy of Self-management of Sedative Therapy by Ventilated ICU Patients	University of Minnesota
Robert J. Straka (PI)	Assessment of Anticoagulants and Antiplatelets Dosing Requirement in Hmong (A4) Study in Hmong	College of Pharmacy
Robert J. Straka (PI)	Microbiome Variation, Gout and Dietary Interactions within the Hmong "Hmong Microbiome And Gout, Obesity, Vitamin C (HMANGO-C) Study"	Minnesota Mayo Partnerships
Robert J. Straka (PI)	Very Important Pharmacogenes in Hmong (VIP-HC) Study (California Cohort)	College of Pharmacy, University of Minnesota
Robert J. Straka (PI)	Assessment of Anticoagulants and Antiplatelets Dosing Requirement in Hmong (A4) Study in Hmong	College of Pharmacy, University of Minnesota

PUBLICATIONS

JOURNAL ARTICLES BY ECP FACULTY

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

2022 Journal Articles

Abdelgawad, I. Y., Agostinucci, K., & Zordoky, B. N. (2022). Cardiovascular ramifications of therapy-induced endothelial cell senescence in cancer survivors. *Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease*, 1868(4), 166352. <http://dx.doi.org/10.1016/j.bbadis.2022.166352> 10.1016/j.bbadis.2022.166352

Abdelgawad, I. Y., Agostinucci, K., Ismail, S. G., **Grant, M. K., & Zordoky, B. N.** EA.hy926 Cells and HUVECs Share Similar Senescence Phenotypes but Respond Differently to the Senolytic Drug ABT-263. *Cells*, 11(13), 1992. <http://dx.doi.org/10.3390/cells11131992> 10.3390/cells11131992

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Agostinucci, K., Grant, M. K., Seelig, D., Yücel, D., van Berlo, J., Bartolomucci, A., . . . **Zordoky, B. N.** Divergent Cardiac Effects of Angiotensin II and Isoproterenol Following Juvenile Exposure to Doxorubicin. *Frontiers in Cardiovascular Medicine*, 9. <http://dx.doi.org/10.3389/fcvm.2022.742193> 10.3389/fcvm.2022.742193

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Takahashi, T., **Jaber, M. M.**, **Al-Kofahi, M.**, Weisdorf, D., Brunstein, C., Bachanova, V., **Brundage, R. C.**, **Jacobson, P. A.** . . . **Kirstein, M. N.** (2022). Comparison of Dose Adjustment Strategies for Obesity in High-dose Cyclophosphamide Among Adult Hematopoietic Cell Transplantation Recipients: Pharmacokinetic Analysis. *Transplantation and Cellular Therapy*, 28(12), 845.e1-845.e8. <http://dx.doi.org/10.1016/j.jtct.2022.09.011> 10.1016/j.jtct.2022.09.011

Takahashi, T., **Jaber, M. M.**, Smith, A. R., **Jacobson, P. A.**, **Fisher, J.**, & **Kirstein, M. N.** (2022). Predictive Value of C-Reactive Protein and Albumin for Temporal Within-Individual Pharmacokinetic Variability of Voriconazole in Pediatric Patients Undergoing Hematopoietic Cell Transplantation. *Journal of clinical pharmacology*, 62(7), 855-862. 10.1002/jcph.2024

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Terluk, M. R., Tieu, J., **Sahasrabudhe, S. A.**, Moser, A., Watkins, P. A., Raymond, G. V., & **Kartha, R. V.** (2022). Nervonic Acid Attenuates Accumulation of Very Long-Chain Fatty Acids and is a Potential Therapy for Adrenoleukodystrophy. *Neurotherapeutics*, 19(3), 1007-1017. <http://dx.doi.org/10.1007/s13311-022-01226-7> 10.1007/s13311-022-01226-7

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Van Hooser, J., Swanson, S., **Conway, J. M.**, & Brown, J. T. (2022). Assessing pharmacy students' baseline tolerance for ambiguity, burnout, empathy, quality of life, and stress. *Currents in pharmacy teaching & learning*, 14(8), 966-971. 10.1016/j.cptl.2022.07.008

Vuu, I., Patterson, E. E., Wu, C. Y., Zolkowska, D., **Leppik, I. E.**, Rogawski, M. A., ...**Cloyd, J. C.** & **Coles, L. D.** (2022). Intravenous and Intramuscular Allopregnanolone for Early Treatment of Status Epilepticus: Pharmacokinetics, Pharmacodynamics, and Safety in Dogs. *Journal of Pharmacology and Experimental Therapeutics*, 380(2), 104-113.

Wang, F., Namuju, O. C., Pastick, K. A., Abdusalaamu, K., **Mishra, U.**, **Collins, L.**, . . . **Nicol, M. R.** (2022). A post-mortem analysis of tenofovir, lamivudine, efavirenz and fluconazole penetration in female genital tissues. *The Journal of antimicrobial chemotherapy*, 77(11), 3180-3186. 10.1093/jac/dkac300

Wang, L., Curran, G. L., Min, P. H., **Li, L.**, Lowe, V. J., & Kandimalla, K. K. (2022). Amyloid Beta Peptides Inhibit Glucose Transport at the Blood-brain Barrier by Disrupting Insulin-Akt Pathway in Alzheimer's Disease. *bioRxiv*. <https://www.biorxiv.org/content/10.1101/2022.11.21.517280v1>

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Zhang, L., Lizano, P., Guo, B., Xu, Y., Rubin, L. H., Hill, S. K., . . . **Lee, A. M.**, **Bishop, J. R.** (2022). Inflammation subtypes in psychosis and their relationships with genetic risk for psychiatric and cardiometabolic disorders. *Brain, Behavior, & Immunity - Health*, 22, 100459. 10.1016/j.bbih.2022.100459

Zheng, D., Bergen, P. J., Landersdorfer, C. B., & **Hirsch, E. B.** (2022). Differences in Fosfomycin Resistance Mechanisms between *Pseudomonas aeruginosa* and Enterobacterales. *Antimicrobial agents and chemotherapy*, 66(2), e0144621. 10.1128/AAC.01446-21

OTHER PUBLICATIONS BY ECP FACULTY

2022 Other Publications by ECP Faculty

Bhushan, A., Garza, K. B., Perumal, O., Das, S. K., Feola, D. J., Farrell, D., & **Birnbaum, A.** (2022). Lessons Learned From the COVID-19 Pandemic and the Implications for Pharmaceutical Graduate Education and Research. *Handbook of Research on Updating and Innovating Health Professions Education: Post-Pandemic Perspectives* 324-345. Minneapolis: IGI Global. 10.4018/978-1-7998-7623-6.ch014

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

Conway, J. M., & **Birnbaum, A. K.** (2022). *Drugs for Epilepsy*. Lippincott's Illustrated Pharmacology.

Nair, C., Blaes, A. H., Everson-Rose, S., Jewett, P., Wolf, J., & **Zordoky, B.** Psychological measures of stress and associated biomarkers in breast cancer survivors on aromatase inhibitors. *Research Square Platform LLC*. <http://dx.doi.org/10.21203/rs.3.rs-1843882/v1> 10.21203/rs.3.rs-1843882/v1

Nicol, M. (2022). *Cutting-Edge Concepts in HIV Care- Pharmacists Perspective*.

Voinescu, E., & **Birnbaum, A. K.** (2023). *Drugs for Epilepsy*. Lippincott's Illustrated Reviews: Pharmacology. Wolters Kluwer Health.

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 2022, 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 21
- Undergraduate students mentored or advised by ECP faculty 17
- Graduate/Professional students mentored or advised by ECP faculty 64

Reported Student Credit Hours by Course Level

Course level	Credit hours	# of sections
1000	51	1
4000	70	2
5000	12	3
6000	2439	38
7000	6342	40
8000	79	23

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 2022, 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	142
Service commitments to the university, college, or department	22
External and public service commitments	28
Professional memberships	51
Professional development activities	9
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 40
- MS degrees completed 7
- ECP program graduates 5
- Students in ECP graduate program 25

ECP DOCTORAL GRADUATES

Name	Advisor	Thesis Title
Mu'taz Jaber, PhD	Richard Brundage, PharmD, PhD; Mahmoud Al-Kofahi, DDS, PhD	Evaluation of Pharmacostatistical Model Components Using a Nonlinear Mixed-effect Approach
Siddhee Sahasrabudhe, PhD	Reena Kartha, PhD; James Cloyd, PharmD	Application of Clinical Pharmacology in Rare Diseases and Non-suicidal Self-injury
Takuto Takahashi, PhD	Mark Kirstein, PharmD Mahmoud Al-Kofahi, DDS, PhD	Individualized Drug Use in Hematopoietic Cell Transplantation: Application of Pharmacometric and Pharmacogenomic Study
Ya-Feng (Jay) Wen, PhD	Robert Straka, PharmD	Toward Individualized Medicine in Understudied Populations using Personal Genome and Microbiome

ECP MASTERS GRADUATES

Name	Advisor	Project Title
Abdelrahman Saqr, MS	Pamala Jacobson, PharmD	Precision Medicine Approaches to Immunosuppression Using Pharmacogenomics and the Microbiome

FELLOWSHIPS AND AWARDS FOR GRADUATE STUDENTS

Name	Fellowships/Awards
Ibrahim Abdelgawad	University of Minnesota Doctoral Dissertation Fellowship, Bighley Fellowship, DR. BURHAN GHANAYEM Outstanding Graduate Research Award- Arab Toxicologists Association (ATA)
Morgan Bixby	Coin Fellowship, Hadsall-Uden Award for Pharmacy Advancement in 2022
Mohamed Dabour	People's Choice Poster Rho Chi Research Day 2022, CTSI APReP Summer Scholar
Yingbo Huang	ECP Fellowship, Teaching Assistant Class of 2024 for 2022 Fall Semester, First Place Poster Rho Chi Research Day 2022
Alyssa Lantz	First Place College of Pharmacy 3 Minute Thesis competition, CTSI TL1 pre-doctoral Scholar
Chenxu Li	Cloyd Fellowship, Runner Up College of Pharmacy 3 Minute Thesis competition, 2022 ALD Connect Emerging Investigator Award
Moataz Mohamed	ECP Fellowship, CTSI APReP Summer Scholar
Abdelrahman Saqr	Hadsall-Uden Award for Pharmacy Advancement in 2022, Honorable Mention College of Pharmacy 3 Minute Thesis competition
Boguang Sun	Straka Fellowship, 2022 Translational Research Development Program Award CTSI, UMN
Fan Wang	University of Minnesota Doctoral Dissertation Fellowship
Lusi Zhang	Hadsall-Uden Award for Pharmacy Advancement in 2022, AAPP Foundation Defining the Future Research Grant, University of Minnesota College of Pharmacy Outstanding Teaching Assistance (TA) May 2022, Award for the 2021-2022 academic year

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
Hyeong Joo Cho	R. Stephanie Huang
Yuqi Zhou	R. Stephanie Huang

PUBLICATIONS BY GRADUATE STUDENTS & POSTDOCS

2022 Journal Articles

Abdelgawad, I. Y., Agostinucci, K., & Zordoky, B. N. (2022). Cardiovascular ramifications of therapy-induced endothelial cell senescence in cancer survivors. *Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease*, 1868(4), 166352. <http://dx.doi.org/10.1016/j.bbadis.2022.166352>

Abdelgawad, I. Y., Agostinucci, K., Ismail, S. G., Grant, M. K., & Zordoky, B. N. EA.hy926 Cells and HUVECs Share Similar Senescence Phenotypes but Respond Differently to the Senolytic Drug ABT-263. *Cells*, 11(13), 1992. <http://dx.doi.org/10.3390/cells11131992>

Allen JD, Zhang L, Johnson ANK, Jacobson PA, McCarty CA, Pittenger AL, Bishop JR. (2022). Development and validation of the Minnesota Assessment of Pharmacogenomic Literacy (MAPL). *Journal of Personalized Medicine*, 12, 1398.

Avachat, C., Barry, J. M., Lyu, X., Sherwin, C. M., & Birnbaum, A. K. (2022). Management of Anti-Seizure Medications during Pregnancy: Advancements in The Past Decade. *Pharmaceutics*, 14(12). [10.3390/pharmaceutics14122733](https://doi.org/10.3390/pharmaceutics14122733)

Avachat, C., & Birnbaum, A. K. (2022). Women of childbearing age: What antiseizure medications are they taking?. *British Journal of Clinical Pharmacology*.

Bishop, J. R., Zhang, L., & Lizano, P. (2022). Inflammation Subtypes and Translating Inflammation-Related Genetic Findings in Schizophrenia and Related Psychoses: A Perspective on Pathways for Treatment Stratification and Novel Therapies. *Harvard Review of Psychiatry*, 30(1), 59-70. 10.1097/HRP.0000000000000321

Bixby, M. L., Raux, B. R., Bhalla, A., McCoy, C., & Hirsch, E. B. (2022). Opportunities for antibiotic stewardship in emergency department or hospitalized patients with asymptomatic bacteriuria: identifying risk factors for antibiotic treatment. *Antimicrobial stewardship & healthcare epidemiology : ASHE*, 2(1), e16. 10.1017/ash.2022.4

Fike, C. D., **Avachat, C., Birnbaum, A. K., Aschner, J. L., & Sherwin, C. M.** (2022). Pharmacokinetics of ICitrulline in Neonates at Risk of Developing Bronchopulmonary Dysplasia-Associated Pulmonary Hypertension. *Pediatric Drugs*, 1-10.

Grant, M. K., Razzoli, M., Abdelgawad, I. Y., Mansk, R., Seelig, D., Bartolomucci, A., & Zordoky, B. N. (2022). Juvenile exposure to doxorubicin alters the cardiovascular response to adult-onset psychosocial stress in mice. *Stress*, 25(1), 291-304. <http://dx.doi.org/10.1080/10253890.2022.2104121> 10.1080/10253890.2022.2104121

Huang, Y., Cho, H. J., Stranger, B. E., & Huang, R. S. (2022). Sex dimorphism in response to targeted therapy and immunotherapy in non-small cell lung cancer patients: a narrative review. *Translational lung cancer research*, 11(5), 920-934. 10.21037/tlcr-21-1013

Jeong*, A., Auger*, S. A., Maity, S., Fredriksen, K., **Zhong, R., Li, L., & Distefano, M. D.** (2022). In Vivo Prenylomic Profiling in the Brain of a Transgenic Mouse Model of Alzheimer's Disease Reveals Increased Prenylation of a Key Set of Proteins. *ACS chemical biology*, 17(10), 2863-2876. 10.1021/acscchembio.2c00486

Lantz, A. M., & Nicol, M. R. (2022). Translational Models to Predict Target Concentrations for Pre-Exposure Prophylaxis in Women. *AIDS research and human retroviruses*, 38(12), 909-923. 10.1089/AID.2022.0057

Pakiding Y, **Sriwijaya J.** Medical students' perceptions of virtual learning during the COVID pandemic [Internet]. *Jurnal Pendidikan Kedokteran Indonesia: The Indonesian Journal of Medical Education* Vol 11, No 4. 2022, <https://jurnal.ugm.ac.id/jpki/article/view/72119>

Qu, W., Jeong, A., **Zhong, R., Thieschafer, J. S., Gram, A., & Li, L.** (2023). Deletion of Small GTPase H-Ras Rescues Memory Deficits and Reduces Amyloid Plaque-Associated Dendritic Spine Loss in Transgenic Alzheimer's Mice. *Molecular neurobiology*, 60(2), 495-511. 10.1007/s12035-022-03082-0

Sahasrabudhe, S. A., Cheng, S., Al-Kofahi, M., Jarnes, J. R., Weinreb, N. J., & Kartha, R. V. (2022). Physiologically-Based Pharmacokinetic Model Development, Validation, and Application for Prediction of Eliglustat. *Clinical Pharmacology & Therapeutics*, 112(6), 1254-1263. <http://dx.doi.org/10.1002/cpt.2738> 10.1002/cpt.2738

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Saqr, A., Carlson, B., Staley, C., Rashidi, A., Al-Kofahi, M., Kaiser, T., . . . Jacobson, P. A. (2022). Reduced Enterohepatic Recirculation of Mycophenolate and Lower Blood Concentrations Are Associated with the Stool Bacterial Microbiome after Hematopoietic Cell Transplantation. *Transplantation and Cellular Therapy*, 28(7), 372.e1-372.e9. <http://dx.doi.org/10.1016/j.jtct.2022.04.018> 10.1016/j.jtct.2022.04.018

Sherwin, C. M., Tran, N. K., Sullivan, K., Wead, S., **Birnbaum, A. K., Avachat, C., . . . Healy, D. P.** (2022). 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*. 10.1093/jbcr/irac147

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- Sun, B., Yew, P. Y., Wen, Y.-F., Chi, C.-L., & Straka, R. J. (2022). Comparison of the Warfarin Dosing and Outcomes in Hmong Versus East Asians Patients: Real-World Data From an Integrated Healthcare System. *Cureus*, 14(9).
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Zhang, L., Lizano, P., Guo, B., Xu, Y., Rubin, L. H., Hill, S. K., . . . Lee, A. M., Bishop, J. R. (2022). Inflammation subtypes in psychosis and their relationships with genetic risk for psychiatric and cardiometabolic disorders. *Brain, Behavior, & Immunity - Health*, 22, 100459. 10.1016/j.bbih.2022.100459

PRESENTATIONS BY GRADUATE STUDENTS & POSTDOCS

2022 Abstracts, Posters, and Presentations

Abdelgawad IY*, Grant MKO, Agostinucci K, Ismail SG, and Zordoky BN. HUVECs and EA.hy926 Cells Share Similar Senescence Phenotype but Respond Differently to the Senolytic Drug ABT-263. Presented in Society of Toxicology annual meeting in San Diego March 2022

Abdelgawad IY, Suleiman AA, Chyla B, Ghanim M, Salem AH, and Badawi M. Early blood uMRD correlates with improved PFS in patients with CLL. Presented in American Association of Cancer Research (AACR) annual meeting in New Orleans April 2022

Agostinucci K, Grant MKO, Abdelgawad IY*, and Zordoky BN. Exposure to Doxorubicin Modulates the Cardiac Response to Isoproterenol in a Sex-Dependent Manner. Presented in Experimental Biology annual meeting in Philadelphia April 2022

Allen JD, Zhang L, Johnson ANK, Jacobson PA, McCarty CA, Pittenger AL, Bishop JR. Development and validation of the Minnesota Assessment of Pharmacogenomic Literacy (MAPL). Presented at the 2022 Clinical Pharmacogenetics Implementation Consortium-Pharmacogenomics Global Research Network (CPIC-PGRN) meeting, Aurora, CO, USA (5/10/2022). Poster/Abstract

Avachat, C. "Comparison of Antiseizure Medication Concentrations Measured Within and Outside a Central Laboratory". American Epilepsy Society annual meeting, Nashville, Tennessee, December 2022

Avachat, C. "Maternal Symptomatic Toxicity and Oxcarbazepine Free Fraction during Pregnancy in Women with Epilepsy". American Academy of Neurology annual meeting, April 2022

Barajas, C. "N-methyl-D-aspartate receptor antagonist agmatine prevents oxycodone self-administration", American Society for Pharmacology and Experimental Therapeutics Poster Presenter, Philadelphia, PA, April 2022.

Barajas, C. "Novel Antihyperalgesic Agents, Strategically Substituted Agmatines, Effectively Reduce Hypersensitivity". Society for Neuroscience, San Diego, CA, November 2022

Barajas, C. "System pre-treatment of the N-methyl-D-aspartate Receptor Antagonist Agmatine Reduces Oxycodone Self-Administration in mice". International Association for the Study of Pain World Congress on Pain, Toronto, Ontario, Canada, September 2022.

Bixby ML, Salay JM, Hirsch EB. Comparison of inner colony production among *Escherichia coli* (EC) and *Klebsiella pneumoniae* (KP) during fosfomycin disk diffusion (DD) testing. Poster presentation, IDWeek 2022, October 2022.

Dabour SM, Abdelgawad IY*, Grant MKO, and Zordoky BN. The Protective Effect Of Canagliflozin Against Carfilzomib-induced Endothelial Toxicity. Presented in Basic Cardiovascular Sciences (BCVS) annual meeting in Chicago July 2022.

Huang, Yingbo, Yuting Shan, Weijie Zhang, Adam M. Lee, Feng Li, Barbara E. Stranger, R. Stephanie Huang. Sex differences in the genetic effect of drug metabolizing enzymes and transporter genes. PGRN-CPIC Annual Conference, 2022, Denver, CO

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Lantz A, Nakalega R, Kabwigu S, Isingel E, Staley C, Sykes C, Kiweewa Matovu F, Nicol MR. Relationship between host factors and antiretroviral genital concentrations in women. International Workshop on HIV and Women 2022. Virtual. 6-8 April 2022. Poster #50

Lantz A, Staley C, Nicol MR. Identifying vaginal microbiome profiles that influence tenofovir distribution in the female genital tract. Midwest TL1 Research Summit. University of Madison-Wisconsin. 30 – 31 September 2022.

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Zhang, L, “Statewide Implementation of Pharmacogenomics: Community Stakeholders’ Perspectives and Knowledge in the State of Minnesota”, Presented at the 2022 American College of Clinical Pharmacy (ACCP) Global Conference Pharmacokinetics/Pharmacodynamics/Pharmacogenomics (PK/PD/PG) PRN Business Meeting. San Francisco, CA (10/17/2022).

Zhang L, Lizano P, Xu Y, Rubin LH, Lee AM, Lencer R, Reilly JL, Keefe RSE, Keedy SK, Pearlson GD, Clementz BA, Keshavan MS, Gershon ES, Tamminga CA, Sweeney JA, Hill SK, Bishop JR. Peripheral inflammation is associated with impairments of inhibitory behavioral control and visual sensorimotor function in psychotic disorders. Presented at 2022 American College of Neuropsychopharmacology (ACNP) Annual Meeting, Phoenix, AZ, USA (12/6/2022). Poster/Abstract

Zhang L, Johnson ANK, Jacobson PA, McCarty CA, Bishop JR. Public attitudes toward pharmacogenomic testing and establishing a statewide pharmacogenomic data shelter in Minnesota. 2022 American College of Clinical Pharmacy (ACCP) Global Conference, San Francisco, CA, USA (10/15/2022). Poster/Abstract.

Rui Zhong, Yingzheng Xu, Andrea Gram, Jesse Williams, Ling Li. “TREM2 modulates amyloid distribution between parenchyma and vasculature in the brain of a mouse model of Alzheimer’s disease and cerebral amyloid angiopathy”. Nov 16, 2022. Neuroscience 2023. San Diego, CA

Rui Zhong, Andrea Gram, Ling Li. “TREM2 Differentially Modulates Parenchymal and Vascular Pathology in a Mouse Model of Cerebral Amyloid Angiopathy”. Aug 1, 2022. Alzheimer’s Association International Conference 2022. San Diego, CA

ECP RESEARCH SEMINAR (ECP 8100)

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

Date - Spring 2022	Title	Presenter
January 26	Pharmacokinetics and Physiological Changes during Pregnancy	Yuhan Long , PhD student, ECP
February 2	Epilepsy and Pregnancy Registries: Its Benefits and Limitations	Jason Sriwijaya , PhD student, ECP
February 9	How Medical Cannabis is being Dispensed in the Minnesota State Medical Cannabis Program (Preliminary data)	Xintian Lyu , PhD student, ECP
February 16	Development of a physiologically-based pharmacokinetic model to evaluate pharmacokinetic changes of lacosamide during pregnancy	Jessica Barry , PhD student, ECP
February 23	Building a Global Company to Improve Lives through Innovative Preclinical Science - A focus on Infectious Diseases	Marnie Peterson , PharmD, PhD, Chief Scientific Officer and US Managing Director, Perfectus Biomed Group, Jackson, WY
March 2	Prevention of Opioid Self-Administration by Agmatine	Cecelia Barajas , PhD student, ECP
March 16	Sex Differences in Drug Metabolism Enzymes and Transporters (DMET) Gene Expression and Their Metabolizing Activity	Yuting Shan , PhD student, ECP
March 23	Sodium Selenate: A Potential Therapy for Epilepsy	Chenxu Li , PhD student, ECP
March 30	Artificial Intelligence with Multimodal Data Sources in Pharmaceutical Sciences	Rui Zhang , PhD, Associate Professor and McKnight Presidential Fellow, PCHS and Core Faculty, Institute for Health Informatics
April 6	The potential role of SGLT2 inhibitors in CardioOncology	Mohamed Dabour , PhD student, ECP
April 13	Assessment of warfarin management and outcomes in Minnesota Hmong versus East Asians within an integrated Healthcare System	Boguang Sun , PhD student, ECP
April 20	Race and Tacrolimus Pharmacogenomics	Moataz Mohamed , PhD student, ECP

April 27	Using quantitative pharmacology to improve clinical outcomes in pediatric hematopoietic cell transplantation	Janel R. Long-Boyle , PharmD, PhD, Professor, Departments of Clinical Pharmacy and Division of Pediatric Allergy/Immunology/Bone Marrow Transplantation; University of California San Francisco, Mission Bay
Date - Fall 2022	Title	Presenter
September 21	ECP Lab Safety Training Seminar	Rebecca Cuellar , PhD, College Safety Officer Jodi Oglvie , PhD & Nancy Rolsted , MS, RBP, DEHS Co-Presenters
September 28	Accelerating Drug Development in Oncology: How Can Clinical Pharmacology Help?	Ahmed Hamed Salem , PhD, FCP, Director, Clinical Pharmacology & Pharmacometrics, AbbVie, Inc., Adjunct Professor ECP
October 5	Reduced Enterohepatic Recirculation of Mycophenolate and Lower Blood Concentrations Are Associated with the Stool Bacterial Microbiome after Hematopoietic Cell Transplantation	Abdelrahman Saqr , ECP PhD student
October 12	Revisiting Antiseizure Medications as Controlled Substances in the United States and their Impact on Clinical Practice	Jason Sriwijaya , MD, ECP PhD student
October 19	Pediatric Obesity: Definitions, Management, and Pharmacotherapy Considerations	Eric Bomberg , MD, MS, Associate Director for Research Informatics, Center for Pediatric Obesity Management
October 26	Role of KATP channel signaling during opioid and cannabinoid analgesia and drug seeking behaviors	Amanda Klein , MS, PhD, Assistant Professor, PPPS
November 9	Statewide implementation of pharmacogenomics: community stakeholders' perspectives and knowledge in the state of Minnesota	Lusi Zhang , PharmD, ECP PhD student
November 16	ECP Inaugural Toxicology Seminar Sponsored by the Speedie-SafetyCall Endowment Fund	Larry Walker , PhD, Interim Director of the National Center for Cannabis Research and Education
November 30	Evaluation of Recorded Time Deviations on Parameter Estimates in Nonlinear Mixed-effects Modeling	Mutaz Jabar , PharmD, ECP PhD student
December 7	Class Presentations on Current and Future Research Directions	Student Sharing and Discussion
December 14	DEI Discussion on Bullying and Authorship	Reena Kartha , MS, PhD, Research Assistant Professor and Susan Marino , PhD, Associate Professor, ECP, Discussion Leads