

curriculum vitae of
Jacob K. McPherson
PHARM.D. · PH.D.(C)

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STATEMENT OF PURPOSE

The successful treatment and prevention of infectious diseases not only improves the lives of patients today, but also those of populations tomorrow. However, the antimicrobials we use *today* to treat patients with infectious diseases can also select for *tomorrow's* microbial descendants not as easily thwarted as their predecessors. This phenomenon, also known as antimicrobial resistance or AMR, is a top threat to modern medicine and society. To address this top-level threat, extraordinary research in the pharmacy practice and pharmacology of antimicrobials in the treatment of antimicrobial resistant infectious diseases is urgently needed. To address these challenges, I synthesize data from both classical and advanced approaches to *better* approach and understand AMR.

Scientific Interests

1. The application of **Artificial intelligence** for antimicrobial pharmacology and drug development
2. The human **microbiome**, **AMR** and live biotherapeutic products (**LBP**) development
3. The **structure**, **function** and pharmacology of bacterial DNA/RNA **polymerases**

EDUCATION

2021 – 2025	Doctor of Philosophy, Pharmacology GPA: 4.000, <i>Summa Cum Laude</i> ; Thesis: <i>The Structure, Function and Pharmacology of the PolC-type DNA polymerase III</i>	UNIVERSITY OF HOUSTON
2017 – 2021	Doctor of Pharmacy GPA: 3.139, Texas State Board of Pharmacy, Registered Pharmacist (RPh), License No. 71540, <i>active</i>	UNIVERSITY OF HOUSTON
2011 – 2015	Bachelor of Science, Cellular and Molecular Biology GPA: 3.194; 2014 award for essay, <i>Cancer Immunotherapy</i> , with Dr. Bob G. Sanders, Ph.D.	UNIVERSITY OF TEXAS AT AUSTIN

PRIOR WORK EXPERIENCE

2023 – 2025	Postdoctoral Fellow NIH T32AI179595-01/T32AI141349-05 <ol style="list-style-type: none">1. Conducted independent research on the PolC-type DNA Polymerase III of the <i>Bacillota</i> replisome, designing and executing experiments, analyzing data, and contributing to publications2. Authored peer-reviewed publications, grant proposals, and presented findings at local and national conferences3. Mentored and trained graduate and undergraduate researchers, fostering their professional development and supporting collaborative research efforts.	UNIVERSITY OF HOUSTON
2022 – 2023	Graduate Research Assistant The Garey Lab, Department of Pharmacy Practice and Translational Research <ol style="list-style-type: none">1. Conducted in-depth literature reviews and synthesized findings to support research projects on antibiotic-associated microbiome disruption, ensuring comprehensive and up-to-date information2. Performed data collection, analysis, and visualization, utilizing tools such as R/python, to uncover trends;3. Drafted manuscripts, abstracts, and conference presentations contributing to lab publications	UNIVERSITY OF HOUSTON
2021 – 2022	Graduate Teaching Assistant Department of Pharmacological and Pharmaceutical Sciences <ol style="list-style-type: none">1. Recorded attendance for Pharm.D. professional degree program;2. Graded Pharm.D. student assignments and projects, offering constructive feedback to enhance understanding;3. Fall TA for P3 PharmD Infectious Diseases learning Modules, under supervision of Dr. Dr. Amelia Sofjan, PharmD, and Dr. Alexa Zhao, PharmD.4. Spring TA for Pr PharmD Physiology II Learning Modules, under supervision of Dr. Aditi Marwaha, PhD5. Aided in the Objective Structured Clinical Examinations (OSCEs), coordinating logistics and ensuring a fair and effective assessment environment.	UNIVERSITY OF HOUSTON

2017 – 2021

Student Pharmacist

UNIVERSITY OF HOUSTON

Doctor of Pharmacy Professional Degree Program

1. Participated in student professional society community health fairs for the under-served communities of Houston;
2. In 2017, aided the Northeast Houston communities most devastated by the Lake Conroe dam buildup and torrential flooding as a result of Hurricane Harvey;
3. In 2021, checked vaccines for safety during the 2021 vaccination campaigns organized by Houston Methodist during the vaccine rollout of the COVID-19 pandemic.

2015 – 2020

Research Technician

UNIVERSITY OF HOUSTON

The Garey Lab, Department of Pharmacy Practice and Translational Research

1. Documented patient samples for infectious diseases isolation;
2. Performed strain typing on isolates for outbreak analysis;
3. Characterized isolate susceptibility to antibiotics for longitudinal trends.

RESEARCH AND SCHOLARLY ACTIVITIES

 Author: [Link/JacobKMcPherson](#)


INVITED PRESENTATIONS

- [1] Jacob K. McPherson. *The Basis of Commensal Bacillota Resistance to a Novel PolC-type DNA Polymerase III Inhibitor, Ibezapolstat, and the "Narrower" Spectrum of Activity Towards C. difficile*. Invited oral presentation at the Texas Medical Center Antimicrobial Resistance Conference. Houston, TX. Jan. 2024.
- [2] Jacob K. McPherson. *In Silico Prediction of the Structural Basis of Commensal Bacillota Non-susceptibility to the PolC-type DNA Polymerase III Inhibitor, Ibezapolstat*. Invited oral presentation at the 33rd Annual Keck Research Conference. Houston, TX. Oct. 2023.

JOURNAL PUBLICATIONS

- [1] Kevin W Garey et al. "Efficacy, safety, pharmacokinetics, and microbiome changes of ibezapolstat in adults with *Clostridioides difficile* infection: a phase 2a multicenter clinical trial". In: *Clinical Infectious Diseases* 75:7 (2022), pp. 1164–1170.
- [2] Jinhee Jo et al. "Multi-country surveillance of *Clostridioides difficile* demonstrates high prevalence of spores in non-healthcare environmental settings". In: *Anaerobe* 75 (2022), p. 102543.
- [3] Jacob McPherson et al. "Functional and metagenomic evaluation of ibezapolstat for early evaluation of anti-recurrence effects in *Clostridioides difficile* infection". In: *Antimicrobial Agents and Chemotherapy* 66.8 (2022), e02244–21.
- [4] M Jahangir Alam et al. "Molecular epidemiology of *Clostridioides difficile* in domestic dogs and zoo animals". In: *Anaerobe* 59 (2019), pp. 107–111.
- [5] Bradley T Endres et al. "Environmental transmission of *Clostridioides difficile* ribotype 027 at a long-term care facility; an outbreak investigation guided by whole genome sequencing". In: *Infection Control & Hospital Epidemiology* 39.11 (2018), pp. 1322–1329.

CONFERENCE PAPERS

- [1] Chris Lancaster et al. "2063. Elucidating the Gram-Positive Selective Spectrum Activity of Ibezapolstat; Secondary Analysis from the phase 2a trial". In: *Open Forum Infectious Diseases*. Vol. 10. Supplement_2. Oxford University Press US. 2023, ofad500–133.
- [2] Jinhee Jo et al. "620. Pharmacokinetic-Pharmacodynamic Analysis of Oral Vancomycin and Gut Microbiome Changes in Healthy Volunteers: an Exploratory Study". In: *Open Forum Infectious Diseases*. Vol. 9. Supplement_2. Oxford University Press US. 2022, ofac492–672.
- [3] M Jahangir Alam et al. "1720. Isolation and Characterization of *Candida auris* From an Active Surveillance System in Texas." In: *Open Forum Infectious Diseases*. Vol. 6. 2019.
- [4] Khurshida Begum et al. "2410. Molecular Characteristics of Environmental *Clostridioides difficile* From a Large Texas Hospital". In: *Open Forum Infectious Diseases*. Vol. 6. Suppl 2. Oxford University Press. 2019, S832.

- [5] Kierra M Dotson et al. "2391. Increased Risk of Systemic Infections with Multidrug-Resistant Organisms in Patients with Severe *Clostridioides difficile* Infection." In: *Open Forum Infectious Diseases*. Vol. 6. 2019.
- [6] M Jahangir Alam et al. "First Environmental Investigation of Toxigenic *Clostridium difficile* at a Large Hospital in Bangladesh". In: *Open Forum Infectious Diseases*. Vol. 4. Suppl 1. Oxford University Press. 2017, S406.
- [7] M Jahangir Alam et al. "Prevalence and Ribotype Diversity of Toxigenic *Clostridium difficile* in Animals". In: *American Society for Microbiology - Texas Branch Annual Meeting*. 2016.
- [8] M Jahangir Alam et al. "Ribotype Diversity of *Clostridium Difficile* Strains from Diverse Environmental Sources and Geographical Areas". In: *American Society for Microbiology - Texas Branch Annual Meeting*. 2016.

HONORS AND AWARDS

2024 – 2025	AMR Training Program in the Texas Medical Center (AMR-TPT) ¹	GULF COAST CONSORTIA
2023 – 2024	Training Program in AMR (TPAMR) ²	GULF COAST CONSORTIA
2022	Artificial Intelligence in Predictive Structural Biology, Best Overall	RICE UNIVERSITY
2021	Maktoob Alam Endowment Scholarship Recipient	UNIVERSITY OF HOUSTON
2017	Finalist, Graduate School Talk	UNIVERSITY OF HOUSTON
2014	Honors College Award for Essay in Immunological Sciences	UNIVERSITY OF TEXAS AT AUSTIN

PROFESSIONAL SOCIETIES

2024 – present	National Postdoctoral Association (NPA)	MEMBER 78313934
2021 – present	American Association for the Advancement of Science (AAAS)	MEMBER 60232856
2020 – present	Infectious Diseases Society of America (IDSA)	MEMBER M-007438960232856
2019 – present	American Society for Microbiology (ASM)	MEMBER 200109389
2019 – present	American Society for Pharmacology and Experimental Therapeutics (ASPET)	MEMBER 35728
2017 – present	American Pharmacists Association (APhA)	MEMBER 774382
2017 – present	American Society of Health-System Pharmacists (ASHP)	MEMBER 07583064
2017 – present	American College of Clinical Pharmacy (ACCP)	MEMBER 2083979
2017 – present	Phi Delta Chi (PDC), Alpha Tau Chapter	MEMBER 406236

EXTRACURRICULAR ACTIVITIES

2023 – present	Antimicrobial Resistance (AMR) Scholars Academic Steering Committee	GULF COAST CONSORTIA
2023 – present	Accreditation Council for Pharmacy Education (ACPE) Standards 2024 Administrative Sub-Committee, Standard 21	UNIVERSITY OF HOUSTON
2023 – 2025	Clinical and Translational Research Symposium (CTRS) Organizing Committee	UNIVERSITY OF HOUSTON
2022 – 2023	Cell and Molecular Biophysics (CMB) Scholars Academic Steering Committee	GULF COAST CONSORTIA
2015 – 2018	Volunteer, Weekly Thursday night coffee and tea provision to patients and family members provide a safe and welcoming environment; supervisor: Andrea Warren	THE UNIVERSITY OF TEXAS M.D. ANDERSON CANCER CENTER

COMMUNITY SERVICE

2017 – 2018	Hurricane Harvey Aftermath Cleanup Removal of numerous homes' drywall, furniture, and flooding mud	PHI DELTA CHI
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¹NIAID T32AI179595-01

²NIAID T32AI141349-05

2018 – 2019	Healthcare for the Homeless	HARRIS HEALTH SYSTEM
	Student pharmacist provision of drug services to people experiencing unstable housing in a Federally Qualified Health Center (FQHC)	

MENTORSHIP ACTIVITIES

2024 - present	TTUHSC ³ COP c/o '26 Pharmacy Student	PHARM D
	1. Alternative pathways in industry and the pharmacy profession overall	
2023 - present	UHCOP PPS Dept. '23 Graduate Student	PhD
	1. International student excited to learn!	
2023 - present	UTCOP ⁴ c/o '27 Pharmacy Student	PHARM D
	1. Mentored during their undergraduate at UT Austin	
	2. 2023 matriculation into the UTCOP PharmD program	
2023 - present	UHCOP ⁵ c/o '28 PharmD Student	PHARM D
	1. First met as an undergraduate pre-pharmacy	
	2. Matriculated 2024 as UHCOP PharmD student	
2023 - present	UT Undergrad Student	PRE-GRADUATE SCHOOL
	1. Plans to apply to Penn Graduate Program	
2022 - present	UHCOP PharmD c/o '22 Graduate Student	PHARM D/PhD
	1. Entered PhD with Dept. of Pharmacological and Pharmaceutical Sciences (PPS)	
2022 - present	UHCOP PharmD c/o '22 Graduate Student	PHARM D/PhD
	1. Entered PhD with Dept. of Pharmaceutical Health Outcomes and Policy (PHOP)	

STUDENT PHARMACIST EXPERIENCES

Mar. 2021	Ambulatory APPE⁶	APPE 7
	Site: Houston Methodist West Hospital, Katy, TX, USA	
	Preceptor: Clement Chung, Pharm.D.	
	1. Observed and independently educated patients receiving new and ongoing outpatient treatment for oncologic- and hematologic disease states.	
	2. Ensured the most up-to-date clinical trial findings in oncology were applied to the ambulatory patients receiving oncologic care.	
	3. Journal Club: 'Abemaciclib Combined With Endocrine Therapy for the Adjuvant Treatment of HR+, HER2-, Node-Positive, High-Risk, Early Breast Cancer (monarchE)'. J Clin Oncol. 2020;38(34):3987-3998. doi:10.1200/JCO.20.02514.	
	4. Patient Presentation: 'A Case of Transplant Ineligible Multiple Myeloma'.	
	5. Produced a BioRender model for preceptor's publication, acknowledged in "Targeting the Myeloid Lineages and the Immune Microenvironment in Myelodysplastic Syndromes: Novel and Evolving Therapeutic Strategies." Annals of Pharmacotherapy 56.4 (2022): 475-487. https://doi.org/10.1177/10600280211036154.	
Feb. 2021	Internal Medicine APPE	APPE 6
	Site: Houston Methodist The Woodlands Hospital, The Woodlands, TX, USA	
	Preceptor: Ha Nguyen, R.Ph.	
	1. Assisted pharmacy-based management of inpatient anticoagulant, cardiovascular disease states, infectious diseases, and antimicrobial stewardship.	
	2. Performed discharge counseling for improved medication adherence and outcomes.	
	3. Journal Club: 'Once-Weekly Semaglutide in Adults with Overweight or Obesity.' N Engl J Med. February 2021. DOI: 10.1056/NEJMoa2032183.	
	4. Patient Presentation: 'Antibody Mediated Rejection after Kidney Transplantation'	

³TTUHSC = Texas Tech University Health Science Center

⁴UTCOP = University of Texas College of Pharmacy

⁵UHCOP = University of Houston College of Pharmacy

⁶APPE = Advanced Pharmacy Practice Experience

Jan. 2021	Regulatory Affairs Site: The U.S. Food and Drug Administration, Silver Springs, MD, USA Preceptor: Anand Balakrishnan, Ph.D. <ol style="list-style-type: none"> 1. Exposure to the public-domain of best practices and resources guidance documentation for industry sponsors seeking FDA regulatory approval of drugs. 2. Assisted the regulatory and ethical abstraction of adult data on approved monoclonal antibodies for the treatment of rheumatic diseases in pediatric populations 3. Presented educational experience to the UHCOP Office of Experiential Programs faculty 	APPE 5
Nov. 2020	Oncology APPE Site: The University of Texas M.D. Anderson Cancer Center, Houston, TX, USA Preceptor: Laura Whited, Pharm.D. <ol style="list-style-type: none"> 1. Delivered patient-specific recommend pharmacotherapy interventions in patients pre-, mid- and post-HSCT, including pain-, side effect-, fluid-, and antimicrobial-management. 2. Engaged in afternoon topic discussions with preceptors, residents and fellow P4 students. 3. Journal Club: 'Efficacy and safety of multiple doses of NEPA without dexamethasone in preventing nausea and vomiting induced by multiple-day and high-dose chemotherapy in patients with non-Hodgkin's lymphoma undergoing autologous hematopoietic stem cell transplantation: a phase IIa, multicenter study'. Bone Marrow Transplant. 2020;55(11):2114-2120. 	APPE 4
Sep. 2020	Antimicrobial Stewardship APPE Site: Baylor Saint Luke's Episcopal Hospital, Houston, TX, USA Preceptor: Vincent Tam, Pharm.D. <ol style="list-style-type: none"> 1. Delivered evidence-based inpatient-specific antibiotic stewardship intervention recommendations at the Baylor St. Luke's Medical Center (BSLMC). 2. Journal Club: 'The CODA Collaborative. A Randomized Trial Comparing Antibiotics with Appendectomy for Appendicitis.' N Engl J Med. October 2020. https://doi:10.1056/nejmoa2014320 3. Patient Presentation: 'Partial Oral Antibiotics for Infective Endocarditis' 	APPE 3
Aug. 2020	Hospital APPE Site: Ben Taub General Hospital, Houston, TX, USA Preceptor: Prakash Varkey, R.Ph. <ol style="list-style-type: none"> 1. Assisted hospital central pharmacy operations, including but not limited to pharmacist verification of oncology products, intravenous products, and Pharmacist-in-charge duties. 2. Accelerated the Harris Health System Fall Prevention Pharmacist Consult Form, the Ben Taub 8-point Check, and the HHS Succinct Vancomycin Dosing Consult Pocketbook. 3. Journal Club: 'Phase 1-2 Trial of a SARS-CoV-2 Recombinant Spike Protein Nanoparticle Vaccine' [published online ahead of print, 2020 Sep 2] N Engl J Med. 2020;10.1056/NEJMoa2026920. 	APPE 2
Jul. 2020	Community APPE Site: Kroger Pharmacy No. 190, Houston, TX, USA Preceptor: Sarah Fochtman, Pharm.D. <ol style="list-style-type: none"> 1. Assisted in pharmacy technician duties including but not limited to new medication order intake, processing, and calling prescribers regarding prescription questions. 2. Observed and directly performed community pharmacist duties including counseling patients on new medications, completing prescription transfer requests, and vaccinations. 	APPE 1
Jan. 2020	Institutional IPPE⁷ Site: Houston Methodist Baytown Hospital, Baytown, TX, USA Preceptor: Andrew Mulder, Pharm.D. <ol style="list-style-type: none"> 1. Participated in rounds with infectious diseases physician and inpatient clinical pharmacy specialist preceptors. 2. Performed discharge counseling for improved medication adherence and outcomes. 3. Presentation on the genetic etiology and pathophysiology of Hemophagocytic lymphohistiocytosis (HLH) for a unique case. 	IPPE 3
Jul. 2019	Community IPPE Site: Kroger Pharmacy No. 334, Missouri City, TX, USA Preceptor: Hattie Davis, R.Ph. <ol style="list-style-type: none"> 1. Learned and performed the duties of a pharmacy technician including new prescription reception, data entry, counting, adjudications, prescriber refill request, shelf maintenance, and inventory management. 2. Learned and performed the duties of a pharmacist including calls to prescriber offices, pharmacy transfers, insurance adjudications, and patient interventions. 	IPPE 2

⁷IPPE = Introductory Pharmacy Practice Experience

Sep. 2018

Community IPPE

IPPE 1

Site: Outpatient Pharmacy, Lyndon B. Johnson (LBJ) General Hospital, Houston, TX, USA

Preceptor: Donna Simmons, R.Ph.

- i. Learned the foundational roles of a pharmacy technician in a fast-paced outpatient pharmacy serving a predominantly underserved patient population in an East Houston Hospital.