2023

FACULTY

RESEARCH

PROFILES

ALBANY COLLEGE OF PHARMACY
AND HEALTH SCIENCES

The faculty at the Albany College of Pharmacy and Health Sciences is a distinguished group of scholars with research interests in the clinical, biomedical, pharmaceutical, and social sciences. Faculty across all academic departments are engaged in research focused on untangling the complex mechanisms of disease, diagnosing, and characterizing disease markers, identifying new and effective drug therapies, and understanding the clinical challenges associated with delivering the most effective healthcare to diverse patient populations.

Many of our faculty explore research questions that are supported by federal granting agencies such as the National Institute of Health (NIH), and by pharmaceutical and biotechnology companies and private foundations. Their work is regularly reported at prominent national and international conferences and is published in influential peer-reviewed journals. Collaboration among faculty within ACPHS as well as with external scientists and clinicians provide a network of opportunity and resources that enhance the research environment at the College. Research facilities and resources on our New York campus and around the Capital Region area are available and accessible, and further enrich the research productivity and experience for both students and their faculty mentors. Faculty work closely with student collaborators, providing hands-on, one-on-one interactions that result in deepening the students' research training. Our over 30 research faculty are thoroughly committed to training the next generation of scientific, clinical, and administrative professionals to become leaders in pharmaceutical and biotechnology companies, healthcare Institutions, government, and academia.

This catalog represents a listing of our research faculty with summaries of their research interests and contact information. Feel free to contact faculty with questions you may have about research. We believe student researchers are an integral part of the research community and educational experience at ACPHS.

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ALLISON BURTON-CHASE. PhD.

Associate Professor, Chair
Behavioral Medicine
HAB 104B
Tel: 518-694-7362
Allison.burton-chase@acphs.edu

My primary area of research is the behavioral aspects of cancer prevention and survivorship in families with hereditary cancer syndromes. Specifically, I am interested in developing interventions to improve health behaviors in this population, with a focus on improving patient-provider communication. Recent projects include assessing advanced care planning in individuals with Lynch syndrome, examining screening behaviors and patient-provider communication regarding gynecologic cancer risk for women with Lynch syndrome, and determining factors that lead individuals with Lynch syndrome to terminate their provider relationships.

DAVID A. BUTLER, PHARM D, BCPS, AAHIVP

Assistant Professor
Department of Pharmacy Practice
OB 212J
Tel: 518-694-7144
david.butler@acphs.edu

Dr. Butler's research interests are varied and include topics such as multi-drug resistant Gram-negative bacteria, antimicrobial pharmacokinetics/ pharmacodynamics, epidemiology and outcomes research through healthcare databases, as well as novel approaches to translational, clinical, and patient-centered outcomes research.

KATIE E. CARDONE,
PHARM D, BCACP, FCCP

Associate Professor
Program director, Doctor of Pharmacy
Department of Pharmacy Practice
OB 226
Tel: 518-694-7875
katie.cardone@acphs.edu

Dr. Cardone's practice expertise is in ambulatory care nephrology, including dialysis and chronic kidney disease (CKD); she also currently serves as the director of clinical pharmacy services at The Collaboratory, a public health space in Albany, operated by the college. Through her clinical experiences and role as residency program director of PGY2 programs in nephrology and ambulatory care pharmacy, Dr. Cardone has gained a broad understanding of the needs of patients at risk or with CKD. Her research has focused on drug dosing and pharmacy practice delivery models for patients with CKD including those on dialysis. Dr. Cardone is a board-certified ambulatory care pharmacist and is a fellow of the National Kidney Foundation, the American Society of Nephrology, and the American College of Clinical Pharmacy.

JOSEPH CARRENO,
PHARM D, M.P.H.

Associate Professor
Department of Pharmacy Practice
OB 212B
Tel: 518-694-7225
joseph.carreno@acphs.edu

Dr. Carreno's research interests focus on the application of technology and epidemiologic methods to evaluate and develop antimicrobial stewardship programs. Specifically, Dr. Carreno is interested in pharmacists' roles in active surveillance, anti-infective related adverse event prevention, and bacterial epidemiology of infectious diseases.

JACQUELINE H. CLEARY, PHARM D, BCACP

Assistant Professor
Department of Pharmacy Practice
Building: OB 210D
Tel: (518) 694-7268
Email: jacqueline.cleary@acphs.edu

Dr. Cleary's overall research focus is in the area of pharmacy practice, specifically in pain, addiction, and pharmacogenomics. Dr. Cleary's practice site is Saratoga Hospital Medical Group which is a collaboration of several primary care offices with various specialties. Summer research student research opportunities would focus on collecting and analyzing data surrounding an opioid grant the medical group received. This grant specifically created a position for a pain management pharmacist to work on reduction of morphine equivalence, reduction in the co- prescribing of benzodiazepines and opioids, increasing yearly urine drug screening and pain agreement compliance, as well as in-home naloxone use. This work will join a collection of other research highlighting the value of a clinical pharmacist in this specialty to help advocate for more ambulatory care clinical pharmacy positions. Additionally, this work could easily be presented at a NY state poster session in the Fall of 2021.

RICHARD E. DEARBORN, PhD

Associate Professor, Chair
Department of Pharmaceutical Sciences
Biosciences Research Building (BRB) 301B
Tel: 518-694-7387
Richard.dearborn@acphs.edu

Dr. Dearborn's research focuses on development neurobiology in the fruit fly, *Drosophila*, in three primary areas: 1) The elucidation of vitamin D3 up-regulated protein 1 (VDUP1) tumor suppressor function during brain development, including VDUP1's role in neural stem biology; 2) Hedgehop (Hh)-dependent regulation of VDUP1 in cell proliferation, including how tumor cell-specific differences in Hh signaling affect pharmacological treatment strategies; 3) Molecular characterization of Eph receptor signaling pathways, which regulate axon guidance, vascular growth and tumorigenesis, through the study of several novel pathway associated genes. The lab emphasizes molecular-genetic approaches in these studies, each with clinical and translational relevance.

BARRY DECOSTER, PhD

Associate Professor
Department of Population Health Sciences
HAB 109
Tel: 518-694-7259
barry.decoster@acphs.edu

My research as a bioethicist focuses largely on ethical and philosophical issues in medicine and science, with an emphasis on the ethical reasoning of lay people/patients. My current projects focus on: (1) issues in LGBTQ health, women's health (especially birth), and racial minority health; (2) questions about the medicalization of healthcare (looking at how traits like birth, death, and sexuality, that were once considered normal variations are instead now seen as issues for clinical discussion and treatment); (3) virtue ethics within clinical and scientific settings (e.g., How to be a morally "good" patient? What character traits are needed for collaboration in scientific research? What shapes "integrity" of researchers?), and (4) ethical and policy concerns for public health programs involving the use of anonymous expedited partner therapies (EPT), the practice of filling anonymous antibiotics prescriptions to treat sexually transmitted infections.

PAUL DENVIR, PhD

Associate Professor
Department of Population Health Sciences
HA 117
Tel: 518-694-7139
paul.denvir@acphs.edu

My research is centered on interpersonal communication in healthcare settings. In the area of provider-patient communication, I'm identifying strategies for addressing potentially sensitive health topics, such as diet, exercise, substance use, and sexual activities. I am also interested in the interpersonal processes involved in healthcare teamwork, with recent work emphasizing the communication dynamics between pharmacists and physicians. My most recent scholarship projects are focused on game-based teaching and learning of health communication skills. In an academic context, well-designed games and simulations provide students with immersive educational experiences that engage creativity, critical thinking, social interaction, and collaborative problem-solving. My most recent project is an original academic role-playing game in health systems and health teamwork called "Save Our City." I designed the game to provide players with opportunities to "walk a mile in the shoes" of various health professions to better understand their contributions to the health system.

Students present their findings during the Student Poster Research Symposium on Thursday, April 7, 2022, in Albany, N.Y. Eric Yager, PhD, center.

Martha Hass, PhD, 4th from left, with graduate research students.

MARGARET DOLL,
PhD, MPH

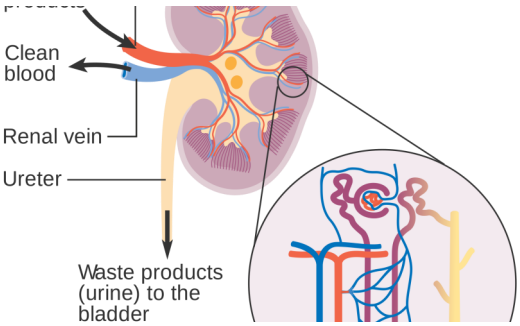
Assistant Professor
Department of Population Health Sciences
HAB 121A
Tel: 518-694-7731
margaret.doll@acphs.edu

My research interests are related to the epidemiology of vaccine-preventable diseases. Specifically, I am interested in the evaluation of the uptake of vaccines in a population (i.e., vaccine coverage), the effects of vaccines, vaccine programs, or vaccine policies on disease outcomes, and how we can optimize epidemiological methods to evaluate vaccine effects. Recent projects include a primary survey to evaluate the impact of the New York State (NYS) legislation to remove religious vaccination exemptions on NYS schools, secondary analyses of national survey data to evaluate U.S. trends in pediatric vaccine hesitancy, and evaluation of the effects of mandatory healthcare worker influenza vaccination laws on patient influenza outcomes using administrative medical records data.

DARREN W. GRABE,
B.S., PHARM D

Associate Professor
Department of Pharmacy Practice
OB 212N
Tel: 518-694-7310
darren.grabe@acphs.edu

Dr. Grabe's research interest is nephrology with a focus on patients with chronic kidney disease (CKD) stages 1-5, with primary attention to those patients not yet on dialysis. The major research objective is to characterize and optimize pharmacotherapy in this specific population to decrease hospital admissions and decrease potential and actual drug-related problems.



MARTHA A. HASS, PhD

Professor and Director of Research
Office of Research and Scholarly Activity
O'Brien 118
Tel: 518-694-7238
Martha.hass@acphs.edu

Dr. Hass' research integrates synthetic organic chemistry, pharmaceutical formulation and stability, biochemical assays, medicinal chemistry, and pharmacology. Her laboratory provides unique training opportunities for research students in the areas of drug synthesis, pharmaceutical formulation, topical drug delivery and assessment of drug efficacy. Major current projects are focuses on the synthesis and activity of new drugs for use as topical agents to treat skin diseases. One group of novel co-drugs are designed to replenish natural antioxidants in the skin for enhanced and extended photoprotection relative to existing topical products. Other topical agents under development utilize the co-drug approach to target hyperproliferation of keratinocytes and inflammation associated with psoriasis.

KEVIN M. HICKEY, PhD

Associate Professor
Department of Population Health Sciences
HAB 112
Tel: 518-694-7359
kevin.hickey@acphs.edu

My research is on spatialities in Africana literatures, visual arts, and music with focuses on travel, gender, food culture, ecology and ecophilosophies, birds, and Illichean conviviality.

PRADEEPA JAYACHANDRAN, PhD

Assistant Professor
Department of Basic and Clinical Sciences
OB 211M
Tel: 518-694-7260
pradeepa.jayachandran@acphs.edu

Antimicrobial resistance (AMR) poses a significant threat to humans, animals, and the environment. My primary research interest is understanding the genetic basis of antibiotic resistance in methicillin-resistant Staphylococcus aureus (MRSA), a gram-positive pathogen that causes nearly 11,000 deaths each year in the United States alone. My research focuses on the role of SOS and stress (ROS, antibiotic) response in acquisition of antibiotic resistance in Staphylococcus aureus. Bacterial DNA damage stress response, also known as SOS response, includes a conserved set of genes that are induced under DNA damaging conditions. Among these are genes involved in DNA repair pathway and error-prone polymerases. The increased expression of error-prone polymerase result on increased rate of mutations, which contribute to antibiotic resistance. RecA and LexA are the main modulators of this SOS response. Two main projects in the lab are: 1) studying the effect of RecA inhibitors on the emergence of antibiotic resistance; 2) identifying genes that play a role in SOS and stress response using a transposon mutant library. These studies will help us understand the pathogenicity and the mechanism of antibiotic resistance in MRSA and provide insights for the development of new therapeutics.

KIDEOK JIN, PhD

Assistant Professor
Department of Pharmaceutical Sciences
Biosciences Research Building (BRB) 105B
Tel: 518-694-7175
kideok.jin@acphs.edu

About 70% of estrogen receptor (ER) positive breast cancers have a significantly reduced risk of invasive breast cancer through the use of various endocrine therapies. Despite the relative safety and significant anti-neoplastic and chemopreventive activities of tamoxifen and aromatase inhibitors, many initially responsive breast tumors develop resistance and ultimately recur. The long-term mission of my laboratory is to understand the steps of the endocrine-resistant process in order to develop therapeutic approaches to prevent and treat endocrine-resistant breast cancer effectively. The ultimate goal of my research is to bring therapies into the clinic that will improve the survival of metastatic breast cancer patients. My current research is to investigate the secretome leading to the endocrine resistance in the crosstalk between endocrine-resistant breast cancer and tumor microenvironment. In addition, I have investigated the role of HOXB7 as an oncogenic transcription factor in breast cancer.

MICHAEL P. KANE, PHARM D, FCCP, BCPS, BCACP

Professor
Department of Pharmacy Practice
OB 212M
Tel: 518-694-7239
michael.kane@acphs.edu

Research Interests:

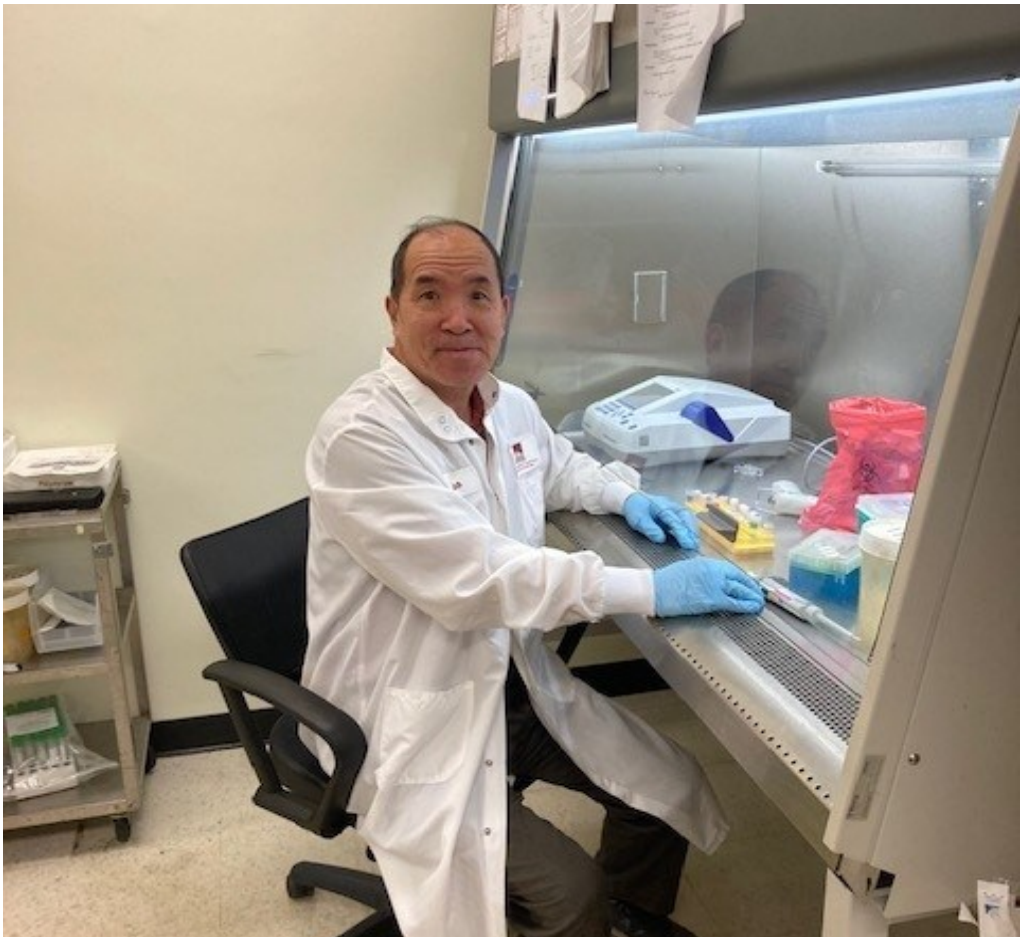
Assessing the safety and efficacy of new drugs in the management of diabetes mellitus and osteoporosis.

TIMOTHY LAROCCA, PhD

Associate Professor
Department of Pharmaceutical Sciences
O'Brien 211S
Tel: 518-694-7332
timothy.larocca@acphs.edu

Dr. LaRocca's research focuses on different forms of programmed cell death in eukaryotic cells. Programmed cell death is the controlled death of eukaryotic cells in response to specific, external stimuli or internal cellular damage. Several different programmed cell death pathways exist but apoptosis and the more recently discovered necroptosis are the major pathways with each serving as backups to one another. There are currently three broad projects in Dr. LaRocca's lab that focus on programmed cell death. One project explores the effect of hyperglycemia (high glucose concentrations as in diabetes) on apoptosis and necroptosis and how this condition may shift the balance of programmed cell death. Another project aims to define programmed cell death pathways activated in response to a broad group of bacterial virulence factors called pore-forming toxins. This project also aims to explore differences in programmed cell death in response to different pore-forming toxins. The third project is a continuation of Dr. LaRocca's previous discovery of necroptosis in human erythrocytes (red blood cells, RBCs). As RBCs are quite different from the rest of the cells in humans (they lack nuclei and mitochondria) it is of interest to explore the mechanism of this pathway in RBCs and its outcomes compared to necroptosis of nucleated cells.

Tim LaRocca and Matt Deragon in their lab with students



Zhou Ma, in Dr. Mailk's lab, working on the Francisella Project.

THOMAS LODISE, PHARM D, PhD

Professor
Department of Pharmacy Practice
O'Brien 212R
Tel: 518-694-7292
thomas.lodise@acphs.edu

Tom Lodise, PhD, specializes in infectious diseases with a research focus in clinical outcomes of antimicrobials. Dr. Lodise was the lead author and principal investigator on the PROVIDE trial, a seminal work that informed the updating of national practice guidelines for vancomycin. Vancomycin is the current drug of choice for confirmed and suspected methicillin-resistant Staophylococcus aureus infection, an antibiotic-resistant Gram-positive bacterial infection and noted "Serious Threat" by the Centers for Disease Control and Prevention (CDC). His work with minocycline on the ACUMIN trial informs the clinical care of patients with Acinetobacter baumannii infections, a resistant Gram-negative bacterial infection listed as an "Urgent Threat" by the CDC. Dr. Lodise has authored over ten papers in 2022 alone, many with students as co-authors. Dr. Lodise is currently funded to work on a collaborative project with the National Institute of Allergy and Infectious Diseases (NIAID), coordinated by Duke University. Dr. Lodise was the 2012 and 2021 ACPHS Researcher of the Year.

MEENAKSHI MALIK, DVM, PhD

Professor
Department of Basic and Clinical Sciences
O'Brien 211D
Tel: 518-694-7168
meenakshi.malik@acphs.edu

Dr. Malik's laboratory studies the complexities of host pathogen interactions for the development of improved prophylactics and therapeutics against important bacterial infections. She has a three-year grant by the National Institutes of Health to investigate the mechanisms by which *Francisella tularensis*, a category A biothreat agent survives inside the immune cells and suppresses the protective immune responses. A second area of research in the lab is to investigate the molecular mechanisms leading to the development of antibiotic resistance in methicillin resistant *Staphylococcus aureus* (MRSA) strains.

ANNE L. McCABE, PhD

Assistant Professor
Department of Basic and Clinical Sciences
OB 211J
Tel: 518-694-7299
anne.mccabe@acphs.edu

My research interests are focused on understanding mechanisms of antibiotic resistance in the opportunistic pathogen Klebsiella pneumoniae. Designated as an ESKAPE pathogen of high concern, *Klebsiella pneumoniae* is a frequent cause of hospital-acquired Gram-negative multi-drug resistant infections, and treatment options are becoming increasingly limited. As combination therapies of two or more antibiotics become common in treatment, understanding how the development of resistance to one antibiotic may influence susceptibility or resistance to others provides insight into identifying synergistic treatments options that can be more effective than single-drug therapies. As combination therapies of two or more antibiotics become common in treatment, understanding how the development of resistance to one antibiotic may influence susceptibility or resistance to others provides insight into identifying synergistic treatments options that can be more effective than single-drug therapies. As combination therapies of two or more antibiotics become common in treatment, understanding how the development of resistance to one antibiotic may influence susceptibility or resistance to others provides insight into identifying synergistic treatments options that can be more effective than single-drug therapies.

COLLEEN McLAUGHLIN, PhD

Associate Professor
Department of Population Health Sciences
HA 101B
Tel: 518-694-7392
colleen.mclaughlin@acphs.edu

Dr. McLaughlin is an epidemiologist studying the measurement of hospital quality and safety; the role of hospital finance systems on quality; and the interplay between finances, racial and economic disparities, and quality of care.

PATRICK MEEK, PHARM D, MSPH

Associate Professor
Department of Pharmacy Practice
OB 210B
Tel: 518-694-7873
patrick.meek@acphs.edu

Dr. Meek's research interests include investigating ways to prevent treatment failure and adverse drug therapy outcomes for patients with chronic conditions through review of safety reports from clinical trials and from spontaneous reported adverse events received during post-marketing surveillance. Identifying signals of medication intolerance early and addressing identifiable risk factors for appropriate medication use has tremendous potential to improve care and reduce medication adverse events. Additional areas of research interest include the measurement of adherence to chronic drug therapy in the ambulatory care setting and identification of risk factors for medication nonadherence using health care claims data. Because much of his work involves the analysis of administrative claims data, national survey data (including the National Ambulatory Medical Care Survey and the FDA Adverse Event Reporting System), he has extensive experience in the methods of observational research, and in the use of medical and pharmacy data systems for analysis of trends in healthcare utilization and prescribing. He is currently evaluating national trends in the use of gastroprotective therapy for patients at high risk for medication-related gastrointestinal side effects.

MARCEL MUSTEATA, PhD

Associate Professor
Department of Pharmaceutical Sciences
Biosciences Research Building (BRB) 105C
Tel: 518-694-7883
marcel.musteata@acphs.edu

Dr. Musteata's research interests include the development of analytical technology for pharmacokinetic studies and therapeutic drug monitoring. Students participating in the Summer Research program will apply newly developed pharmacokinetic analysis techniques to simultaneously measure free, total, and normalized concentrations of bioactive compounds. Students will be trained to use liquid chromatography coupled to tandem mass spectrometry for quantitative analysis and Monolix Suite for PK-PD data processing.

J. NICHOLAS O'DONNELL, PHARM D, M.SC.

Assistant Professor
Department of Pharmacy Practice
OB 212Q
Tel: 518-694-7203
nick.odonnell@acphs.edu

The O'Donnell research lab focuses on clinical and translational approaches to optimizing care for patients with infections caused by antimicrobial resistant pathogens. Our primary focus is pharmacokinetic/pharmacodynamic approaches to optimizing dosing and antimicrobial combination selection for highly-resistant gram-negative pathogens. To this end, we have completed studies evaluating combinations of novel and established antimicrobial agents against extensively drug-resistance pathogens such as *Pseudomonas aeruginosa* and *Acinetobacter baumannii*, both of which are recognized as critical antimicrobial resistance threats by the US CDC and WHO. Our ongoing work focuses on bacterial exposure-response using humanized exposures of antimicrobials in an in vitro hollow fiber infection model system. This translational approach allows for evaluation of clinically relevant antimicrobial exposures and their effect on bacterial growth and provides data that can be readily evaluated in a clinical setting.

MICHELLE A. PARENT, MS, PhD, MT(ASCP)

Associate Professor
Department of Basic and Clinical Sciences
O'Brien 212U
Tel: 518-694-7314
michelle.parent@acphs.edu

Vibrio parahaemolyticus, a Gram-negative bacterium, is the leading cause of seafood-related bacterial gastroenteritis in the United States. There is a dearth of literature regarding the host response to infection and pathogen elimination. Our goal is to characterize the host response to infection hoping to understand how it may evade the host innate response and potentially contributing to pathogenesis and death of the infected host. Currently, the laboratory has developed a murine model of systemic infection and is investigating the importance of the innate response in combating infection specifically we are determining how innate-lymphocyte cells (ILC) are playing a role during this infection.

WENDY M. PARKER, PhD

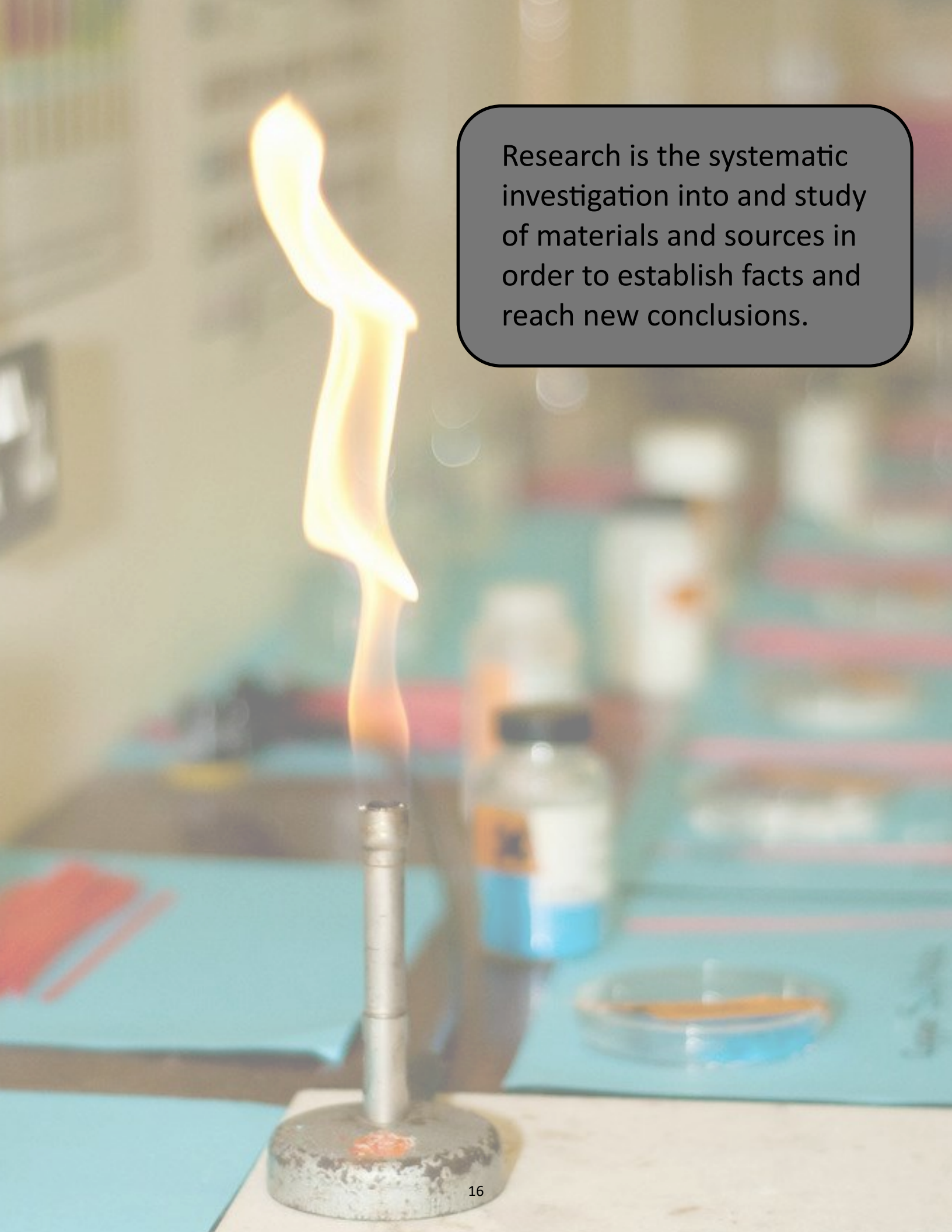
Associate Professor
Department of Population Health Sciences
O'Brien 225C
Tel: 518-694-7361
wendy.parker@acphs.edu

Broadly speaking, my research focuses on health disparities and understanding the social contexts of health and disease throughout the life course with a specific focus on vulnerable populations. I am exploring real world health problems and the social environments connected to them utilizing primary and secondary data analysis, including both qualitative and quantitative methods to understand, document and (hopefully) intervene in the health trajectories and outcomes of such populations. My current projects explore decision-making for patients connected to medication and health care management in several populations, notably young adults with diabetes and patients with chronic kidney disease. A second set of projects look at how women make fertility decisions and the role of assisted reproductive technologies connected to those decisions. In the Fall of 2018 ACPHS opened a new community health partnership site in the South End of Albany, The Collaboratory. My projects based in the Collaboratory focus on process and outcome measures for our new Public Health Pharmacy Team alongside community surveys specifically working on topics of food insecurity and medication management.

STACY M. PETTIGREW, PhD, MS

Assistant Professor
Department of Population Health Sciences
HA 119
Tel: 518-694-7228
stacy.pettigrew@acphs.edu

Dr. Pettigrew has several community-based research projects that focus on environmental health and justice and health disparities in the South End of Albany.



Research is the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.

JOHN M. POLIMENI, PhD

Associate Professor
Department of Pharmacy Practice
OB 210C
Tel: 518-694-7384
john.polimeni@acphs.edu

As a researcher, John Polimeni's interests lie in examining the intersections between economic development and the environment. This includes energy efficiency and sustainability, economic development, and sustainable agriculture.

MANISH B. SHAH, MS, PhD

Assistant Professor
Department of Pharmaceutical Sciences
Biosciences Research Building (BRB) 104C
Tel: 518-694-7343
manish.shah@acphs.edu

Research Interests: Human Cytochrome P450 (CYP) enzymes.

Project 1: Cytochrome P450 2C9. Genetic variations in CYP2C9 have resulted in altered metabolism of various drug substrates leading to adverse drug reactions. The goal is to characterize genetic variants using structural, biophysical, and functional methods and elucidate the differences in drug binding.

Project 2: Cytochrome P450 2C8. The glucuronide metabolites of the heart disease medications, clopidogrel and gemfibrozil, are known time-dependent inhibitors of CYP2C8 that leads to clinical drug-drug interactions with several other drugs. The aim is to determine the interactions and orientation of these glucuronides to CYP2C8 using structural and biophysical methods.

Project 3: Cytochrome P450 2U1. CYP2U1, expressed in brain and thymus, is involved in the metabolism of arachidonic acid and a mutation in this enzyme has been associated with hereditary spastic paraplegia. The research focus of the lab involves determining the X-ray crystal structure of CYP2U1.

NICOLE SHAKERLEY, PhD, MB(ASCP)CM

Assistant Professor

Department of Basic and Clinical Sciences
OB 211J
Tel: 518-694-7281
nicole.shakerley@acphs.edu

Acinetobacter baumannii is a gram negative opportunistic pathogen that presents both a nosocomial threat and impacts military personnel deployed overseas. *Acinetobacter baumannii (A. baumannii)* can resist the production of host-derived reactive oxygen and nitrogen species (ROS/RNS) through the upregulation of detoxifying enzymes. ROS/RNS also act as secondary messengers within host cells that can discreetly control cellular function. Constituents of a pathogens' antioxidant repertoire both protect it from oxidative stress but may also interfere with normal immune function. Several reports have indicated that *the A. baumannii* genome encodes for several antioxidant systems encompassing more than 11 separate proteins with the capability to detoxify most ROS/RNS species. Additionally, there have been studies indicating that mutation of key antioxidants, such as the catalase family members (katG and katE) or the superoxide dismutases, is detrimental to bacterial viability. Taken together we hypothesize that *A. baumannii* antioxidants modulate the intracellular redox environment to control host macrophage signaling and function. By identifying the bacterial redox factors that modulate host immune function we can develop novel therapeutic strategies to combat antibiotic resistant nature of this pathogen. Students wishing to work in my lab will be given projects that investigate the contribution of specific antioxidant mutants to the antibiotic resistance of A. baumannii. We currently have a panel of over 100 antioxidant mutants to screen in relation to several drug classes to investigate novel contributions of these proteins to the pathogens overall resistance profile.

BINSHAN SHI, PhD

Associate Professor

Department of Basic and Clinical Sciences
O'Brien 211P
Tel: 518-694-7116
binshan.shi@acphs.edu

Research in Dr. Shi's lab is mostly focused on the detection and analysis of different forms of retrovirus genomes during infection of human cells, and study their influence to host cell death pathways under different cellular environments. The ongoing research includes: 1) The development of a molecular marker indicating HIV-1 *de novel* infection that can provide guide to the treatment of AIDS disease. 2) The host cell death induced by HIV-1/HTLV-1 coinfection, with emphasis on the understanding of pathogenesis of retroviral infection at molecular level.

VIR SINGH, PhD

Assistant Professor
Department of Basic and Clinical Sciences
OB 211D
Tel: 518-694-7368
Vir.singh@acphs.edu

Our lab is focused on understanding the molecular mechanisms involved in HIV latency and HIV induced neuropathogenesis. HIV latency is the biggest hurdle in achieving HIV cure, thus elimination of latent reservoir still exists as a major challenge for researchers. In absence of cure, HIV infected individuals (despite the low viral loads) are at a higher risk of accelerated aging related comorbidities such as neurological disorders. In our lab, we need enthusiastic young scientists to investigate these two high priority research topics: **Project 1—** To investigate the consequences of HIV (Human Immunodeficiency Virus) mediated downregulation of Sonic hedgehog (Shh) signaling on brain homeostasis with specific focus on aberrant communication between astrocytes and other brain-resident cells (brain endothelial cells, pericytes, microglia and neurons). **Project 2—** To characterize select noncoding RNAs for their potential to establish HIV latency via- i) mediating Interferon signaling, and ii) regulating expression of HIV genome by epigenetic mechanisms. Successful completion of this study will identify novel targets and pave the way towards an HIV cure.

ERIC YAGER, PhD

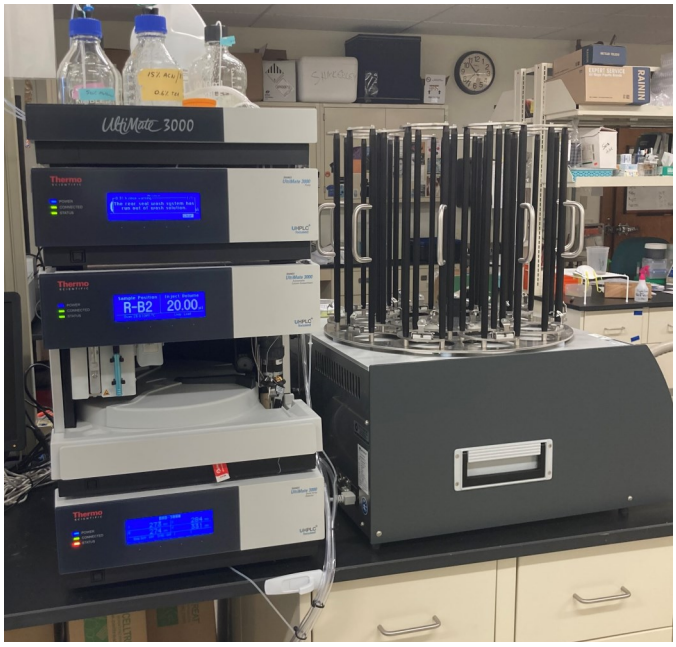
Associate Professor
Department of Basic and Clinical Sciences
O'Brien 211L
Tel: 518-694-7110
eric.yager@acphs.edu

Research in my laboratory is focused on the pathogenesis of, and host defense against, human enveloped RNA viruses. Several notable human diseases are caused by enveloped RNA viruses: influenza, AIDS, hepatitis C, dengue hemorrhagic fever, congenital Zika syndrome, and COVID-19. Novel insights into the relationship between viruses and human cells has the potential to lead to improved therapeutics and vaccines against these diseases. Currently, my team of undergraduate and graduate students are following these avenues of research: 1) the role of host lipid biosynthesis in RNA viral infection and 2) molecular recognition of inflammation during influenza virus infection.

HAIAN (ANDY) ZHENG, PhD

Associate Professor
Department of Pharmaceutical Sciences
Biosciences Research Building (BRB) 105
Tel: 518-694-7859
haian.zheng@acphs.edu

Our research group is interested in Complex Drug Products, such as botanicals, peptides and proteins from the nature. Interdisciplinary methodologies and translational strategies are used to reveal mechanisms of actions, evaluate product quality, and access benefits and risks of these therapeutics. Our recent research projects focus on cannabinoid-based products and their effects through endocannabinoid systems (ECS), especially on the Blood Brain Barrier (BBB) at the interface between the Immune, cardiovascular, and central nervous systems, which is an important therapeutic target for stroke, brain injuries, and neurodegenerative diseases.



The Ultimate 3000 HPLC instrument , located in Lab OB 231

Office of Research and Scholarly Activities

Martha Hass, PhD, Director

106 New Scotland Ave
O'Brien 118
Albany, NY 12208
www.acphs.edu

ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES