DIVISION OF

INFECTIOUS DISEASES

University of Pittsburgh

DEPARTMENT OF MEDICINE
ANNUAL REPORT | FY20

DIVISION OF

INFECTIOUS DISEASES

ANNUAL REPORT

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DIVISION OF

INFECTIOUS DISEASES

John Mellors, MD Chief

In FY 2020, the division was challenged by COVID-19 but continued to be successful in achieving its goals through the concerted efforts of its faculty, staff and trainees.

To address the pandemic, Division faculty and CCID staff helped implement the Convalescent Plasma Project at UPMC. Individuals willing to donate plasma undergo screening to ensure they are appropriate candidates for blood product donation, have been free of COVID-19 symptoms for at least 28 days, and have sufficient SARS-CoV-2 antibody titers. And, our Division faculty continued to provide medical directorship of Infection Prevention at UPMC Presbyterian and UPMC Mercy Hospital to help combat the spread of COVID-19. Throughout the pandemic, faculty continued to provide exceptional educational opportunities for graduate students, medical students, medical residents, and postdoctoral PhD and MD fellows.

The continuing goals of the division of Infectious Diseases (ID) are to:

- Provide state-of-the-art care that is easily accessible and responsive to the needs of patients and colleagues
- Mentor fellows in our training program to become the next generation of researchers and clinician educators
- Rigorously train medical students and residents in the disciplines of ID
- Develop and perform "cutting-edge" basic and clinical research that translates progress into clinical practice and improves the standard-of-care for diagnosis, treatment and prevention of infectious diseases
- Protect the public health from epidemics of infectious diseases including COVID-19 at present.

To increase the visibility of our Infectious Diseases division both to other medical providers and the general public, as well as highlight our division's multiple academic and research accomplishments, the **Center for Infectious Disease Outreach (CIDO)** was established in 2016. We also post information on various topics and current events related to the field of infectious disease, in order to provide education to the general public. This is achieved primarily through the use of social media, specifically Twitter, Facebook, Instagram, our own personalized blog post, and our educational and general Infectious Diseases division webpages.

For the 2019-2020 year, the following highlights should be noted:

- We now have nearly doubled the number of followers for our **Infectious Diseases Twitter account**, from 810+ to **1338+**. Through Twitter, our followers are routinely made aware of recent publications, accomplishments, educational activities, and events pertaining specifically to the division of Infectious Diseases here at the University of Pittsburgh Medical Center.
- We have completely revamped our **Infectious Disease fellowship webpage** in an effort to ensure that accurate, up-to-date information about our training program is made available in a user-friendly manner to all prospective training candidates. Specific additions include highlighting our new T32 fellowship training grant, outlining our current fellows' academic accomplishments, and providing detailed information on both clinical and research track options offered by our training program.

John W. Mellors, MD
Chief, Division of Infectious Diseases
Distinguished Professor of Medicine
Endowed Chair for Global Elimination of HIV and AIDS

Rima Abdel-Massih, MD
Assistant Professor of Medicine
Director, Infectious Diseases Fellowship Program
Director of Telemedicine

Cristian Apetrei, MD, PhD
Professor of Medicine, Immunology, and Infectious Diseases & Microbiology

Ricardo Arbulu, MD
Clinical Assistant Professor of Medicine
Director, Antimicrobial Stewardship Program,
UPMC Mercy

Hassan Badrane, PhD
Research Assistant Professor of Medicine

James J. Baran, MD
Clinical Assistant Professor of Medicine
Medical Director - Anal Dysplasia Clinic

J. Ryan Bariola, MD
Clinical Associate Professor of Medicine
Director, UPMC Antimicrobial Stewardship
Outreach Program

Tatiana Bogdanovich, MD, PhD, MSc
Clinical Assistant Professor of Medicine
Director, Fecal Microbiota Transplant Program

Karin E. Byers, MD, MS
Associate Professor of Medicine
Associate Chief of Clinical Care
Clinical Director, Division of Infectious Diseases
Director, Surgical Infections Unit

Shaoji Cheng, MD, PhD
Research Associate Professor of Medicine

Madhu Choudhary, MD
Associate Professor of Medicine

Cornelius (Neil) J. Clancy, MD
Associate Professor of Medicine
Associate Chief of VA Pittsburgh Healthcare System and Opportunistic Pathogens
Director, Mycology Program
Chief, Infectious Diseases Section, VA Pittsburgh Healthcare System

Matthew J. Culyba, MD, PhD
Assistant Professor of Medicine

Joshua C. Cyktor, PhD
Research Assistant Professor of Medicine

Brooke K. Decker, MD
Clinical Assistant Professor of Medicine
Director, Infection Prevention, VA Pittsburgh Healthcare System

Dimiter S. Dimitrov, PhD
Professor of Medicine
Director, Center for Antibody Therapeutics

Yohei Doi, MD, PhD
Associate Professor of Medicine
Director, Center for Innovative Antimicrobial Therapy

Bonnie A. Falcione, PharmD
Associate Professor of Medicine

Carolyn R. Fernandes, MD
Clinical Assistant Professor of Medicine

Nupur Gupta, DO, MPH
Clinical Assistant Professor of Medicine

Christiane M. Hadi, MD, MPH, MSc
Clinical Assistant Professor of Medicine

Ghady Haidar, MD
Assistant Professor of Medicine
Associate Director, Infectious Diseases Fellowship Program

Elias K. Halvas, PhD
Research Associate Professor of Medicine

Lee H. Harrison, MD
Professor of Medicine and Epidemiology
Associate Chief of Epidemiology and Education
Head, Infectious Diseases Epidemiology Research Unit

Ken S. Ho, MD, MPH
Assistant Professor of Medicine
Medical Director, Pitt Men's Study, Multicenter AIDS Cohort Study
Medical Director, Project Silk
Pharmacovigilance Safety Officer

Jana L. Jacobs, PhD
Research Assistant Professor of Medicine

Dontcho V. Jelev, PhD
Research Associate Professor of Medicine
Deputy Director, Center for Antibody Therapeutics

Tina Khadem, PharmD
Clinical Assistant Professor of Medicine
Associate Director, UPMC Anti-microbial Stewardship Outreach

Eun Jeong Kwak, MD
Associate Professor of Medicine
Transplant ID, Protocols and Performance Improvement Director

Sui Kwong Li, MD
Clinical Assistant Professor of Medicine

Wei Li, PhD
Assistant Professor
Assistant Director, Center for Antibody Therapeutics

Shihui Liu, MD, PhD
Associate Professor of Medicine
Principal Investigator, Aging Institute

Bernard J. C. Macatangay, MD
Associate Professor of Medicine
Associate Director, University of Pittsburgh Immunology Specialty Lab (ACTG)

Jane W. Marsh, PhD
Research Associate Professor of Medicine

Elise M. Martin, MD, MS
Assistant Professor of Medicine
Associate Medical Director of Infection Prevention and Hospital Epidemiology

Sarah K. McBeth, MD, MPH
Clinical Assistant Professor of Medicine
Medical Director, Pittsburgh Aids Task Force,
East Liberty Clinic

Kevin D. McCormick, PhD, MS
Research Instructor in Medicine

Deborah K. McMahon, MD
Professor of Medicine
Clinical Director, HIV/AIDS Care Center

Mustapha M. Mustapha, MBBS, PhD, MPH
Research Assistant Professor in Medicine

Sowmya Nanjappa, MBBS, MD
Clinical Assistant Professor of Medicine

Minh-Hong Nguyen, MD
Professor of Medicine
Director, Transplant Infectious Diseases
Director, Antimicrobial Management Program

Urvi M. Parikh, PhD
Assistant Professor of Medicine
Associate Director, Microbicides Trials Network
Associate Director, Virology Core Laboratory

Christian O. Perez, MD
Clinical Assistant Professor of Medicine

Sharon A. Riddler, MD
Professor of Medicine
Director, Clinical Research, Infectious Diseases

Palash Samanta, MBBS, MD
Clinical Assistant Professor of Medicine

Neel B. Shah, MD
Clinical Assistant Professor of Medicine
Associate Director, Infectious Diseases Fellowship Program

Kathleen R. Sheridan, DO
Clinical Associate Professor of Medicine
Director, Outpatient Parenteral Antibiotic
Therapy Program

Ryan K. Shields, PharmD, MS
Associate Professor of Medicine

Fernanda P. Silveira, MD, MS
Associate Professor of Medicine
Director of Clinical Operations, Transplant Infectious Diseases
Coordinator of Education, Division of Infectious Diseases

Nina Singh, MD
Professor of Medicine
Transplant Infectious Diseases, VA Pittsburgh Healthcare System

Nicolas P. Sluis-Cremer, PhD
Professor of Medicine
Associate Chief of Research and Outreach
Director of Laboratory Research, Division of Infectious Diseases

Graham M. Snyder, MD, MS
Associate Professor of Medicine
Medical Director, Infection Prevention

Giraldina J. Trevejo-Nunez, MD
Assistant Professor of Medicine

Daria Van Tyne, PhD
Assistant Professor of Medicine

Peter J. Veldkamp, MD, MS
Professor of Medicine
Director of Education, Division of Infectious Diseases
Director of Travel Health, Division of Infectious Diseases

J. Alex Viehman, MD
Clinical Instructor of Medicine

Peter J. Volpe, MD
Clinical Assistant Professor of Medicine

Mohamed H. Yassin, MD, PhD
Associate Professor of Medicine
Director of Infection Control, UPMC Mercy

- Due to the interviewing constraints created by COVID-19, we have created a **professional video** outlining the highlights of our Infectious Disease fellowship program and of our fellows/faculty, in order for prospective candidates to have a better understanding of what our program offers in terms of clinical care, research mentorship and long-term career development. This video will be distributed to all prospective fellowship candidates that are invited for an interview this year.
- We have also revamped our general **Infectious Disease UPMC webpage** by updating information on our clinical and research faculty as well as all other staff, providing detailed information about each of our clinical and research facilities within our division, and highlighting active clinical trials that are division is involved in.
- We have established an **Infectious Diseases blog** (idpittstop.wordpress.com) to provide commentary and analysis on various infectious disease-related current events, publications and topics, as well as to provide updates in the field of infectious disease from a host of experts in the field. Bloggers include our Infectious Diseases division faculty, fellows, pharmacists, and laboratory staff. This continues to be updated on a regular basis, with increased diversification on topics and guest bloggers.

Our divisional websites continue to generate high interest amongst the public, and is still the third most viewed amongst the subspecialties in the Department of Medicine, behind only Pulmonary and Cardiology.

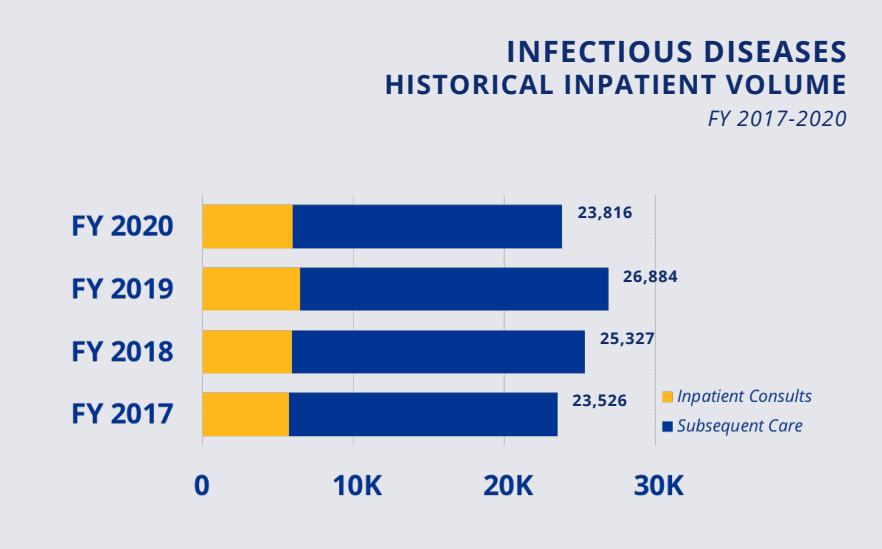
Overall, the division experienced a decrease in patient volumes by 12% in FY 2020 compared with FY 2019 (11% decrease in inpatient volume and 17% decrease in outpatient volume) compared with FY 2019. Regarding research operations, total research expenditures remained strong in FY 2020 compared with FY 2019 at $15.5 million.

CLINICAL
ACTIVITIES

The onset of COVID 19 in the winter of 2020 drastically reduced our ability to provide face to face visits, but our faculty quickly responded and utilized both video and phone visits to provide care to our patients.

As a result, the division's inpatient clinical activity decreased in volume in FY 2020 comparable to the prior year for all seven services: General ID, Transplant ID, Surgical ID, HIV-AIDS, Magee-Women's Hospital of UPMC ID Service, and UPMC Mercy Hospital ID Service (summarized in Table 1). In FY 2020, three full-time faculty were recruited to support the General ID Teaching Service, Transplant ID Service, the PACT program and the ID Connect, Telemedicine service.

Inpatient Service

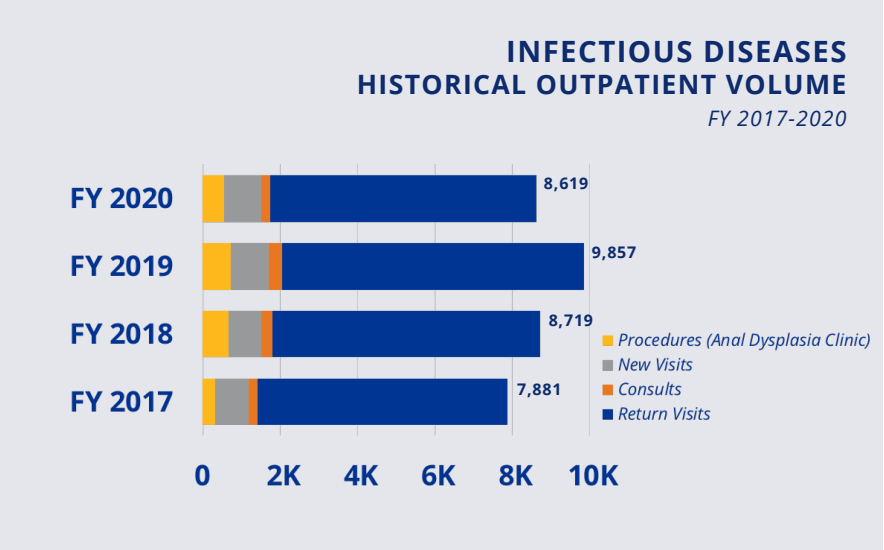


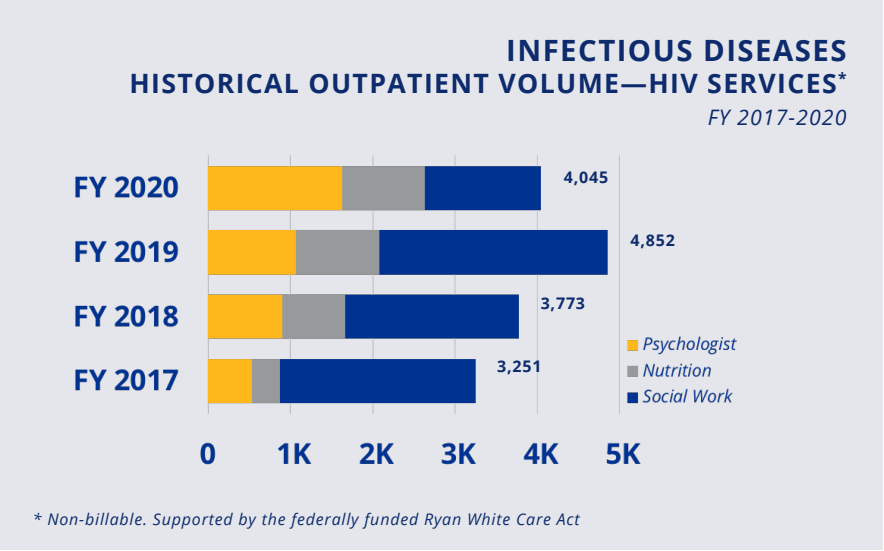
Consult teams round at UPMC Presbyterian-Shadyside Hospitals, Magee-Women's Hospital of UPMC, UPMC Mercy Hospital, Select Specialty Hospital, Western Psychiatric Institute and Clinic, and the VA Pittsburgh Health System (VAPHS). There are dedicated rounding teams for General ID, Surgical ID, HIV-AIDS, and Transplant ID (TID). The new TID consultation service at Shadyside for hematopoietic stem cell transplant patients and patients undergoing chimeric antigen receptor T cells therapy (CAR-T) has been welcomed by Shadyside Hospital. It has grown to a highly-productive service and is expanding to other hematologic malignancies. With the founding of Infectious Disease Connect, Inc., a UPMC Enterprises start-up company established in 2019, all existing telemedicine inpatient consult services have transitioned under this new venture for the Division, including inpatient consultations at UPMC Northwest, UPMC Horizon, and UPMC Jameson. Services have expanded to include non-UPMC hospitals including Armstrong County Memorial Hospital and the Heritage Valley Health System. Additional facilities have contracted for services with ID Connect and will be starting in the fall of 2020.

Overall inpatient volume decreased in FY 2020 as compared to the prior year. The number of inpatient consults were down 7% while subsequent visits were down 13%, resulting in a net total decrease in volume of 11% in FY 2020 vs. 2019.

Outpatient Service

Outpatients are seen in the Center for Care of Infectious Diseases (CCID) on the 7th floor of the Falk Medical Building, at UPMC Mercy Health Center, and at the Mario Lemieux Center for Blood Cancers at the Pittsburgh Cancer Institute. CCID offers consultations and longitudinal care for general and surgical infectious diseases, HIV/AIDS, HIV prevention through pre-exposure prophylaxis (PrEP), recurrent *Clostridium difficile* infections, transplant infectious diseases (TID), Anal Dysplasia Clinic (ADC), and Travel Health. An expanding Outpatient Parenteral Antibiotic Therapy (OPAT) program is also a key component of the CCID and serves patients who require intravenous antimicrobial therapy after hospital discharge. Patients with recurrent *Clostridium difficile* infections are evaluated for fecal microbiota transplantation (FMT). The HIV/AIDS Program provides primary care to approximately 1,832 persons with HIV in the tri-state area, many of whom receive care at CCID (PACT, n=1638), and at affiliated sites (Latterman Family Health Center in McKeesport, PA, Children's Hospital of Pittsburgh, and Conemaugh Memorial Center in Johnstown, PA). The ADC provides preventive care for individuals at risk for anal cancer. The division continues to provide HIV care services at Allies for Health and Well-Being (AHW). These services include medical directorship and outpatient clinic examinations at their facility in East Liberty. Sarah McBeth, MD, serves as the Medical Director at AHW and provides two outpatient clinic sessions per week for patients with HIV/AIDS along with PrEP consultations. A TeleHIV service has been started at UPMC Bedford and Altoona. The TID clinic performs pre-transplant evaluations and follow-up for solid organ recipients, outpatient consultations and hospital follow-ups for stem cell transplant recipients, patients with hematologic malignancies, and patients who received CAR-T therapy with infections at the Lemieux Center. Outpatient telemedicine ID services are provided at UPMC Northwest, Bedford, and Jameson hospitals.





The total number of outpatient billable visits/procedures decreased 17% in FY 2020 as compared with FY 2019. The number of procedures completed in the ADC decreased 25% in FY 2020 as compared with the prior year. Overall, ID specialty visits (General ID, HIV/AIDS, and TID) experienced a decrease of 10% in new/consult visits in FY 2020 as compared with FY 2019. Return visits decreased by 12% as compared with the prior fiscal year.

Infectious Disease Connect

The Tele-ID program at UPMC has been nationally recognized as a pioneer and leader of Tele-ID care. Given the success of this program, the high demand for Tele-Infectious Diseases services and the need to hire additional providers, **Drs. Rima Abdel-Massih** and **John Mellors** co-founded "Infectious Disease Connect" (ID Connect); a corporate entity funded and owned by UPMC-Enterprises. ID Connect was formed on March 1, 2019. David Zynn, was hired as president and CEO and **Dr. Abdel-Massih** as Chief Medical Officer. Tele-ID physicians in the division of ID will continue to provide services through ID Connect. Since the formation of ID Connect, 14 new faculty were hired to further expand the Tele-ID services. ID Connect partnered with many new sites for Tele-ID services: UPMC Susquehanna Soldiers and Sailors, Penn Highlands Huntingdon (JC Blair) Hospital, UPMC Somerset, Armstrong County Memorial Hospital and Heritage Valley Health System. Additionally, ID Connect provides backfill coverage for the UPMC Altoona site. In March of 2020, ID Connect acquired Ilum Health Solutions company, which provides a sophisticated software capability and predictive analytics to complement Tele-ID service offerings; the Ilum software focuses today on antimicrobial stewardship and surveillance. With this acquisition, ID Connect started a Tele-Antimicrobial Stewardship as service line which is now being offered to partners. The ID telemedicine consult services provide telephonic physician to physician consults to UPMC Soldiers and Sailors, Muncy and Lockhaven at UPMC Susquehanna, UPMC Chautauqua and UPMC Somerset. The ID Division continues to provide Outpatient ID telemedicine clinic visits at UPMC Northwest, UPMC Jameson and UPMC Bedford,

Fecal Microbiota Transplantation

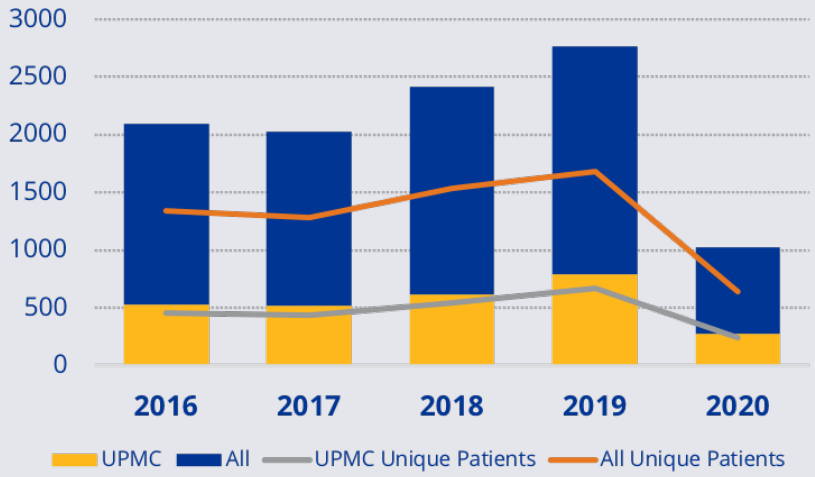
This outpatient service began in FY 2015 to treat recurrent *Clostridioides difficile* (C. diff) infections with fecal microbiota transplantation (FMT). **Tatiana Bogdanovich, MD**, has been the medical director for this program since FY 2016 and is working in collaboration with physicians in Gastroenterology (GI). Patients with recurrent C. diff are evaluated in a dedicated C.diff/FMT clinic that is a part of the CCID. FMTs are performed utilizing treatment doses obtained from carefully selected volunteer stool donors and specially prepared/stored in the FMT laboratory (Volunteer Stool Bank). Donor material undergoes extensive screening to prevent transmission of infectious pathogens including screening for multidrug-resistant organisms (CRE, VRE, MRSA, ESBL) and enterotopathogenic and Shiga toxin-producing *E.coli* in accordance with the FDA recommendations. FMT recipients can choose from several delivery methods that include naso-duodenal tube (NDT), enteroscopy/colonoscopy and via room temperature freeze-dried capsules intake. A total of 85 FMT procedures were performed utilizing volunteer stool donors over FY 17- 20 including 53 FMTs via capsules, 30 FMTs via colonoscopy and 2 FMTs via enteroscopy with 80% success rate. In addition to providing clinical service, we established a repository of pre- and post-FMT stool samples and clinical registry of both recipients and donors for basic and translational research purposes. The FMT Laboratory is also involved in FMT-based research with three internally funded projects focusing on both standardizing FMT for *C. difficile* infections and on utilizing FMT for non-*C.difficile* indications. Unfortunately, recruitment for the volunteer stool bank, a crucial part of the FMT program, had to be placed on hold in March 2020 due to the COVID-19 pandemic and need for SARS-CoV-2 testing of the donor's stool that is not currently available and is being sought out. Additionally, **Dr. Bogdanovich** serves as a Principal Investigator in two Phase 3 clinical trials of alternative treatment for C. diff (Ser-109 and ridinilazole) to provide novel therapeutic options for patients suffering from *C. difficile* infections.

Outpatient Parenteral Antibiotic Therapy (OPAT)

The OPAT program began in December 2013. The program is designed to monitor patients discharged from Presbyterian, Shadyside (that are followed by BMT ID), Magee, Northwest, Jameson, Horizon and Shenango Valley hospitals on intravenous antibiotics to prevent 30-day readmission rates and adverse events. **Kathleen Sheridan, DO**, is the medical director; and under her direc-

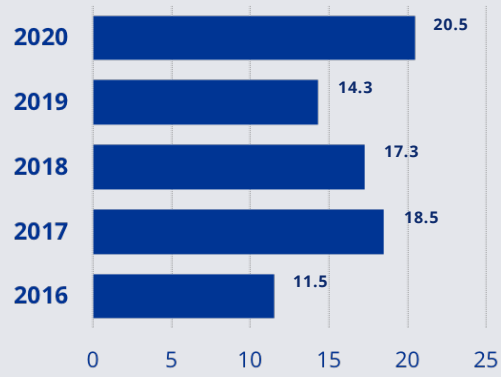
tion, the readmission rate for these patients has decreased from 32% to 14%. Patients are monitored by the OPAT team, including an ID trained pharmacist, a pharmacy coordinator, two nurse coordinators, and two physician extenders. The volume of outpatients monitored each month has increased over time while the readmission rate remains around 16%. Patients that are evaluated in the outpatient clinic after hospital discharge have the lowest readmission rates. The OPAT clinic is staffed six half days a week by the APP with additional visit slots available on the physician schedule throughout the week. We provide telemedicine visits for patients at home or in a facility. We also have the ability to provide telemedicine follow up utilizing any of our outpatient telemedicine clinics. Approximately 40% of patients monitored are UPMC Health Plan patients. Based upon HP financial analytics, this program prevents one $12,500 hospital admission per month and saves $417 per discharge.

OUTPATIENT PARENTERAL ANTIBIOTIC THERAPY
PATIENT VOLUME
2016-2020



Note: Patient Volume reported in 2020 represents calendar year (CY) activity from January-June 2020.

OUTPATIENT PARENTERAL ANTIBIOTIC THERAPY
30-DAY READMISSION RATE
2016-2020



Program average: 16.4
Baseline: 32

QUALITY IMPROVEMENT
INITIATIVES

When opportunities for improvement are identified in any aspect of the program, such as medical care, fiscal, or administrative practices, a Continuous Quality Improvement (CQI) initiative is developed, appropriately constituted teams are assembled, often including providers and staff, and a team leader is identified. ID fellows receive training in QM and are involved in QM projects in the second year of fellowship. The QM Coordinator educates fellows regarding CQI methods.

Quality Improvement (QI) projects were submitted to the 2020 UPMC Presbyterian and Shadyside Quality & Safety Fair and are listed below:

- **Increasing Care Engagement amongst People Living with HIV at a Ryan White Hospital-Based Clinic (CCID-PACT) through a Text Messaging Intervention** (**Nupur Gupta, DO, MPH**; **Sarah McBeth, MD, MPH**; Ella Kaplan; Becky McDermott; **Deborah McMahon, MD;** and **Linda Despines**)
  - *Problem/Opportunity:* At the PACT clinic, 90% of the patients are virally suppressed (viral load < 200 copies/ml). Although this is higher than the national average (51%), PLWH not retained in care carry the highest risk of co-morbidities and transmission, thus we need new interventions to engage them.
  - *Steps, Strategies and Implementation Plan:* Retrospective chart review of PACT patients with an HIV viral load ≥ 200 copies/ml from July 1, 2017 to June 30, 2018 to identify barriers.
    - Obtain approval from the UPMC Legal Division and ISD to send text messages
    - Eligible patients must sign a written consent giving permission to send text messages.
    - Once consented, the social worker will send weekly text messages re: appointments, medications, and motivation.
    - In the group receiving text messages, effectiveness of the intervention will be measured by tracking their appointments, viral loads, and ART prescriptions.
  - *Lessons Learned and Barriers Encountered:* Small sample size and short timeframe of study; difficulty in reaching this vulnerable population for consent; subjectivity in barrier assessment; lack of cellphone ownership amongst eligible patients; potential harms with text messaging (i.e., inadvertent disclosure of PHI, cost, and technical glitches). Lessons: Social workers are important members of the medical team; text messaging can be a great tool for certain high-risk populations.
  - *Outcomes and Opportunities for Spread:* In the intervention group, although not statistically significant, there was an increase in patients who kept an appointment, had a viral load <200 copies/ml, and had ART dispensed. Overall, there was an improvement in all indicators. The most common barriers to viral suppression across the eligible group were mental health, communication, and insurance. In the intervention group, there was a statistically significant difference in addressing the communication and insurance barriers. Majority of the patients who had mental health as a barrier had at least one visit with a PACT therapist as a result of retention in care. Not practical clinic-wide, but can be considered for high-risk groups.

- **Antibiotic Management Program: Quality Initiative to Shorten Duration of Antibiotics in Enterobacteriaceae Bacteremia** (**Alex Viehman, MD**; Eli Goshorn, MD; Gordon Scott; Erin McCreary, PharmD; Rachel Marini, PharmD; **Peter Volpe, MD**; **Minh-Hong Nguyen, MD**)
  - *Problem/Opportunity:* Long duration of therapy in Gram-negative infections is not superior than shorter duration, provided the patient has improved and has source control. While studies have demonstrated safety in these blood stream infections, some patients at UPMC Presbyterian are not suitable for short course therapy due to the source and/or severity of their infection, their immune status or presence of resistance. We planned to used to opportunity to monitor all gram-negative blood stream infections and intervene on low risk patients to recommend short course therapy.
  - *Steps, Strategies and Implementation Plan:* Starting January 2019, all patients with Gram negative bacteremia were tracked by the antibiotic management team. Patients with Enterobacteriaceae (*E. coli, K. pneumoniae, P. mirabilis* etc.) were evaluated for low risk infections with rapid improvement: Line or Urine source of infection. If criteria were met, the team contacted the treatment team (primary or ID consultant) to suggest 7-day duration of therapy.
  - *Lessons Learned and Barriers Encountered:* After six months of intervention, 80% of patients had an attempted intervention, of which 67% were accepted. Short course therapy (<10 days) was given in 53% patients during intervention period, an increase from 10%). The duration of therapy for low-risk patients decreased from 14.5 days to 8 days. All aims were met. Barriers included resistance from treatment and ID teams along with short admissions with weekend discharges. Lessons learned included overall enthusiasm for the project by the teams, which increased over time.
  - *Outcomes and Opportunities for Spread:* Enthusiasm for the project has been high from Infectious Diseases division. Discussions are ongoing about expanding indications in 2020. The preliminary data was presented at IDWeek 2019 in poster form and will be submitted to UPMC Quality Fair.

- **Health Catalyst & Infection Prevention: Using Healthcare Analytics to Improve Quality Outcomes in Central Line Care** (**Elise Martin, MD, MS**; Erin Cox; Abby Valek; **Graham Snyder, MD, MS**; Ashley Ayres; Victoria Novak; Joseph Penzelik; Casey Lewis; Wendy Lynch; Audrey Paul)
  - *Problem/Opportunity:* The CLABSI bundle was developed to reduce high CLABSI rates at PUH/SHY and includes necessity documentation, dressing changes, tubing changes, cap changes, and CHG bathing. Compliance with all components of the bundle have been low. The purpose of this project is to develop an app to make tracking easier and improve compliance.
  - *Steps, Strategies and Implementation Plan:* We developed a Health Catalyst application to track all components of the CLABSI bundle in real time and develop daily reports that units can use to make sure all patients are compliant with the bundle in real time. We piloted the application and reports, and sent them Monday through Friday to all high risk units so they can address overdue items in real time without needing to perform time intensive chart audits.
  - *Lessons Learned and Barriers Encountered:* Compliance with all components improved from 62% to 66%, with the largest improvements in dressing changes (72% to 81%) and CHG bathing (40% to 80%).
  - *Outcomes and Opportunities for Spread:* Developed a functional application and reports that units can use to improve patient care in real time. Plan to spread use to all units at PUH and SHY so all units can improve compliance.

- Improving Adherence to Daily Chlorhexidine Treatment Baths to Reduce Healthcare Associat-

ed Infections (**Elise Martin, MD, MS**; Ahmed Babiker, Abby Valek, **Graham Snyder, MD,MS;** Ashley Ayres, Victoria Novak, Joseph Penzelik, Casey Lewis, Betsy George, Linda Despines, Kathy Henderson.)

- *Problem/Opportunity:* CHG bathing can decrease healthcare associated infections, including CLABSI and SSI. Our policy is for all patients to get daily CHG bathing, unless contraindicated, but baseline compliance was low (only 24-33.7%). The purpose of this project was to increase compliance to >90%.
- *Steps, Strategies and Implementation Plan:* Our team performed audits confirming low compliance. We conducted interviews with staff and patients to identify barriers and areas for improvement. We developed and disseminated education for nurses and PCTs, with a focus on CHG as a "treatment." We developed unit reports to assist in daily compliance. We updated the hospital bathing policy based on updated research and CHG can be used on the entire body, eliminating need for 2 bathing products. We developed targeted patient education to display in patient rooms.
- *Lessons Learned and Barriers Encountered:* CHG bathing compliance improved on bedside audit from 24% to 62% and on chart audit from 33.7% to 75.1%, and now multiple units have compliance >90%.
- *Outcomes and Opportunities for Spread:* Plan to spread successful interventions to all units at PUH and SHY with the formation of the new STOP HAI: STOP CLABSI campaign focused on CHG bathing treatments.

  NB: This project received Third Place in the Quality Category at the UPMC Presbyterian Shadyside Quality & Safety Fair 2019/2020.

✦ **Uncharted Territory: Isavuconazonium Capsules Administered via Enteral Feeding Tube** (**Erin McCreary, PharmD; Rachel Marini, PharmD; Ryan Rivosecchi, PharmD; Lauren Sacha, PharmD; Ryan Shields, PharmD, MS;** Alfred L'Altrelli, PharmD; **Fernanda Silveira, MD, MS;** Matthew Morrell, MD; **Minh-Hong Nguyen, MD**)

- *Problem/Opportunity:* Isavuconazole (ISA) is an antifungal available in both intravenous (IV) and capsule formulations for the treatment of invasive aspergillosis and mucormycosis. Prescribing information states capsules should not be chewed, crushed, dissolved, or opened. Consequently, patients unable to take medications by mouth are precluded from capsule therapy. Intravenous therapy is associated with more complications and increased healthcare costs. Based on pharmacokinetic data, we hypothesized patients with enteral feeding tubes (EFT) could receive isavuconazole via opened capsules.
- *Steps, Strategies and Implementation of Plan:* Solid organ transplant patients with an EFT receiving IV ISA were prospectively identified from October 2018-October 2019 by the antimicrobial management program. Patients appropriate for EFT therapy per the IV-to-PO UPMC system protocol were discussed with the pulmonary and infectious diseases teams prior to conversion. All patients receiving ISA via EFT had therapeutic drug monitoring (TDM) performed.
- *Lessons Learned and Barriers Encountered:* **Barriers:** The success of this QI project requires provider acceptance of dosing strategy against FDA-labeling, thus a series of meeting between AMP staff, TID director and transplant pharmacists and physicians for discussion of approach. **Lessons Learned:** 1) All members of care team must understand supporting evidence and goal of medication recommendation for success; 2) Providing data back to physicians, pharmacists, case managers, and nurses on the care team supports ongoing improvement work.
- *Outcomes and Opportunities for Spread:* Fourteen patients were identified. All lung transplant recipients, 64% male, mean age 46 years. Four patients had TDM performed while receiving IV therapy and subsequently EFT therapy; serum concentrations were

equivalent for IV and EFF. Mean EFT concentration was 1.8 mg/L (range 0.3-5.2). A total of 425 inpatient and 102 outpatient IV ISA doses were avoided resulting in drug cost savings of $ 53,383. Administration of ISA via EFT is safe and achieved clinically detectable serum concentrations. Future efforts will continue to avoid IV administration of ISA when appropriate.

NB: This project received First Place in the Innovation Category at the UPMC Presbyterian Shadyside Quality & Safety Fair 2019/2020. This paper has also been accepted for publication in Journal of Antimicrobial Agents and Chemotherapy.

- **Impact of a Beta-Lactam Allergy Evaluation and Management Pathway on Aztreonam Utilization** (Erin McCreary, PharmD; Rachel Marini, PharmD; **Ryan Shields, PharmD, MS**; David Weber, MD; Robert Volosky, MD; **Minh-Hong Nguyen, MD;** Louise-Marie Oleksiuk, PharmD, BCPS; Michael Trisler, PharmD, MPH; Andrei Petrov, MD)
  - *Problem/Opportunity:* UPMC Presbyterian Shadyside are two of the highest users of aztreonam across the UPMC enterprise. Aztreonam use should generally be limited to patients with severe penicillin allergies. Given its lack of gram-positive coverage, aztreonam is often combined with vancomycin. Both of these therapies have been linked with the emergence of drug resistant organisms, toxicities, and inferior treatment outcomes. Considering that over 90% of patients with reported penicillin allergies can tolerate penicillins and cephalosporins, it is imperative to clarify penicillin allergies to help ensure optimal selection of antibiotic therapy.
  - *Steps, Strategies and Implementation of Plan:* The UPMC Presbyterian and Shadyside antimicrobial stewardship programs partnered with allergy/immunology to develop a beta-lactam allergy evaluation and management (BLAEM) pathway. Our local antimicrobial stewardship programs subsequently educated approvers of aztreonam on the BLAEM pathway, and starting in March 2019, began conducting daily prospective audits with intervention and feedback of patients on aztreonam. The newly developed BLAEM pathway was applied to help safely challenge patients to preferred, first-line beta-lactam therapy in lieu of aztreonam. Aztreonam utilization was tracked monthly throughout this initiative and was reported in days of therapy (DOT) per 1,000 patient days (PD).
  - *Lessons Learned and Barriers Encountered:* **Barriers:** difficult to ensure allergies updated correctly in our electronic health record without IT changes (e.g., admission assessment form, mandatory fields and templated allergy fields); absence of a graded challenge PowerPlan to facilitate order entry for patients deemed appropriate candidates for beta-lactam therapy; given lack of approval requirement for aztreonam in the Emergency Department and Operating Rooms, use there is less scrutinized; prospective audit with intervention and feedback limited to daylight on weekdays. **Lessons learned:** creation and subsequent dissemination of a beta-lactam allergy assessment questionnaire and corresponding BLAEM pathway empowered prescribers to appropriately challenge patients to beta-lactams when indicated; timely prospective audit with intervention and feedback limits unnecessary continuation of aztreonam therapy beyond Emergency Department use and/or initial approvals; Theradoc alerts help ensure real-time patient review by antimicrobial stewardship team followed-by feedback with prescribers near the time of order entry.
  - *Outcomes and Opportunities for Spread:* Median overall aztreonam utilization decreased 50% from 27.15 (baseline) to 13.2 (post-implementation) DOTs/1,000 PD, far exceeding the targeted goal of a 25% reduction. Thus, strategies employed were successful in decreasing unnecessary aztreonam utilization across UPMC Presbyterian and Shadyside campuses by utilization of the BLAEM pathway. Future efforts will aim to expand this pathway to the perioperative setting.

NB: This project received Second Place in the Collaboration Category at the UPMC Presbyterian Shadyside Quality & Safety Fair 2019/2020.

HIV/AIDS

The Quality Management (QM) Committee oversees quality activities for the **HIV/AIDS Program**'s primary care clinic (PACT) and the outpatient General Infectious Disease Clinic. The QM Committee is an interdisciplinary team that meets at least 10 times per year, with specific project teams that meet more frequently. The QM Committee is co-chaired by the HIV/AIDS Program's medical director (**Deborah McMahon, MD**) and CCID Administrative Director (**Paula Ziemski, CPC, PHR, SHRM-CP**) and guided by a QM coordinator (**Linda Despines, RN, BA**). Other ID physicians and staff attend on a scheduled basis. Key quality indicators used to assess performance are reviewed at QM Committee meetings and HIV and ID Provider meetings. The HIV Program reports on key HIV-related indicators to the Health Resources Services Administration's (HRSA) HIV/AIDS Bureau (HAB) on a regular basis for benchmarking purposes.

Transplant Infectious Diseases (TID)

Over the past year, the **TID** service has engaged in several quality improvement and research projects:

- Transplant ID has received funding from Gilead Sciences, Inc., to lead a pilot study of transplanting organs (heart, lungs, kidney and liver) from donors with HCV serology positive and either HCV NAT positive or negative to organ candidates with HCV serology negative. This study increases the availability of organs for our candidates. Since IRB approval in the first quarter of 2019, 10 kidney transplants, 9 heart transplants, 9 lung transplants and 4 liver transplants from a HCV NAT positive donor have been performed under this protocol.
- TID has expanded its clinical trial protocols to HSCT and hematologic malignancy patients. Active trials that can enroll HSCT and hematologic malignancy patients include a trial of F2G for difficult to treat invasive mold infections and a phase 3 trial of DAS-181 for lower respiratory tract infection due to parainfluenza.
- Improving the hygienic cleanliness of health care linen provided to our patients. Baseline health care linen data at PUH showed that up to 37% of linen was contaminated with Mucorales, classes of organism that caused fatal diseases among our solid organ transplant patients in 2015 and 2016. Systemic investigation of linen at PUH and at Paris Linen agency identified the 2 sources of linen contamination (environment at Paris and dryers). These data were shared with the laundry, which enacted environmental remediation. Lint control measures were major steps undertaken. Healthcare linen has maintained sustained hygienically clean for Mucorales status on all post-remediation dates of microbiologic testing since June 2017. There has not been any Mucorales recovered from Paris Linen, and the rate of Aspergillus contaminated linen was ≤2%. Given the significant improvement in linen hygiene, TID service introduced a stepwise approach. The first step was to de-escalate isavuconazole prophylaxis which was implemented from September to November 2018. After a year of observation and no cases of hospital-acquired mucormycosis was observed, TID introduced the second step which is total elimination of the usage of bio-burden reduced linen in July 2020 (this step had to be delayed due to COVID-19). These steps altogether will lead to a save of ~2 millions dollars per year

Antibiotic Management Program (AMP)

Over the past year, the **AMP service** has engaged in several quality improvement and research projects:

- In August 2018, the AMP service at UPMC-PUH campus received the designation of

Antimicrobial Stewardship Center of Excellence by the Infectious Diseases Society of America. PUH was recognized for having a high quality AMP service that has achieved standards established by the Centers for Disease Control and Prevention (CDC).

- Total expenditures: The total budget of antimicrobial expenditure was decreased by 14% in 2019 compared with 2018 (~$1.1M)

AMP EXPENDITURES

	FY18	FY19	% DECREASE
Antibacterial agents	$5,375,698	$5,294,580	-2%
Antifungal agents	$2,674,583	$1,617,577	-40%
Total antimicrobial	***$8,050,281***	***$6,912,157***	***-14%***

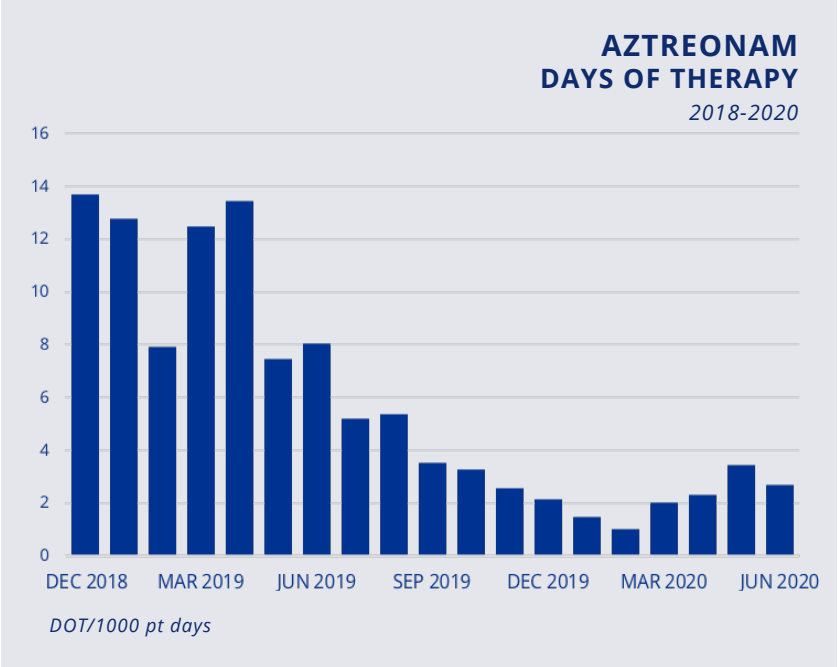
Highlights of Quality Improvement projects for 2019 - 2020:

- A multidisciplinary AMP project that involved ID physicians and pharmacists demonstrated that 1) early intervention by ID pharmacist to assure early effective therapy for bloodstream infections (BSI) coupled with 2) review and identification of patients with low-risk and uncomplicated BSI and 3) intervention with primary service by an ID physician significantly reduced the duration of antimicrobial therapy (from median of 15 days prior to intervention to 8 days after intervention) without increased rates of recurrence, readmission, or mortality at 30 days.
- A new β-lactam graded-challenge pathway was introduced in collaboration with Allergy and Immunology to optimize utilization of front-line β-lactatm agents and decrease utilization of second-line agents, including aztreonam, clindamycin, and fluoroquinolones. Since drug cost can vary from year to year, we assess both expenditure (financial metrics) and DOT (days of therapy/1,000 patient-days). DOT (total # of days for a specific antibiotic) is a metric set by WHO. Aztreonam is a mediocre Gram negative antibiotic, and was previously reserved for patients with severe penicillin allergy. Over this past year, we 1) reviewed and advised HCW against using aztreonam; 2) introduced allergy pathway and 3) HCW education. The end result is a decrease in 46% based on fiscal metrics and 31% based on DOT metrics.

AZTREONAM USE

FISCAL METRICS			DOT METRICS		
2018	2019	% DECREASE	2018	2019	% DECREASE
$399,559	$216,273	-46%	13.7	9.4	-31%

- Over this past year, AMP (with the full support of ID Chief) collaborates with the Clinical Microbiology Lab to introduce rapid diagnostics to improve patient care by administering timely antimicrobial therapy, and at the same time, de-escalating unnecessary use of antibiotics. In April 2020, we have introduced rapid (in 90 minutes) identification of genus/species of Gram positive bacteria and their genetic resistance determinants directly from positive blood culture bottles. The results are called back to AMP team who in turn communicates with primary service and offers antibiotic recommendations. AMP is working with the Clinical Microbiology Lab to validate

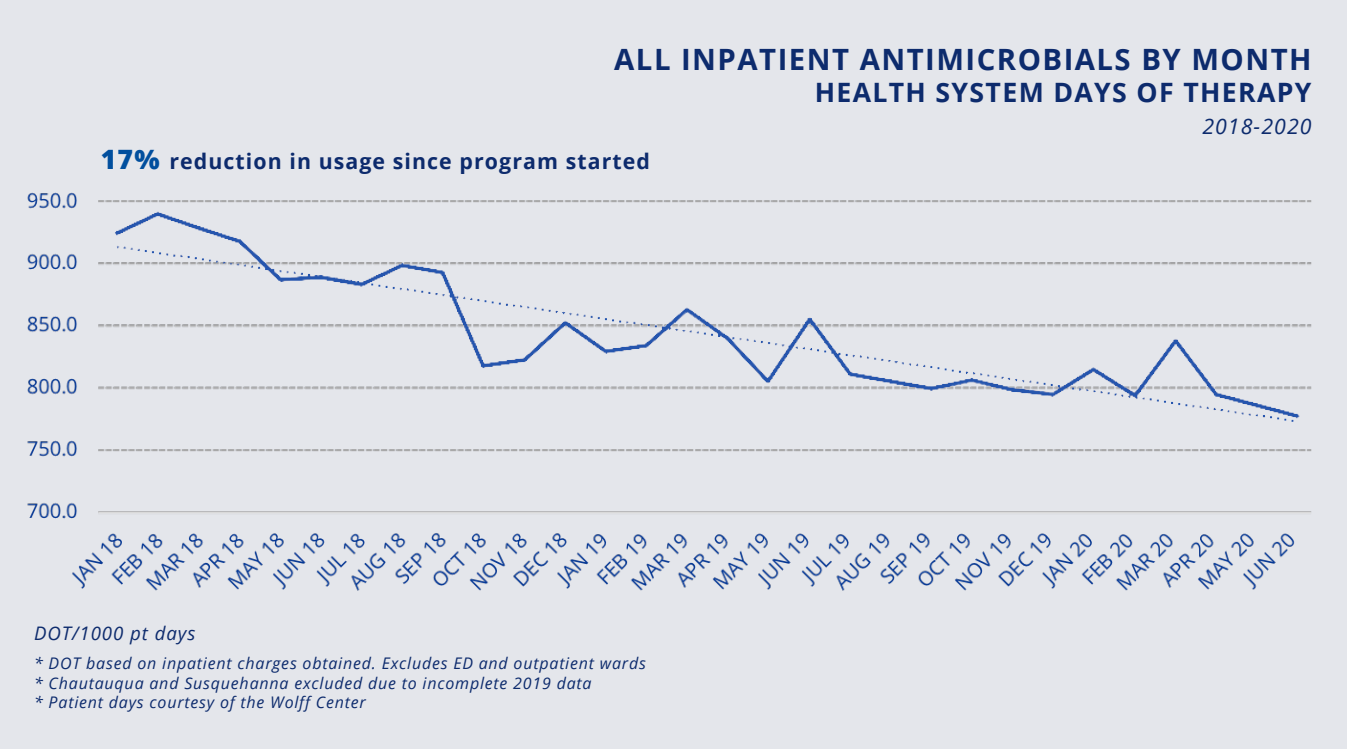


Rapid Diagnostics for Gram negative bacteremia.

- The **XDR Pathogen lab** was cleared by CLIA in March 2019, and is now able to perform patient's sample without any restriction. The lab performs in real-time molecular identification of resistance determinants for b-lactam antibiotics and antifungal, the results of which are shared with ID physicians for optimization of antimicrobial therapy. These results are also shared with the Infection Control team for isolation purpose. The lab also evaluates novel diagnostic tests for QI or research study. From 7/1/2019 to 6/30/2020, 137 carbapenem-resistant Enterobacteriaceae from patients at UPMC PUH/SHY were tested, including 101 and 36 isolates from clinical and rectal surveillance cultures, respectively. Overall, 16% (22/137) were found to harbor carbapenemase enzymes, which facilitated rapid, targeted treatment where clinically indicated. Among the remaining isolates, novel and expensive antibacterial agents that inhibit carbapenemase enzymes were appropriately reserved.

Community Hospital Antimicrobial Stewardship Efforts (CHASE) Program

UPMC supports and funds an AMP Outreach program to curtail the use of inappropriate antibiotics. Over a 2.5-year period (Jan 2018-June 2020), we have observed a 17% reduction in inpatient usage across the health system. **CHASE** assists all hospitals with issues related to accreditation and requirements for antimicrobial stewardship that are now mandatory for CMS compliance and the program now reports inpatient antibiotic usage at individual hospitals on a quarterly basis. This information is shared with individual hospitals and is used to identify areas for improvement at each hospital. It is also used by local hospitals to meet TJC and CMS requirements for monitoring antibiotic usage.



CHASE interacts, to varying degrees, with all UPMC hospitals that are integrated into the health system EMR, and it continues to work to standardize antibiotic usage across the health system where possible and to assist with individualization of antibiotic usage at hospitals with specific patient populations or unique resistance patterns. Several hospitals were brought online in 2019 (Chautauqua and Susquehanna system) and are now part of our efforts. In addition, CHASE is providing general education and support to clinical pharmacists at individual UPMC community hospitals, as well as

assisting with specific interventions at individual hospitals based upon their local usage patterns. And, often in conjunction with the Wolff Center and the health system Infection Prevention program, CHASE assists with various system-wide initiatives that overlap with antimicrobial stewardship.

Infection Prevention Program

The **UPMC Infection Prevention and Control (IP&C) program** is recognized in the UPMC community as a critical partner in patient safety. Led by division faculty **Graham Snyder, MD, MS** (Medical Director), and **Elise Martin, MD, MS** (Associate Medical Director), with **Ashley Ayres**, Director, the IP&C program is steading growing as an operational, educational, and research enterprise.

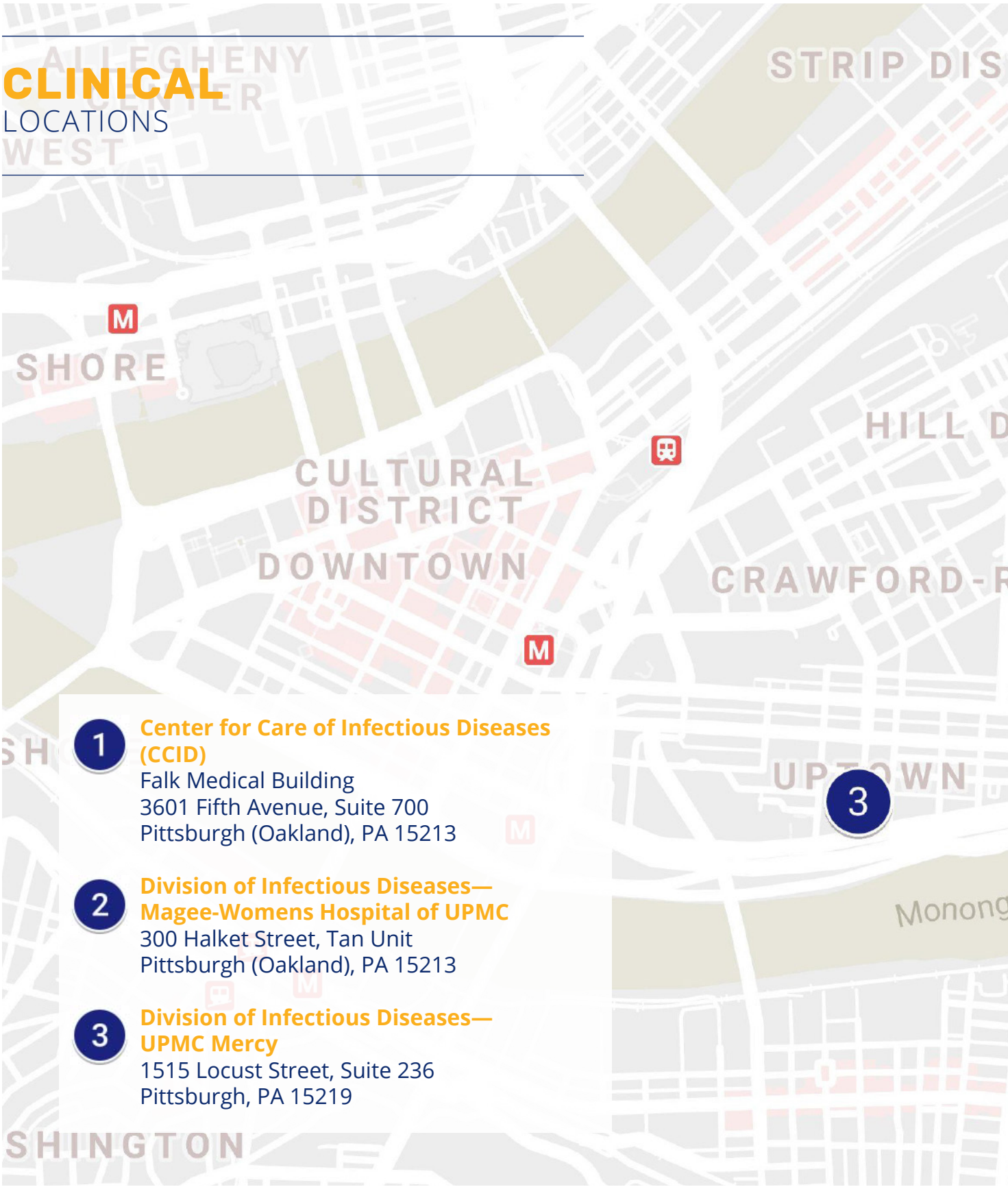
- **Operations:** The UPMC Presbyterian IP&C team, integrating this year with the Shadyside team, is reducing central-line associated blood-stream infections (CLABSI), catheter-associated urinary tract infection (CAUTI), and *Clostridioides difficile* healthcare-associated infections (HAI) through the STOP HAI campaign and RCA initiatives. Analyses of the effectiveness of contact precautions to reduce transmission of methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE) have been presented nationally and are part of a multi-pronged effort with research and analytics collaborators to reduce transmission of these pathogens. The team strives for innovation in areas such as identifying areas at high risk for *C. difficile* transmission, deployment of ultraviolet disinfection for reduction of transmission in the environment, and using electronic tools to improve HAI-reduction process measures. The UPMC Presbyterian IP&C team are important leaders in system-wide IP&C efforts, particularly in response to SARS-CoV-2, the most impactful pandemic of a generation.
- **Education: Drs. Snyder** and **Martin** have developed a curriculum for the training of Infectious Diseases fellows that is already being mimicked at other academic medical centers and lays the groundwork for a training program in hospital epidemiology. Supported by the entire IP&C team, this training is being adapted for the training of Infectious Diseases faculty and future Infection Preventionists.
- **Research:** A burgeoning and rejuvenated research program is tackling multiple operational challenges in Infection Prevention, including optimal deployment of contact precautions for MRSA and VRE, effective use of UV disinfection, the role of electronic decision support in reducing *C. difficile* HAI and inappropriate antimicrobial therapy, and development of a centralized surveillance program, as well as in partnership with the Microbial Genomic Epidemiology Laboratory in using whole genome sequencing to improve infection cluster detection and prevention.

VA Pittsburgh Healthcare System (VAPHS)

ID services provided by our faculty at the VA Pittsburgh Healthcare System (VAPHS), University Drive, include general and solid organ transplant in-patient consultations (>200 consults per month), and outpatient General ID, Transplant ID and HIV-AIDS clinics (>35 patients per week). The volume of in-patient consults has more than doubled in the past three years. General ID consultations are also provided at the H. J. Heinz Progressive Care Center (~20 consults per month). In addition to consultations on cases requested by specific services, the ID service provides real-time surveillance and guidance on all positive blood cultures and cases of pneumonia. The ID division administers a home IV antibiotic program that services veterans in a 4-state catchment area, an Antimicrobial Stewardship Program, and a home antibiotics program. **Brooke Decker, MD**, and **Deanna Buehrle, PharmD**, direct the stewardship program, and Dr. Buehrle was awarded one of four national VA stewardship innovation awards for a program on outpatient antimicrobial management. The Infection Prevention Program is administered by the ID division and is directed by **Dr. Decker**. Dr. Decker and her Infection Prevention team have reduced rates of *Clostridium difficile* infection, and maintained comprehensive water management and pathogen remediation protocols. The ID division has initiated a telemedicine consultation service, which provides services to VA clinics in the

VISN outside of Pittsburgh and in the homes of patients.

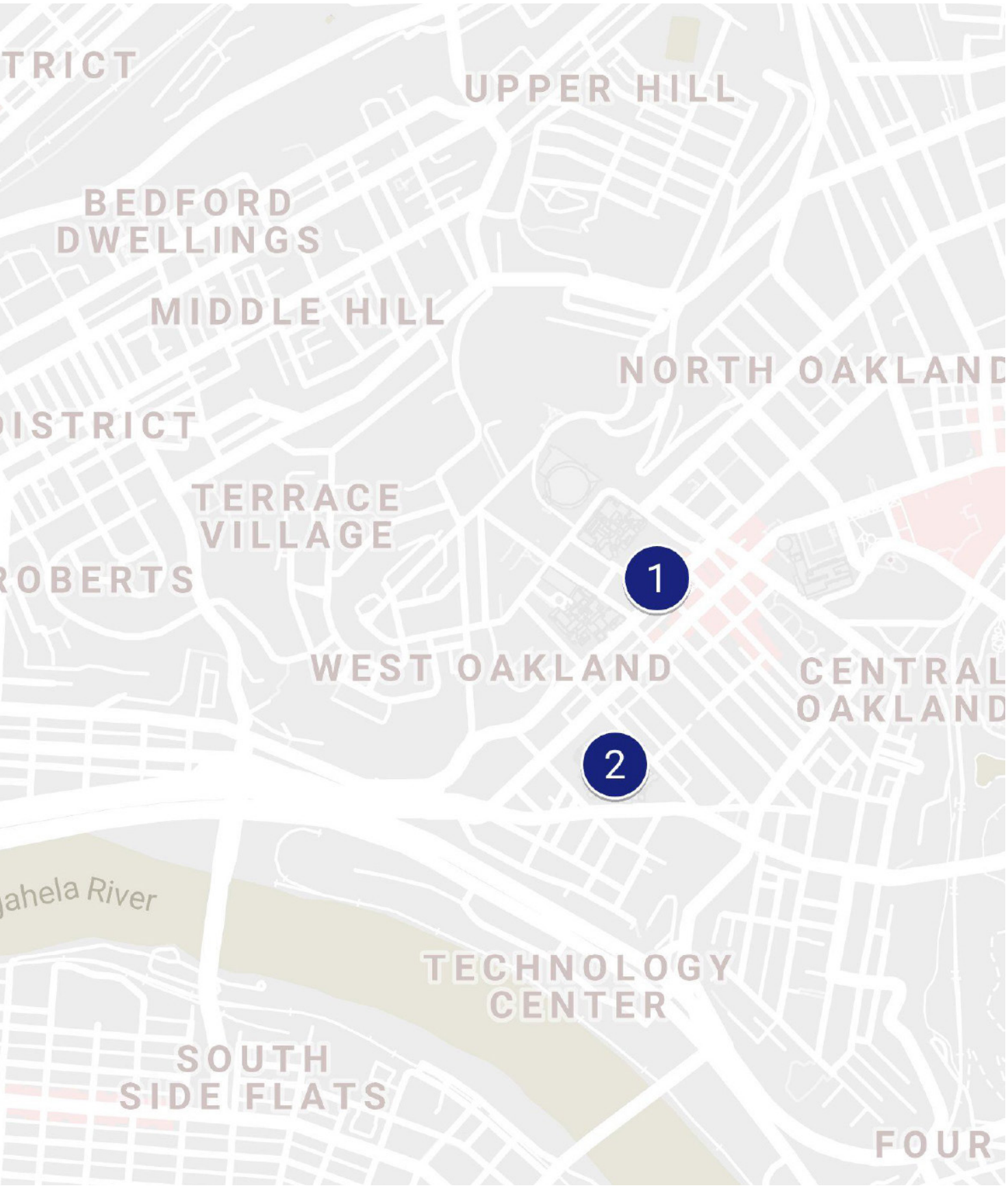
CLINICAL
LOCATIONS



1. **Center for Care of Infectious Diseases (CCID)**
   Falk Medical Building
   3601 Fifth Avenue, Suite 700
   Pittsburgh (Oakland), PA 15213

2. **Division of Infectious Diseases—Magee-Womens Hospital of UPMC**
   300 Halket Street, Tan Unit
   Pittsburgh (Oakland), PA 15213

3. **Division of Infectious Diseases—UPMC Mercy**
   1515 Locust Street, Suite 236
   Pittsburgh, PA 15219


TRICT
UPPER HILL
BEDFORD
DWELLINGS
MIDDLE HILL
NORTH OAKLAND
ISTRICT
TERRACE
VILLAGE
ROBERTS
1
WEST OAKLAND
CENTRAL
OAKLAND
2
ahela River
TECHNOLOGY
CENTER
SOUTH
SIDE FLATS
FOUR

RESEARCH
ACTIVITIES

A vital activity of the ID division is laboratory, translational, and clinical research. Major research strengths of the division are in HIV-AIDS, TID, antimicrobial resistance, and nosocomial and community-acquired infections.

Research Centers

Research activities are concentrated in three world-class Centers of Excellence in Research:

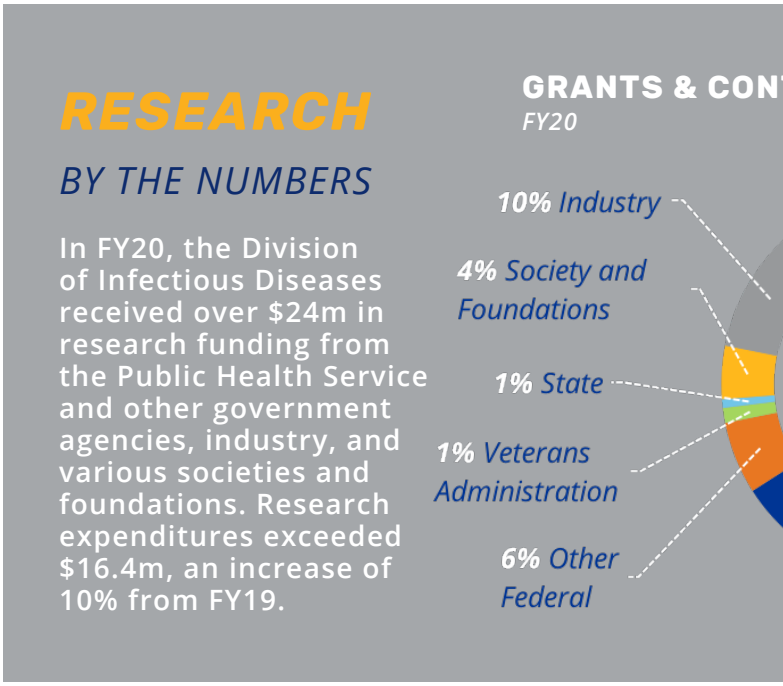
Our **Center for Antibody Therapeutics (CAT)** identifies, characterizes and engineers novel human monoclonal antibodies (mABs) as candidate therapeutics as well as develops novel strategies to increase their safety and efficacy against viruses, cancer and other diseases as well as aging. Its overall mission is to develop safe and effective therapeutics for unmet medical needs. CAT also develops new methodologies to improve safety and efficacy of candidate therapeutics as full size antibodies (mostly IgG1), antibody domains, Chimeric Antigen Receptors (CARs), antibody-drug conjugates (ADCs), bispecific and multispecific antibodies including bispecific T cell engagers (BiTEs) and bispecific killer cell engagers (BiKEs) as well as trispecific variants (TriKEs).

During the period from July 1, 2019 to June 30, 2020, CAT identified and characterized a number of binders to SARS-CoV-2 in three different formats as well as to cancer-related protein targets. CAT published 10 articles, filed 9 invention disclosures one of which was filed as a provisional and non-provisional patent application and licensed to a company. Notably, CAT was the first in the world to identify exceptionally potent human antibodies against SARS-CoV-2 as tested in three different animal models. Several new grant proposals were submitted, and with the ongoing ones there are a total of four active in addition to the three funded by UPMC. More than 10 oral presentations were given at the University of Pittsburgh, national and international meetings. One spinoff company, Abound Bio, started to function in 2020.

Our **Center for Innovative Antimicrobial Therapy (CIAT)** investigates novel approaches to combat the growing problem of antimicrobial resistance. CIAT's areas of research include genetic and molecular basis of emerging antimicrobial resistance mechanisms; the rapid diagnosis of resistance utilizing phenotypic, genetic and lipidomic approaches; discovery of therapeutics using peptides, small-molecule inhibitors and bacteriophages; and implementation of pharmacokinetic and clinical studies to directly improve patient care.

RESEARCH
BY THE NUMBERS

In FY20, the Division of Infectious Diseases received over $24m in research funding from the Public Health Service and other government agencies, industry, and various societies and foundations. Research expenditures exceeded $16.4m, an increase of 10% from FY19.

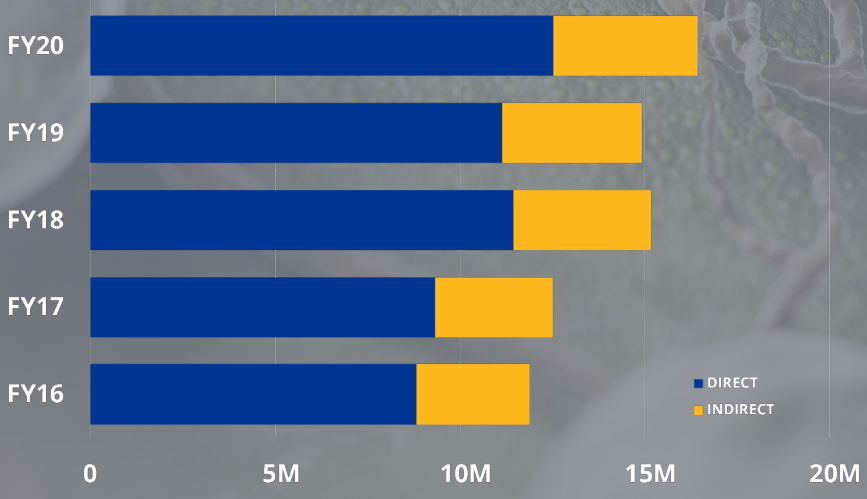


TRACTS AWARDED

78% Public Health Service

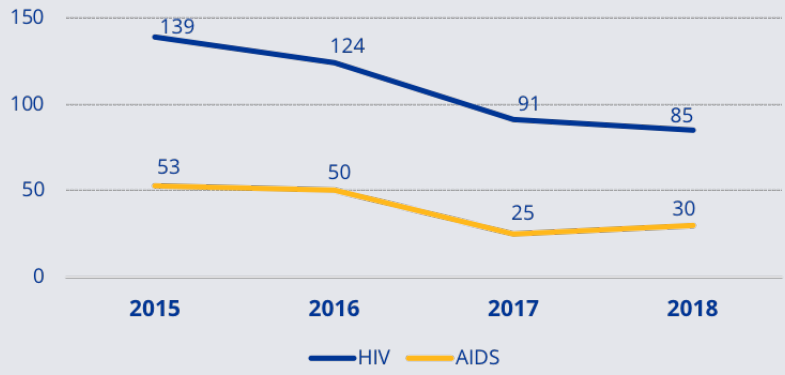
RESEARCH EXPENDITURES

FY16-FY20

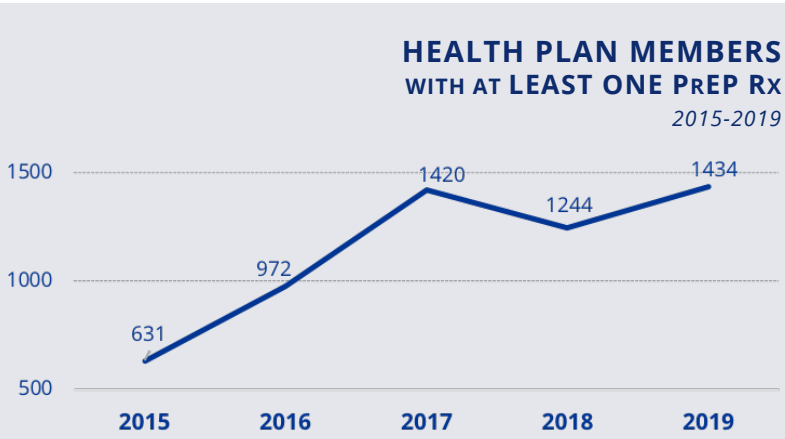


Our **Center for AIDS Elimination (CAE)** provides clinical, educational, and scientific research for the purposes of prevention, treatment and cure of HIV/AIDS. Through the combined efforts of innovative laboratory methods, cutting-edge translational research, patient care, public health programs and community outreach, the CAE is diligently working toward the goal of finding better HIV therapeutics and treatment, a functional cure for HIV, and ending the HIV-AIDS epidemic.

As an example, AIDS Free Pittsburgh was launched in 2016 as a local collaborative effort among health care providers and community organizations to reduce new cases of HIV infection by 75%, and eliminate AIDS diagnoses by 2020 in Allegheny County (http://www.aidsfreepittsburgh.org/index.php). As shown in the graphic below, the incidence of HIV infection and AIDS diagnoses has declined steadily toward the 2020 goals of AIDS Free Pittsburgh. Preliminary epidemiologic data indicates a small increase in new HIV diagnoses from 2018 to 2019, still pending confirmation from PA DOH. PrEP awareness and PreP uptake has improved.



Source: 2018 Annual HIV Surveillance Summary, Bureau of Epidemiology, Pennsylvania Department of Health



Source: AIDS Free Pittsburgh PrEP Survey and Custom Data Request from Area Health Plans

Research Grants and Activities

The division's research portfolio includes awards from the National Institutes of Health (NIH), Centers for Disease Control and Prevention (CDC), Health Resources and Services Administration (HRSA), United States Agency for International Development (USAID), foundations, and industry sponsors. The division also conducts numerous UPMC clinical trials. Strong research themes in the division include HIV-AIDS, epidemiology and molecular epidemiology of bacterial pathogens, antimicrobial resistance of gram-negative bacteria, pathogenesis of fungal infections, and biosecurity planning.

New Research Initiatives and Ongoing and Planned Collaborations

- **Cornelius Clancy, MD**, received a 20-month Centre Hospitalier Universitaire Vaudois contract for the study titled "T2MR study in SICU patients at high risk for intra-abdominal candidiasis" (2018-2020)
- **Cornelius Clancy, MD**, received a two-year NIH R21 award for the project titled "Mechanisms of ceftazidime-avibactam susceptibility and resistance among Enterobacteriaceae expressing variant KPCs" (2018-2020)
- **Cornelius Clancy, MD**, received a one-year T2 Biosystems, Inc. award for the project titled "Impact of protocol-driven T2Bacteria testing on antimicrobial usage and outcomes of liv-

er and kidney transplant recipients" (2019-2020)

- **Cornelius Clancy, MD**, received a two-year NIH R21 award for the project titled "Mechanisms of ceftazidime-avibactam susceptibility and resistance among Enterobacteriaceae expressing variant KPCs" (2018-2020)
- **Cornelius Clancy, MD**, received a two-year NIH R21 award for the project titled "Candida albicans regulatory pathways contributing to intra-abdominal candidiasis" (2019-2021)
- **Cornelius Clancy, MD**, received a two year grant from Merck Sharp & Dohme, Corp. for the project titled "Real-world use of Fidaxomicin for treatment of Clostridium difficile infection" (2019-2021)
- **Dimiter Dimitrov, PhD**, received a two-year NIH R21 subaward for the project titled "FGFR4-CAR-based Immunotherapy of Fusion-Positive Rhabdomyosarcoma" (2019-2021)
- **Dimiter Dimitrov, PhD**, received a two-year St. Baldrick's Foundation subaward for the project titled "Novel Approaches to Targeting Ewing Sarcoma" (2020-2022)
- **Yohei Doi, MD, PhD**, received a three-year NIH subaccount in collaboration with Dr. Berthony Deslouches in the Graduate School of Public Health for the study titled "Determinants and Mechanisms of Efficacy of Peptide Antibiotics as Novel Sepsis Therapy" (2018-2021)
- **Yohei Doi, MD, PhD**, and **Ryan Shields, PharmD, MS**, received a one-year NIH subcontract with Duke University for the study titled "ARGL-FOCUS" (2018-2019)
- **Yohei Doi, MD, PhD**, received a two-year Merck Sharp & Dohme, Corp. subaccount for the study titled "Assessment of Otopathogens in Young Children with Acute Otitis Media" with PI Alejandro Hoberman in the Department of Pediatrics (2019-2021)
- **Yohei Doi, MD, PhD**, received a two-year NIH award for the project titled "Mechanisms of cefiderocol resistance" (2020-2022)
- **Yohei Doi, MD, PhD**, received a five-year NIH R01 renewal for the project titled "Colistin resistance in extensively drug-resistant Gram-negative pathogens" (2020-2025)
- **Yohei Doi, MD, PhD**, received a five-year NIH subaccount in collaboration with Dr. Nader Shaikh in the Department of Pediatrics for the study titled "Biomarkers for Urinary Tract Infections and Pyelonephritis" (2019-2023)
- **Ghady Haidar, MD**, received a two-year NIH subcontract with Johns Hopkins University for the project titled "Prospective observational study of HIV+ deceased donor liver transplant for HIV+ recipients" (2019-2020).
- **Ghady Haidar, MD**, received a five-year NIH subcontract with The Washington University in St. Louis for the project titled "Metagenomic shotgun microbial sequencing in post-transplant lymphoproliferative disorders (PTLD-MSMS)" (2019-2024)
- **Lee Harrison, MD**, and **Nicolas Sluis-Cremer, PhD**, received a five-year NIH T32 award for the project titled "University of Pittsburgh Training Program in Antimicrobial Resistance" (2019-2024)
- **Lee Harrison, MD**, received a four-year subaccount for his role as Co-I for the project titled "Analyzing Adult Pneumococcal Vaccination Implementation in the Underserved" in collaboration with PI **Kenneth Smith, MD**, Professor of Medicine and Clinical and Translational Science (2020-2024)
- The ID division's **HIV Program** was awarded Coronavirus Aid, Relief, and Economic Security (CARES) Act funding for one year through the Ryan White Project (2020-2021)
- **Ken Ho, MD, MPH**, received a seven-year NIH U01 subaccount for his role as Clinical Director for a project titled "University of Pittsburgh MACS/WIHS CCS" with PI Charles Rinaldo, PhD, Professor and Chair of Infectious Diseases and Microbiology in the Graduate School of Public Health (2019-2026)

- **Ken Ho, MD, MPH**, received a one-year NIH R01 subaccount from Magee Womens Research Institute and Foundation for a project titled "Development of a Urine-based point-of-care test for adherence to antiretroviral drugs," under PI **Rhonda Brand, PhD** (2018-2019)
- **Ken Ho, MD, MPH**, received a two-year Allegheny-Singer Research Institute award for the project titled "A Test of Scalable Behavioral Interventions to Increase PrEP Adherence: Value Affirmation and Future Selves" (2019-2021)
- **Jana Jacobs, PhD,** received a one-year pilot grant from the Clinical and Translational Science Institute, University of Pittsburgh, and the DSF Charitable Foundation titled "SARS CoV2 Immune Escape Variants in Treatment" (2020-2021)
- **Bernard Macatangay, MD**, was awarded a four-year NIH R01 in collaboration with **Sanjay Patel, MD, MS,** in the Division of Pulmonary, Allergy and Critical Care Medicine for a project titled "Impact of Poor Sleep on Inflammation and the Adenosine Signaling Pathway in HIV Infection" (2018-2022)
- **Bernard Macatangay, MD,** received a seven-year NIH U01 subaccount for his role as Co-Investigator for a project titled "University of Pittsburgh MACS/WIHS CCS" with PI Charles Rinaldo, PhD, Professor and Chair of Infectious Diseases and Microbiology in the Graduate School of Public Health (2019-2026)
- **Jane Marsh, PhD,** was awarded a one-year CDC sub-contract in collaboration with Johns Hopkins University for the project titled "Maryland Emerging Infectious Program (ABC Training)" with total costs of $214,316 from January 1, 2019 through December 31, 2019.
- **Jane Marsh, PhD**, was awarded a one-year CDC sub-contract in collaboration with Johns Hopkins University for the project titled "Maryland Emerging Infectious Program (ABC Training)" (2020)
- **John Mellors, MD,** received a six-month supplemental subaward from NIH via the "AIDS Clinical Trials Group/UCLA Leadership and Operations Center" (2019-2020)
- **John Mellors, MD**, received a six-month supplemental award from NIH via the "Pitt-Ohio State Clinical Trials Unit" (2020)
- **Minh-Hong Nguyen, MD**, and Rachel Marini, PharmD, received a two-year grant from Merck Sharp & Dohme, Corp. for the project titled "CMV infections among organ transplant patients: Efficacy and adverse events of valganciclovir prophylaxis, and risk factors for ganciclovir-resistant virus" (2018-2020)
- **Minh-Hong Nguyen, MD**, received a one-year grant from Scynexis, Inc. for the study titled "In vitro activity of Ibrexafungerp (SCY-078) alone and in combination with anti-mould azole against clinical isolates of Aspergillus species recovered from lung transplant patients with prior exposure to azole therapy" (2019 -2020)
- **Minh-Hong Nguyen, MD**, received a two-year NIH award for the period titled "Invasive aspergillosis complicating severe influenza" (2020-2022)
- **Minh-Hong Nguyen, MD**, and **Ryan Bariola, MD**, received a one-year grant from Merck Sharp & Dohme, Corp. for the study titled "A retrospective evaluation of fidaxomicin use at UPMC community hospitals" (2019-2020)
- **Minh-Hong Nguyen, MD**, received a one-year grant from Pulmocide Limited for the study titled "CLSI Broth microdilution study" (2019-2020)
- **Minh-Hong Nguyen, MD**, received a two-year grant from Pattern Bioscience, Inc. for the study titled "BAL Specimens" (2020 -2022)
- **Sharon Riddler, MD**, received a five-year NIH award for the project titled Native-like Envelope Trimer Therapeutic Vaccination for Induction of Broadly Neutralizing Antibodies to Facilitate HIV Functional Cure" (2020-2025)
- **Sharon Riddler, MD**, received an FHI 360 award for the project titled "COVID-19 Prevention

Network (CoVPN Trial)" (2020)

- **Sharon Riddler, MD**, received a University of California, Los Angeles (UCLA) award for the project titled "COVID-19 A5401" (2020)
- **Ryan Shields, PharmD, MS**, received a one-year grant from Shionogi & Co. Ltd. for the project titled "In vitro activity of cefiderocol against multiply- (MDR) and extensively- (XDR) drug resistant Pseudomonas aeruginosa clinical isolates" (2018-2019)
- **Ryan Shields, PharmD, MS**, received a one-year grant from Tetraphase Pharma for the project titled "In vitro activity of eravacycline against carbapenem-resistant Enterobacteriaceae (CRE) isolates demonstrating resistance to ceftazidime-avibactam" (2019)
- **Ryan Shields, PharmD, MS**, received a 6-month award from International Health Management Associates, Inc. for the study titled "Shionogi US Surveillance Program" (2019)
- **Ryan Shields, PharmD, MS**, was awarded a two-year NIH R03 grant for the project titled "Characterization and suppression of resistance to new CRE agents" (2019-2021)
- **Ryan Shields, PharmD, MS**, received a two-year grant from Merck Sharpe & Dohme, Corp. for the project titled "Clinical manifestations, healthcare utilization, and financial burden of CRE infections" (2019-2021)
- **Fernanda Silveira, MD, MS**, received a one-year NIH COVID supplement subaccount with Dr. Richard Zimmerman in the Division of Family Medicine for the project titled "COVID-19 Supplement - Flu Vaccine Effectiveness in those Hospitalized in a Large Diverse Health System" (2020-2021)
- **Nicolas Sluis-Cremer, PhD**, received a one-year NIH R56 award for the project titled "The HIV Reservoir in Naïve CD4+ T Cells" (2018-2019)
- **Nicolas Sluis-Cremer, PhD**, received a seven-year NIH U01 subaccount in collaboration with Dr. Charles Rinaldo in the Department of Infectious Diseases and Microbiology in the Graduate School of Public Health for the project titled "University of Pittsburgh MACS-WIHS CCS" (2019-2026)
- **Daria Van Tyne, PhD**, received a three-year NIH R00 award for the project titled "Bacterial Evasion of Innate Defenses at the Ocular Surface" (2019-2021)
- **Daria Van Tyne, PhD**, received a one year NIH subcontract with Duke University for the project titled "ARLG – Isolation and characterization of lytic phages that target MDR bacteria" with total costs of $78,250 for the period December 2, 2019 through November 30,2020.
- **Daria Van Tyne, PhD**, received a two-year grant from the U.S. Civilian Research & Development Foundation (CRDF Global) for her project titled "Evolution of Extended-Spectrum Beta-Lactamase-Producing Enterobacteriaceae in the US and Japan Over the Past Two Decades" (2019-2021)
- **Daria Van Tyne, PhD**, received a two-year subaccount in collaboration with Dr. Jennifer Bomberger, PhD, Microbiology and Molecular Genetics, for her project titled "Pitt CF Research Development Program" (2019-2021)
- **Daria Van Tyne, PhD**, received a one-year award from the Competitive Medical Research Fund for her project titled "Dynamics of Mobile Genetic Element Sharing among Multi-Drug Resistant Bacterial Pathogens in a Hospital Setting" (2019-2020)
- **Mohamed Yassin, MD, PhD**, received a one-year NIH COVID supplement subaccount with Dr. Linda Frank in the Graduate School of Public Health for the project titled "AETC COVID 19 Response" (2020-2021)

Faculty Research Interests and Activities

John W. Mellors, MD *Division Chief*

Dr. Mellors led several studies with samples from the multicenter AIDS cohort study (MACS) that established the critical relationship between plasma viremia (HIV-1 RNA) and HIV disease progression to AIDS and death in both acute and chronic HIV-1 infection. This work led to the universal use of plasma HIV-1 RNA and CD4+T-cell counts to estimate prognosis in HIV-1 infection and the optimal time to initiate antiretroviral therapy (ART). Dr. Mellors also contributed to the development and testing of the first antiretroviral combinations that produced sustained suppression of viremia and recovery of CD4+T-cells that launched the current era of highly-effective ART.

Presently, Dr. Mellors's laboratory focuses on resistance to antiretroviral drugs used for treatment and HIV prevention and on mechanisms of HIV persistence and strategies to deplete the reservoirs that are the barrier to curing HIV infection. His work on HIV reservoirs showed that low-level viremia persists in most individuals on long-term suppressive ART, and that the level of residual viremia is predicted by the level of viremia before ART. Current work focuses on identifying agents to reverse HIV latency and to eliminate HIV infected cells. The impact of innovative therapies on HIV reservoirs is being studied in Phase I/II trials of histone deacetylase inhibitors, monoclonal antibodies to immune checkpoint ligands, monoclonal antibodies to HIV envelope glycoproteins, and TLR agonists.

Advisory Committee Memberships and Leadership Positions

- Member, Scientific Committee, Conference on Retroviruses and Opportunistic Infections, 1994-present
- Co-Chair, International Workshop on HIV Drug Resistance and Combination Therapies, 1996-present
- Member, Organizing Committee, International Workshop on HIV Drug Resistance and Combination Therapies, 1996-present
- Consultant, Center for Biologics Evaluation and Research, Food and Drug Administration, 1997-present
- Organizer, Symposium on Antiviral Drug Resistance, 2000-present
- Member, Executive Committee and Central Laboratory Committee, NIH-sponsored Microbicide Trials Network (MTN), and MTN Director of Virology, 2006-present
- Member, H1N1 Influenza Task Force, 2009-present
- Member, Scientific Committee, International AIDS Society Towards a Cure, 2011-present
- Member, Past Chair, AIDS Clinical Trials Group Network's HIV Reservoirs and Viral Eradication Transformative Science Group, 2011-present
- Member, Scientific Program Committee, International Microbicides Conference, 2012-present
- Member, Scientific Committee, HIV Persistence Workshop, 2014-present
- CTU PI/CRS Leader At-Large, Executive Committee, AIDS Clinical Trials Group, 2017-present
- External Review Group Member for HIV Drug Resistance (HIVDR), World Health Organization, 2017-present
- Steering Group Member for Clinical and Research Global Action Plan for HIVDR, World Health Organization, 2019-present

Editorships

- Editor, HIV Database, Los Alamos National Laboratory, 1995-present

Rima Abdel-Massih, MD

Dr. Abdel-Massih's research interests include infectious complications in transplant recipients, cytomegalorius, fungal infections, and bacterial resistance. A co-investigator on multiple clinical trials, she also has a special interest in telehealth models of care applied in the infectious diseases spe-

cialty.

Advisory Committee Memberships and Leadership Positions

- Member, Antimicrobial Management Program, UPMC, 2009-present
- Member, Internal Medicine Residency Application Interviewing Committee, University of Pittsburgh Medical Center, 2010-present
- Member, ID Educational Initiative Workgroup, American Society of Transplantation, 2011-present
- Member, Program Directors Community, Infectious Diseases Society of America, 2016-present
- Member, Telehealth and Telemedicine Workgroup, IDSA, 2017-present

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2007-present
- Member, American Society of Transplantation, 2008-present
- Member, Association of Program Directors of Internal Medicine, 2016-present
- Member, International Immunocompromised Host Society, 2018-present

Editorships

- Ad hoc Reviewer, *Transplant Infectious Diseases,* 2009-present

Honors and Awards

- Award for Commitment and Excellence in Services (ACES), University of Pittsburgh Medical Center, Pittsburgh, PA, 2019

Cristian Apetrei, MD, PhD

Dr. Apetrei's laboratory uses nonhuman primate models to address issues of SIV diversity and pathogenesis in natural hosts and upon cross-species transmission with the overriding philosophy that every aspect of HIV research can and should be modeled in appropriate animal models in order to understand the basic mechanisms that underlie disease processes and implement therapeutic approaches to control the deleterious consequences of HIV infection. Dr. Apetrei pioneered SIV pathogenesis in the wild and was actively involved during the last decades in modeling different aspects of HIV pathogenesis in nonhuman primate hosts. The current focus of his research is to assess the role of the gut dysfunction in the pathogenesis of HIV infection and to elaborate strategies to counter it in nonhuman primate models through multiple approaches. The lab is also involved in testing multiple approaches for cure research: virus reactivation with romidepsin, improvement of virus control and reactivation through regulatory T cells and the role of autovaccination in boosting an effective immune response that might lead to a functional cure of HIV. Dr. Apetrei is also involved in collaborative studies testing strategies to control chronic immune activation and prevent comorbidities in HIV-infected patients.

Study Sections

- HIV/SIV emphasis panels, NIH, November and December 2019
- SARS-CoV-2 emphasis panel, NIH, June 2020
- Horisons 2020 study section, Bruxelles, European Union, July 2019
- Standing member (Fundamental science) and emergency study section on COVID science, CSS11-Agence Française pour la Recherche sur le SIDA (ANRS), 2019-present

Professional Affiliations and Society Memberships

- Member, American Society for Microbiology, 2002-present
- Member, American Society for Clinical Investigation, 2014-present
- Member, Association of American Immunologists, 2014-present

Editorships

Photo
Dr. Apetrei recently joined the Division of Infectious Diseases after serving as faculty in the Department of Pathology

- Editorship, HIV Sequence Database, 2010-present
- Editorship, *Journal of Medical Primatology*, 2010-present
- Editor, *PLOS One*, 2012-present
- Editorial Board, *Journal of Virology*, 2017-present

Ricardo Arbulu, MD

Dr. Arbulu is interested in low-cost, highly-reproducible practice improvement interventions to support antibiotic decisions. He is currently evaluating the impact of an institutional structured intervention to stratify patients previously labeled as penicillin allergic with respect to their safety to receive beta-lactam antibiotics. The outcome measures include the appropriateness of antibiotics prescribed, drug-related adverse events and cost savings.

Professional Affiliations and Society Memberships

- Member, American College of Physicians, 2006-present
- Member, Infectious Diseases Society of America, 2009-present
- Member, Society for Healthcare Epidemiology of America, 2017-present

Hassan Badrane, PhD

Dr. Badrane is investigating opportunistic infections caused by Candida species of yeasts, particularly *C. albicans*. He is characterizing genes where expression has been found to be induced in vivo and their encoded protein have an immunogenic property. Presumably, these genes will be important during infection. Among them, he characterized IRS4 to encode for an Eps15 homology (EH) domain protein, which regulates the levels of phosphatidylinositol (4,5)-bisphosphate (PI(4,5) P2). This regulation is exerted by activating Inp51p, a 5-phosphatase enzyme that converts PI(4,5) P2 to PI4P. Indeed, mutant strains in which either IRS4 or INP51 has been knocked-out had higher levels of PI(4,5)P2, which in turn affected the cell wall integrity pathway and hyphal growth, and attenuated virulence to mice in a disseminated candidiasis model. In addition, these mutant strains exhibited abnormal intracellular patches of PI(4,5)P2 that colocalized with septins. Currently, he is deciphering the upstream regulation that controls the function of Irs4p/Inp51p as well as setpins.

J. Ryan Bariola, MD

Dr. Bariola's interests include improved use of antimicrobials for hospitalized patients, as well as the use of rapid diagnostics to improve the detection and timely management of infections. He also has interests in the area of endemic fungal infections, particularly blastomycosis.

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2005-present
- Member, Society for Healthcare Epidemiology of America, 2015-present

Honors and Awards

- Honoree, Best Doctors, *Pittsburgh Magazine*, 2019-2020

Tatiana Bogdanovich, MD, PhD, MSc

Dr. Bogdanovich's research interests are focused on the prevention and treatment of infections in solid organ transplant recipients as well as stem cell transplant recipients. Her other main area of research interest is clinical and microbiologic efficacy of the fecal microbiota transplantation (FMT) for recurrent *Clostridioides difficile* infections (rCDI). She is leading the FMT laboratory and has been enrolling patients in the registry of FMT for rCDI. She is also involved in the clinical trials of experimental treatments for rCDI (Ser-109 and ridinilazole).

Advisory Committee Memberships and Leadership Positions

- Member, Antimicrobial Management Program, UPMC, 2012-present
- Member, C. Difficile Reduction Committee, 2016-present

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2009-present
- Member, Center for Innovative Antimicrobial Therapy, 2016-present

Karin E. Byers, MD, MS

Dr. Byers's major areas of interest are orthopedic and neurosurgical infections. She is also interested in preventing adverse outcomes from antibiotics.

Advisory Committee Memberships and Leadership Positions

- Member, Antibiotic Approval Committee, UPMC, 2002-present
- Member, Clinical Directors' Council, UPMC, 2012-present
- Member, Clinical Competence Committee (Infectious Diseases), University of Pittsburgh School of Medicine, 2013-present
- Member, Pharmacy and Therapeutics Subcommittee, UPMC, 2014-present

Professional Affiliations and Society Memberships

- Associate Member, American College of Physicians, 1991-present
- Member, American Medical Association, 1991-present
- Fellow, Society for Healthcare Epidemiology of America, 1997-present
- Member, Infectious Diseases Society of America, 1997-present
- Member, American Society of Microbiology, 1997-present
- Member, Musculoskeletal Infections Society, 1997-present

Honors and Awards

- Honoree, Best Doctors, *Pittsburgh Magazine*, 2016-2019
- Best Doctor, Best Doctors in America, 2016-present

Shao Ji Cheng, MD, PhD

Dr. Cheng's research interests are the pathogenesis of Candida infection and the Enterobacter infection, as well as the mechanisms of antifungal drug resistance.

Professional Affiliations and Society Memberships

- Member, American Society of Microbiology, 2016-present

Madhu C. Choudhary, MD

Dr. Choudhary is most interested in HIV/AIDS treatment and HIV prevention. She is also engaged in clinical trials of new agents for the treatment of hepatitis B and C and in clinical trials for HIV co-infected.

Advisory Committee Memberships and Leadership Positions

- Clinical Investigator At-Large for the Data Management Committee, AIDS Clinical Trials Group (ACTG), 2019-present

Cornelius (Neil) J. Clancy, MD

Dr. Clancy's laboratories are interested in the molecular pathogenesis of invasive infections caused by the fungus *Candida albicans* and multi-drug resistant Gram-negative bacteria. Dr. Clancy's labs have implicated several novel *Candida albicans* and *Klebsiella pneumoniae* genes that contribute to the pathogenesis of invasive infections. Biological processes related to these genes that are studied in the lab include histone methylation and transcriptional regulation, DNA damage responses, and phosphoinositide regulation.

In addition, he and Dr. Nguyen collaborate on research about mechanisms of antimicrobial resistance in bacteria and fungi and their clinical relevance.

Study Sections

- Member, NIH ZRG1 IDM S (81) Study Section AREA (R15): Infectious Diseases, Microbiology and Drug Discovery, 2014-present

Advisory Committee Memberships and Leadership Positions

- Member, Interviewing Committee, Internal Medicine Residency and Infectious Diseases Fellowship Program, University of Pittsburgh, 2007-present
- Member, Academic Committee, Infectious Diseases Division Fellowship Program, University of Pittsburgh, 2007-present
- Member, Research and Development Committee, VA Pittsburgh Healthcare System, 2008-present
- Director, Antimicrobial Stewardship Program, VA Pittsburgh Healthcare System, 2014-present
- Director, Infection Control and Prevention, VA Pittsburgh Healthcare System, 2014-present
- Member, Water Safety Committee, VA Pittsburgh Healthcare System, 2014-present
- Member, Pneumonia Committee, VA Pittsburgh Healthcare System, 2014-present
- Member, Program Committee, The Microbiology Society (UK) Candida and Candidiasis, 2020
- Member, Program Committee, American Society for Microbiology Microbe, 2020-2023

Editorships

- Ad hoc reviewer, *PLoS Pathogens*, 2004-present
- Ad hoc reviewer, *Clinical Infectious Diseases*, 2004-present
- Ad hoc reviewer, *Antimicrobial Agents and Chemotherapy*, 2004-present

Matthew J. Culyba, MD, PhD

Dr. Culyba's laboratory fuses molecular and biochemical methodologies with experimental microbial evolution to study mutational phenomena and bacterial adaptation. Mutation and gene transfer events are the source of heritable variation for evolution. These genome diversifying processes can range from being relatively site-specific in the genome to being nearly random. Furthermore, beyond the mutations themselves, the DNA damage and DNA repair events associated with mutagenesis can also be deleterious to the host and are subject to multiple levels of active regulation by cells. Understanding how microorganisms respond to their environments and control the rate and specificity of mutagenesis is the focus of the laboratory. Ongoing studies are aimed at elucidating the (i) molecular mechanisms which regulate mutational phenomena in bacteria during transitions to new environments, (ii) molecular specificity determinants of enzymes involved in mutational phenomena, and (iii) new methods for tracking and detecting mutations in populations of cells. Research projects in the lab are designed to inform a variety of pressing scientific challenges, including combating the crisis of antimicrobial resistance, improving the specificity and safety of cutting-edge gene editing technologies, and building a comprehensive model of molecular evolution.

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2013-present

Joshua C. Cyktor, PhD

Dr. Cyktor is an immunovirologist who specializes in the interface of intracellular pathogens, like HIV-1 and *Mycobacterium tuberculosis*, within the human immune system. Specifically, he is interested in understanding the mechanisms of HIV-1 persistence in patients despite years of suppressive treatment. He is a protocol virologist for several AIDS Clinical Trials Group studies that are at the forefront of translational HIV-1 clinical research and is the Associate Director of the Pitt Virology Specialty Laboratory.

Advisory Committee Memberships and Leadership Positions

- Member, Inflammation and End-Organ Disease Transformative Science Group, AIDS Clinical Trials Group (ACTG), 2017-present
- Leader, A5321 Virology Working Group, AIDS Clinical Trials Group (ACTG), 2018-present

Brooke K. Decker, MD

As Director of Infection Prevention at VA Pittsburgh Healthcare System, Dr. Decker is most interested in the epidemiology of hospitalassociated infections, transmission of resistant organisms, and prevention of hospital waterborne infections, including Legionnaire's Disease.

Professional Affiliations and Society Memberships

- Member, Society for Healthcare Epidemiology of America, 2019-present
- Member, American Thoracic Society, 2019-present
- Member, Society of Critical Care Medicine, 2019-present
- Member, WMS, 2019-present
- Member, Infectious Diseases Society of America, 2019-present
- Member, American Society of Microbiology, 2019-present

Dimiter S. Dimitrov, PhD

Dr. Dimitrov focuses his research on identifying, engineering, and characterizing human monoclonal antibodies as candidate therapeutics against cancer, viruses, and aging. He is developing new methodologies to improve safety and efficacy of candidate therapeutics as full-size antibodies (mostly IgG1), antibody domains, Chimeric Antigen Receptors (CARs), antibody-drug conjugates (ADCs), bispecific and multispecific antibodies including bispecific T cell engagers (BiTEs), and bispecific killer cell engagers (BiKEs), as well as trispecific variants (TtiKEs).

Advisory Committee Memberships and Leadership Positions

- Advisory Committee, Antibody Interest Group, NIH, 2010-present
- Member, Board of Distinguished Advisors, The Antibody Society, 2010-present
- Member, Scientific Advisory Board, Fred Hutchinson Program on AIDS Vaccine, 2013-2019
- Member, International Scientific Advisory Board, Institute of Medical Microbiology, Fudan University, 2013-present

Editorships

- Editorial Board, *Journal of Virology*, 2007-present
- Founding Member, Editorial Board, *mAbs*, 2008-present
- Editorial Board, *The Open Virology*, 2008-present
- Editorial Board, *Journal of Bionanoscience*, 2009-present
- Editorial Board, *Antibodies*, 2011-present
- Editor, *PLOS One*, 2012-present
- Associate Editor, *Virologica Sinica*, 2013-present
- Editorial Board, *Journal of Cancer Research and Therapeutic Oncology*, 2013-present
- Editorial Board, *Expert Review of Precision Medicine and Drug Development*, 2017-present

Yohei Doi, MD, PhD

The mission of Dr. Doi's laboratory is to identify and investigate antimicrobial resistance of clinical concern among gram-negative bacterial pathogens. The areas of research include the genetic and molecular basis of emerging antimicrobial resistance mechanisms; the rapid diagnosis of resistance using phenotypic, genetic, and lipidomic approaches; and inhibitor-based drug discovery. Current efforts are focused on colistin resistance in *Acinetobacter baumannii*, a problematic healthcare-associated pathogen, and fosfomycin resistance in Escherichia coli, the predominant cause of urinary tract infection in both healthcare and community settings. The latter work has expanded into drug discovery effort aimed at reversing resistance using an inhibitor-based approach.

Advisory Committee Memberships and Leadership Positions

- Member, Institutional Review Board, University of Pittsburgh, 2010-present
- Member, DSMB, Clinical and Translational Science Institute, University of Pittsburgh, 2014-present

- Chair, Gram-Negative Subcommittee, Antimicrobial Resistance Leadership Group, National Institute of Allergy and Infectious Diseases, 2015-present

Editorships

- Ad hoc Reviewer, Multiple journals (*Critical Care Medicine, International Journal of Antimicrobial Agents, Infection Control and Hospital Epidemiology, PLoS One, Journal of Antimicrobial Chemotherapy, Antimicrobial Agents and Chemotherapy, Critical Care Medicine*), 2012-present
- Associate Editor, *Journal of Infection and Chemotherapy*, 2012-present
- Editorial Board, *Diagnostic Microbiology and Infectious Disease,* 2012-present
- Editor, *Antimicrobial Agents and Chemotherapy*, 2014-2019
- Ad hoc Reviewer, *Journal of Microbiology, Immunology and Infection*, 2014-present
- Editorial Board Member, *Journal of Clinical Microbiology*, 2015-present

Bonnie A. Falcione, PharmD

Dr. Falcione aims to identify strategies to prevent and treat infectious diseases in critically ill patients, as well as those at risk for critical illness due to the onset of infection or a complication of treating the infection, particularly those due to antimicrobial resistant organisms. She places particular emphasis on the use of available resources to improve empiric drug selection, dosing, and monitoring strategies for agents with high toxicity potential (vancomycin, colistin, aminoglycosides). She also seeks to identify concurrent drug therapies that may increase the risk of interfering with antimicrobial regimens in these critically ill patients or increasing the risk of critically ill patients developing an infection.

Dr. Falcione's research also centers on the prevention of infectious diseases and inappropriate antimicrobial use by increasing awareness of vaccine strategies, the best use of tools to identify the presence or absence of infections, and antimicrobial-use principles relevant to the individual patient.

Finally, she focuses on the development of teaching methods and strategies to educate pharmacy students and other healthcare professional trainees on optimal prevention and treatment strategies, including awareness of principles and strategies of antimicrobial stewardship.

Professional Affiliations and Society Memberships

- Member, Society of Infectious Diseases Pharmacists, 2004-present
- Member, American Association of Colleges of Pharmacy, 2005-present
- Member, Society of Critical Care Medicine, 2011-present
- Member, Allegheny County Pharmacists Association, 2013-present
- Member, Pennsylvania Pharmacists Association, 2013-present

Carolyn R. Fernandes, MD

Dr. Fernandes's research involves travel-related infections, tuberculosis, and infections due to *Staphylococcus aureus*.

Advisory Committee Memberships and Leadership Positions

- Member, ED/ICU/Medicine Committee, Magee-Womens Hospital of UPMC, 2013-present
- Member, Clinical Competency Committee, University of Pittsburgh School of Medicine, 2014-present

Honors and Awards

- Honoree, Best Doctors in America List, 2019-2020

Nupur Gupta, DO, MPH

Dr. Gupta serves as a clinical educator for medical students, residents, and fellows. She is interested in medical education for learners of all levels with an interest in Infectious Diseases. Clinically, she has a special interest in clinical HIV/AIDS. She actively sees HIV positive patients at PACT clinic and

also acts as their primary care provider. She is also involved in providing HIV/primary care through telemedicine to rural Pennsylvania sites. She is highly interested in reducing barriers to HIV care and thus using telemedicine as a tool to do so.

Advisory Committee Memberships and Leadership Positions

- Chair, Infectious Diseases Society of America Fellows' Subcommittee, Infectious Diseases Society of America, 2019-2020
- Member, Quality Management Committee, Infectious Diseases/HIV UPMC, 2019-present

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2017-present

Christiane M. Hadi, MD, MPH, MSc

Dr. Hadi is a clinician-educator with an interest in both General ID and HIV medicine. She plays an important role in our travel medicine clinic and, as a member of the North American Society of Refugee Health Providers, continues providing care for local refugees.

Advisory Committee Memberships and Leadership Positions

- Committee Member, CCID Quality Improvement Committee, February 2020-present

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2003-present
- Member, North American Society of Refugee Health Providers, 2014-present

Ghady Haidar, MD

Dr. Haidar's research focuses on transplant recipients. He has studied the clinical outcomes of extensively drug-resistant Gram-negative bacteria in the transplant setting, specifically novel beta-lactam/beta-lactamase-inhibitor combinations and mechanisms of microbial resistance to these agents. Dr. Haidar is also involved in clinical research in solid organ transplantation (SOT) recipients, via the American Society of Transplantation ID Community of Practice. He oversees HIV-to-HIV organ transplantation at UPMC as part of the multicenter HOPE trial, which seeks to determine the safety and efficacy of transplanting an HIV-infected organ into an HIV-infected recipient. Dr. Haidar has a special interest in immunotherapy and fecal microbiota transplantation for the management of infectious diseases.

Advisory Committee Memberships and Leadership Positions

- Member, HOPE (HIV-to-HIV Kidney Transplant), Publications Subcommittee, 2018-present

Professional Affiliations and Society Memberships

- Early Career Member-at-Large (elected), American Society of Transplantation (AST) Infectious Diseases Community of Practice (IDCOP), 2019-2020

Editorships

- Associate Editor, *Journal of Medical Virology* (COVID-19), 2020

Honors and Awards

- KL2 Scholar, University of Pittsburgh, 2020
- Faculty Teaching Award, Division of Infectious Diseases Fellowship Program, 2020

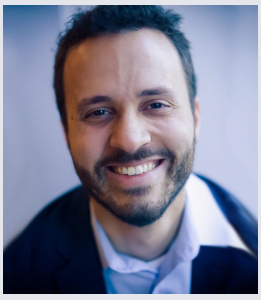


Photo
Dr. Haidar was named as a KL2 Scholar this year.

Elias K. Halvas, PhD

Dr. Halvas' researches the human immunodeficiency virus type 1 (HIV-1). Specifically, he focuses on the development, validation, and testing of new technologies to detect and quantify major- and low-frequency drug-resistant HIV-1 variants. He monitors HIV-1 drug-resistance and evolution by standard genotyping of patient samples, and he investigates the role of low-frequency HIV-1 drug-resistance variants on clinical outcomes. Dr. Halvas also dissects the mechanisms of HIV-1

pathogenesis, carcinogenesis, and persistence as related to HIV cure strategies.
Early in his career, Dr. Halvas's research dissected the structural determinants important for reverse transcriptase fidelity, as well as the development and validation of novel genotypic assays used on clinical samples from HIV-1 infected patients enrolled in either the AIDS Clinical Trial Group or Microbicides Trials Network. This work was related to the detection/and quantification of major and minor drug-resistance variants employing standard genotyping, single genome sequencing (SGS), and allele-specific PCR in the context of ART efficacy and mother-to- child transmission. This research was instrumental in determining the predictive value that these major and minor HIV-1 drug-resistant variants have on clinical outcomes.
Currently, Dr. Halvas's research involves investigating the role that clonal expansions of HIV-1 infected cells play in HIV-1 persistence and carcinogenesis. This research is being conducted through the application of SGS to detect cellassociated viral DNA and RNA, virus-associated RNA, and full length viral genomes, as well as the recovery of infectious virus, and the capture of integration sites in these HIV-1 infected cells.

Professional Affiliations and Society Memberships

- Member, American Society of Microbiology, 2001-present

Lee H. Harrison, MD

Dr. Harrison is a Professor of Medicine and heads the Infectious Diseases Epidemiology Research Unit. His research has focused on the epidemiology and molecular epidemiology of important bacterial pathogens, including *Haemophilus influenzae*, *Streptococcus pneumoniae*, group B *Streptococcus*, *Neisseria meningitidis*, methicillin-resistant *Staphylococcus aureus*, and *Clostridium difficile*. A major focus of his research is methods for enhanced detection of hospital-acquired transmission of bacterial pathogens. Dr. Harrison is also the Director of an NIH Fogarty International Center training grant on the epidemiology and prevention of HIV in Mozambique and on public health genomics in South Africa, as well as ID's recently funded T32 training grant focused on antimicrobial resistance.

Study Sections

- Member, Infectious, Reproductive, Asthma and Pulmonary Conditions (IRAP) Study Section, 2017-present

Advisory Committee Memberships and Leadership Positions

- Member, Active Bacterial Core Surveillance Steering Committee, CDC, 2000-present
- Member, Emerging Infectious Diseases Network Steering Committee, CDC, 2000-present
- Chairman, Allegheny County Board of Health, 2013-present

Professional Affiliations and Society Memberships

- Member, Alpha Omega Alpha, Honor Medical Society, 1982-present
- Member, American Society for Clinical Investigation, 2000-present
- Member, American Epidemiological Society, 2006-present
- Fellow, Infectious Diseases Society of America (IDSA), 2017-present

Editorships

- Editorial Advisory Board, *Journal of Infectious Diseases*, 2006-present

Ken S. Ho, MD, MPH

Dr. Ho's primary research focuses on biomedical strategies for HIV prevention and, in particular, HIV pre-exposure prophylaxis (PrEP) and microbicide development. He conducts multiple clinical trials of PrEP and microbicides at the University of Pittsburgh Clinical Trial Unit. He was the investigator of record for the Next-PrEP Study (HPTN-069), a safety and tolerability study of maraviroc based regimens for PrEP. He is also the protocol chair for MTN-033: An Open Label Randomized Phase 1 Pharmacokinetic Study of Dapivirine Gel Administered Rectally to HIV-1 Seronegative Adults. Additionally, Dr. Ho is the investigator of record of several other microbicide studies, such as DREAM-01 (evaluation of a tenofovir enema), MTN-026 (Dapivirine gel), MTN-035 (behavioral study of rectal

microbicide placebo products), and PREVENT (phase 1 trial of rectal griffisthin gel). Dr. Ho is also the Medical Director of the Pitt Mens Study, the Pittsburgh branch of the Multicenter AIDS Cohort Study.

Advisory Committee Memberships and Leadership Positions

- Member Education Committee, Gay Lesbian Medical Association, 2011-present
- Member, Pharmacovigilance Safety Officer, Microbicide Trials Network, 2011-present
- Member, Committee G, University of Pittsburgh Institutional Review Board, 2013-present
- Board Member, Pittsburgh AIDS Task Force, 2014-present
- Member, AIDS Free Pittsburgh Advisory Committee, 2015-present
- Chair, AIDS Free Pittsburgh PrEP Subc, 2015-present
- PrEP Subcommittee, Chair, AIDS Free Pittsburgh, 2015-present
- Board Member, Shepherd Wellness Center, 2018-present

Jana L. Jacobs, PhD

Dr. Jacobs's research is focused on the persistent reservoir that precludes HIV-1- infected patients on antiretroviral therapy from achieving cure. In particular, she focuses on the development of molecular-based assays to characterize the reservoir and assess clinical strategies aimed at perturbing or eliminating this reservoir.

Professional Affiliations and Society Memberships

- Member, American Society for Microbiology, 2015-present
- Member, AIDS Clinical Trials Group, 2016-present

Dontcho V. Jelev, PhD

Dr. Jelev's research interests include constructing phage display libraries for antibody discovery; discovery of human antibodies and/or humanization of non-human antibodies targeting validated epitopes of cancer-specific antigens; and developing site-specific antibody-drug conjugates or bi-specific antibodies for use as cancer therapeutics.

Eun Jeong Kwak, MD

Dr. Kwak's research interests include outcomes and therapeutics in viral infections in solid organ transplant recipients, as well as cytomegalovirus and respiratory viral infections in lung transplant recipients, management and prophylaxis for fungal infections in lung transplant recipients, and outcomes and management of infections by multidrug resistant (MDR} pathogens in solid organ transplant recipients. Additionally, Dr. Kwak is interested in the management of nontuberculous mycobacterial infections in transplant recipients and candidates; post operative surgical site infections in liver transplant recipients; and antibiotic stewardship in the era of MDR infections.

Advisory Committee Memberships and Leadership Positions

- Member, Quarterly Pharmacy and Therapeutics Committee, System-wide Committee, University of Pittsburgh Medical Center, 2012-present

Professional Affiliations and Society Memberships

- Member, American Society of Transplantation, 2005-present
- Member, American Society of Microbiology, 2009-present
- Member, Infectious Diseases Society of America, 2010-present

Editorships

- Reviewer, *Liver Transplantation Journal*, 2008-present
- Reviewer, *Transplant Infectious Diseases*, 2008-present
- Reviewer, *American Journal of Transplantation*, 2008-present
- Reviewer, *American Society of Transplantation*, 2019-present
- Reviewer, *Clinical Transplantation*, 2019-present

Sui Kwong Li, MD

Dr. Li is interested in quality improvement as it applies to antimicrobial stewardship and telemedicine.

Professional Affiliations and Society Memberships

- Member, American Medical Association, 2013-present
- Member, American College of Physicians, 2013-present
- Member, Infectious Diseases Society of America, 2016-present
- Member, Society for Healthcare Epidemiology in America, 2016-present

Wei Li, PhD

Dr. Li's lab focuses on the development of monoclonal antibodies/domains against cancer related antigens and infectious diseases through phage and yeast display technology. During this year, we have achieved the constructions of several phage display antibody libraries with different formats such as single domain antibodies (VH) and Fab (antigen binding fragment), from which we have retrieved sets of binders against cancer antigens such as CD22 (leukemia), CD276 (pan-cancers), FLT3 (leukemia), IL1RAP (Ewing sarcoma), FGFR4 (Rhabdomyosarcoma), SARS-CoV-2 Spike protein (COVID19). These promising binders are now undergoing in vitro bio-physical characterization for the developability and functional characterization.

Shihui Liu, MD, PhD

Dr. Liu investigates bacterial protein toxins, including anthrax toxins in pathogenesis, and develops therapeutics for the related diseases. In addition, he studies the signal transduction pathways, with special emphasis on the RAS-RAF-MEK-ERK pathway in cancer, and he is working to develop therapeutics for targeting these pathways for cancer therapy.

Editorships

- Academic Editor, *Toxins* (an MDPI publication), 2013-present
- Academic Editor, *The Journal of Toxins*, 2013-present
- Journal Reviewer, *Oncotarget*, 2017-present
- Ad hoc reviewer, *Proceedings of the National Academy of Science of the USA*, 2019-present

Bernard J. C. Macatangay, MD

Dr. Macatangay is involved in research focusing on HIV-associated inflammation and on immunotherapeutic strategies for achieving sustained HIV remission off antiretroviral therapy. Specifically, the overall goal of his research is to further define the role of immunoregulatory pathways in HIV-associated inflammation and HIV persistence in order to design successful immunotherapeutic strategies to decrease chronic inflammation and address important knowledge gaps in HIV cure research.

Study Sections

- Ad Hoc Review Panel Member, HIV Immunopathogenesis and Vaccine Development Study Section, NIH, 2019
- Ad Hoc Member, Protocol Review Committee for Blood and Marrow Transplantation, NHLBI, 2020

Advisory Committee Memberships and Leadership Positions

- Member, Medicine Residency and Infectious Diseases Fellowship Interview Committee, University of Pittsburgh School of Medicine, 2010-present
- Member, Clinical Working Group, Multicenter AIDS Cohort Study, 2011-present
- Protocol Immunologist ACTG Studies, A5321/A5341s, A5325/A5330s, A5342, A5370, A5374, A5364, A5388, A5389, 2013-present
- Elected Member, End-Organ and Inflammation Transformative Science Group, AIDS Clinical Trials Group (ACTG), 2014-present
- Member, Immune Activation Focus Group, ACTG, 2014-present

- Chair, Viral Immune Pathogenesis Working Group, Multicenter AIDS Cohort Study, 2015-present
- Elected Member, HIV Reservoirs and Viral Eradication Transformative Science Group, ACTG, 2016-present
- Co-Chair, Viral Immune Pathogenesis Working Group, Multicenter AIDS Cohort Study - WIHS Combined Cohort Study, 2018-present

Editorships

- Editorial Advisory Board Member, *Open-Forum Infectious Diseases Journal*, 2014-present
- Reviewer, *AIDS*, 2017-present

Jane W. Marsh, PhD

Dr. Marsh is the Director of the Microbial Genomics Epidemiology Laboratory (MiGEL) and works closely with MiGEL Principal Investigator, Dr. Lee H. Harrison, to investigate genomic epidemiology of hospital-acquired infections. Current research is focused on integration of whole genome sequences of multi-drug resistant bacteria from hospitalized patients with the electronic health record to enhance detection of hospital-associated transmission. Dr. Marsh oversees the timely reporting of sequencing results to UPMC Infection Prevention to enable rapid implementation of appropriate interventions to prevent further transmission and outbreaks.

Professional Affiliations and Society Memberships

- Member, American Society for the Advancement of Science, 1999-present
- Member, American Society of Microbiology, 2003-present

Elise M. Martin, MD, MS

Dr. Martin's primary research focuses on assessing the impact of removing routine contact precautions for methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococci* (VRE) on hospital-acquired infections (HAIs) with these organisms, as well as other hospital outcomes, including costs, hospital patient flow, and adverse events. She is also working to assess optimal gram negative contact precaution strategies necessary to prevent multidrug resistant gram-negative HAIs.

Advisory Committee Memberships and Leadership Positions

- Publication Committee Member, Society for Healthcare Epidemiology of America, 2019

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2017-present
- Member, Society for Healthcare Epidemiology of America, 2017-present

Sarah K. McBeth, MD, MPH

Dr. McBeth's research focuses on identifying barriers to Hepatitis C treatment and monitoring treatment outcomes in the HIV/Hepatitis C co-infected population. She also conducts ongoing projects on retention in care and NAFLD among people living with HIV.

Advisory Committee Memberships and Leadership Positions

- Advisor, Pennsylvania Office of Medical Assistance Programs Hepatitis C Direct Acting Antiviral Guidelines, 2017-present

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2013-present

Deborah K. McMahon, MD

Dr. McMahon's research focuses on the HIV reservoir and eradication strategies. She currently serves as co-chair of two NIH-funded AIDS Clinical Trials Group studies. The first study examines the decay of the HIV reservoir in HIVinfected patients receiving long-term antiretroviral therapy; its

substudy intensively examines the reservoir in anatomic sites, such as the blood, gut-associated lymphatic tissue, and CSF. The second study evaluates the impact of a histone deactelyase inhibitor, romidepsin, on immune activation and HIV expression in HIV-infected patients suppressed on antiretroviral therapy. She also leads a HRSA-funded Special Project of National Significance focused on HIV workforce capacity building. She has over 25 years of HIV clinical research experience.

Advisory Committee Memberships and Leadership Positions

- Member, Institutional Biosafety Committee, University of Pittsburgh, 2005-present
- Member, Clinical Advisory Committee, National HIVQUAL Project, 2008-present
- Chair, Drug Utilization and Review Committee, Special Pharmaceutical Benefits Program, Pennsylvania Dept. of Health, 2010-present
- Medical Director, Member, Executive Committee, Brother's Brother Foundation, 2010-present
- Member, Special Pharmaceutical Benefits Program, PA DPW, 2010-present
- Member, HIV Reservoirs and Viral Eradication Transformative Science Group, ACTG, 2013-present
- Member, Antiretroviral Therapy Strategies Transformative Science Group, ACTG, 2017-present

Mustapha M. Mustapha, MBBS, PhD, MPH

Dr. Mustapha is affiliated with the Microbial Genomic Epidemiology Laboratory and Center for Innovative Antimicrobial therapy. Dr. Mustapha's research focuses on the epidemiology and genomic epidemiology of important vaccine-preventable and drug-resistant bacterial pathogens with emphasis on global epidemiology of Neisseria meningitidis. Dr. Mustapha also applies bacterial whole genome sequencing analyses for the enhanced detection of hospital outbreaks and to the study of mechanisms of drug resistance among extensively drug-resistant pathogens in the hospital.

Professional Affiliations and Society Memberships

- Member, American Society for Tropical Medicine and Hygiene, 2012-present
- Member, Consortium of Universities for Global Health, 2013-present
- Member, American Society for Microbiology, 2015-present
- Member, Delta Omega Honorary Public Health Society, 2016-present

Sowmya Nanjappa, MBBS, MD

Dr. Nanjappa research focuses on the optimal use of antibiotics in clinical infectious disease with a special interest in histoplasmosis endemic fungal infection.

Professional Affiliations and Society Memberships

Fellow, Infectious Diseases Society of America, 2019-present

Minh-Hong T. Nguyen, MD

Dr. Nguyen's multiple research interests are medical mycology research, including projects on the mechanisms and clinical impact of antifungal drug resistance, and molecular pathogenesis of invasive Candida infections. Since 2016, she has expanded her interests to include Zygomycetes genetics and epidemiology. In addition, her research focuses on XDR bacterial and antimicrobial stewardship research, including projects on evolution and tolerance/resistance and pathogenic mechanisms of carbapenem-resistant *Enterobacteriaceae* (CRE) and other Gram-negative bacteria; the development of novel antibiotic treatment strategies based on bacterial genetics and pharmacokinetic-pharmacodynamic (PK-PD) principles; the clinical and economic impact of XDR infections and antimicrobial stewardship interventions; and clinical trials of new antimicrobials and diagnostic tests. Dr. Nguyen's Transplant Infectious Diseases research includes projects on the role of the microbiome in infections and outcomes among transplant recipients, the impact of rectal CRE carriage on transplant patients' outcome, and clinical studies and trials on a wide range of opportunistic fungal, bacterial, and viral infections.

Study Sections

- Reviewer, Non-HIV Anti-Infective Therapeutics (ZRG1 IDM-A (11)), NIH Center for Scientific Review, 2019-2020
- Ad hoc Reviewer, T32, K awards, P01, SBIR and STIR award, NIAID, 2011-present
- Chair, Molecular Diagnostics Section, Aspergillosis in Solid Organ Transplant Section and Airway Aspergillosis Section of Aspergillosis Management Guidelines, Infectious Diseases Society of America, 2014-present

Editorships

- Reviewer, *Antimicrobial Agents & Chemotherapy*, 1994-present
- Reviewer, *Clinical Infectious Diseases, Journal of Infectious Diseases*, 1995-present
- Reviewer, *Transplantation, Transplant Infectious Diseases*, 2008-present
- Reviewer, *American Journal of Transplantation*, 2009-present
- Scientific Editor, *PLoS One*, 2014-present

Urvi M. Parikh, PhD

Dr. Parikh's translational research laboratory uses novel technical approaches to solve public health problems in the research areas of HIV prevention and drug resistance. Dr. Parikh leads the USAID/PEPFAR-funded Global Evaluation of Microbicide Sensitivity (GEMS) Project, which seeks to: characterize resistance risk from pre-exposure prophylaxis (PrEP) trials and demonstration projects; identify the most effective and efficient HIV testing and resistance monitoring strategies; generate evidence-based policy recommendations for HIV diagnostic testing frequency and ARV resistance monitoring; and monitor seroconverters from PrEP roll-out programs for ARV resistance in selected clinics in South Africa, Zimbabwe, and Kenya. The GEMS project brings together a diverse team of laboratory scientists, mathematical modelers, policy experts, health economists, in-country stakeholders, demonstration project teams, and others working toward the common public health goal of minimizing resistance risk during PrEP roll-out. Her laboratory also serves as the Virology Core for the MTN, with the aim of confirming virologic endpoints for all MTN studies; assessing population and low-frequency resistance in seroconverters from HIV prevention trials; developing new assays and addressing research questions relevant to the field of HIV prevention; and providing virology support to MTN protocols, international clinical research sites, and community working groups. In addition to these major projects, Dr. Parikh's lab is investigating the detection of Y chromosome DNA in genital tract specimens using quantitative real-time PCR as a biomarker for unprotected sex and evaluating new HIV diagnostic algorithms using antigen-based rapid tests for identifying seroconverters.

Advisory Committee Memberships and Leadership Positions

- Member, MTN-016 Protocol Team, 2008-present
- Member, MTN SCHARP/Laboratory Core Group, 2008-present
- Member, MTN Laboratory Core, 2008-present
- Member, MTN Bioscience Working Group, 2008-present
- Member, MTN-015 Management Team, 2008-present
- Member, MTN-003 Protocol and Publications Committee Member, 2008-present
- Active Voting Member, Virology Quality Assurance Advisory Board, 2010-present
- Member, MTN-025 Management Team Member, 2014-present
- Member, MTN Community Working Group, 2014-present
- Advisor, World Health Organization, Geneva, Switzerland, 2016-present

Christian O. Perez, MD

Dr. Perez investigates endemic fungal infections, specifically examining diagnostics and clinical presentations in immunocompromised populations. He has also investigated the utility of Outpatient Parenteral Antibiotic Therapy (OPAT) progams as well.

Professional Affiliations and Society Memberships

- Member, American Medical Association, 2007-present
- Member, Infectious Diseases Society of America, 2014-present

Sharon A. Riddler, MD

Dr. Riddler has more than 20 years of experience in clinical research funded by the NIH and industry. She is interested in all aspects of the clinical research process, including protocol development, implementation, and analysis of results. She is the Co-PI of the NIH/DAIDS-funded Pitt-OSU HIV/AIDS Clinical Trials Unit and Site Leader for the University of Pittsburgh Clinical Research Site (affiliated with both the AIDS Clinical Trials Group and the Microbicide Trials Network). Dr. Riddler is a Protocol Physician for the Microbicide Trials Network. She has been Chair or Co-Chair for several network studies in the ACTG (A5115, A5142, A5276s, and A5342) and MTN (MTN-015 and MTN-0038). Local clinical trials have focused on immune-based therapies for chronic HIV infection. She is currently the Co-PI for a recently completed U01-funded Phase I study of dipyridamole for immune activation in HIV-infected participants and is Co-PI for a U01 funded clinical trial of dendritic-cell immunotherapy for HIV. Dr. Riddler's group collaborates widely across the University of Pittsburgh to accomplish state-of-the-art clinical trials.

Photo
Dr. Riddler has been leading efforts for the Phase 3 trial of the AstraZeneca COVID vaccine here at Pitt.

Study Sections

- Member, NIAID Clinical Trial Implementation Cooperative Agreement (U01) Review Committee (ZAI1 UKS-A (M3), 2014-present
- Member, National Institute of Allergy and Infectious Diseases, Special Emphasis Panel ZAI1-RB-A-S1 2019, NIAID, 2019
- Office of Orphan Products Development, Infectious Disease Grant Panel Reviewer, FDA, 2019
- Chairperson, Special Emphasis Panel ZAI1-MSA-A (M1), National Institute of Allergy and Infectious Diseases, 2020

Editorships

- Reviewer, Multiple journal (*AIDS*, *Journal of Acquired Immunodeficiency Syndrome*, *Journal of Infectious Diseases, European Journal of Clinical Investigation)* 2000-present

Honors and Awards

- Recipient of UPMC 2019 Excellence in Patient Experience Award, UPMC, 2019

Neel B. Shah, MD

Dr. Shah's research interests include better understanding how to diagnose, manage, and treat prosthetic joint infections. He is currently working on determining what factors determine clinical outcomes associated with patients who undergo debridement and retention of their infected prosthetic joint, and how modifying these factors could help in improving patient outcomes.

Advisory Committee Memberships and Leadership Positions

- Co-Director, Division of Infectious Diseases Marketing and Communications Management, 2016-present
- Member, Infection Control Committee, UPMC Magee-Women's Hospital, 2016-present
- Member, Antibiotic Stewardship Committee, UPMC Magee-Women's Hospital, 2016-present

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2010-present

Kathleen R. Sheridan, DO

Dr. Sheridan's research focuses on the delivery of quality care to patients discharged from the hospital on IV antibiotics through the Outpatient Parenteral Antibiotic Therapy (OPAT) program, which seeks to prevent hospital readmissions and antibiotic-associated adverse events.

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America Quality Committee, 2016-present

Ryan K. Shields, PharmD, MS

Dr. Shields is a translational researcher who is interested in antimicrobial drug resistance in gram-negative bacteria and yeast. His research focuses on the use of molecular markers of resistance to predict patient responses to treatment; the use of pharmacokinetic-pharmacodynamic models to suppress and overcome antimicrobial resistance; antimicrobial susceptibility testing methods; and the clinical impact of infections due to extensively-drug resistant pathogens. Using these approaches, Dr. Shields has developed treatment paradigms for difficult-to-treat pathogens, including *Candida glabrata*, *Acinetobacter baumannii*, and carbapenem-resistant *Klebsiella pneumoniae*, leading to improved patient outcomes. Dr. Shields's laboratory is also interested in elucidating new mechanisms of antimicrobial drug resistance against recently FDA-approved antimicrobial agents.

Advisory Committee Memberships and Leadership Positions

- Adviser, CLSI Antifungal Subcommittee, 2017-present

Professional Affiliations and Society Memberships

- Member, Society of Infectious Diseases Pharmacists, 2008-present
- Member, American Society for Microbiology, 2009-present
- Member, American College of Clinical Pharmacy, 2012-present
- Member, Infectious Diseases Society of America, 2018-present

Editorships

- Editor, *Antimicrobial Agents and Chemotherapy*, 2020
- Reviewer, Multiple journals (*Transplant Infectious Diseases*, *Medical Mycology*, *Antimicrobial Agents and Chemotherapy*, *American Journal of Infection Control*, *Journal of Antimicrobial Chemotherapy, PLoS One*, *International Journal of Antimicrobial Agents*, *Diagnostic Microbiology and Infectious Diseases*, *BMC Research Notes*, *Lancet Infectious Diseases*, *Clinical Infectious Diseases)* 2012-present
- Editorial Board Member, *Antimicrobial Agents and Chemotherapy*, 2018-present
- Editorial Board Member, *Contagion*, 2018-present
- Section Editor, *Multidrug Resistant Infections*, 2018-present

Fernanda P. Silveira, MD, MS

Dr. Silveira is interested in clinical research that promotes the health of the patients in her care. As such, some of her projects include the study of influenza vaccine effectiveness in preventing hospital admissions; clinical trials of new agents to treat respiratory viral infections in lung transplant recipients and CMV; epidemiological description and assessment of risk factors for common infections after transplantation; and improvement management of infections due to multi-drug resistant organisms.

Advisory Committee Memberships and Leadership Positions

- Participant, ID Educational Initiative, American Society of Transplantation, 2007-present
- Member, Writing Committee, Practice Consensus Document for Strategies to Prevent and Manage Infections Related to Mechanical Circulatory Devices, International Society for Heart and Lung Transplantation, 2015-present
- Infectious Diseases Council, International Society for Heart and Lung Transplantation, 2015-present
- Member, Patient Safety and Quality Initiative for Transplant Infectious Diseases Workgroup, Infectious Diseases Council, American Society of Transplantation, 2017-present
- Invited member, "Consensus Statement on the Use of Hepatitis C Virus-Infected Organ Donors for Cardiothoracic Transplantation", International Society for Heart and Lung

Transplantation, 2018-present
- Member, Program Committee, 40th Annual Meeting and Scientific Sessions, International Society for Heart and Lung Transplantation, 2019
- At-large representative (nominated), Leadership Advisory Forum, International Society for Heart and Lung Transplantation, 2020-2022

Professional Affiliations and Society Memberships
- Member, Infectious Diseases Society of America, 2003-present
- Member, American Society of Transplantation, 2005-present
- Member at large (elected), ID Community of Practice, American Society of Transplantation, 2018-present
- Fellow, Infectious Diseases Society of American, 2018-present

Editorships
- Reviewer, *International Society for Heart and Lung Transplantation*, 2013-present
- Reviewer, *Transplantation*, 2013-present
- Associate Editor, *Clinical and Biomedical Research*, 2014-present
- Section Editor, Fungal Infections, *Current Treatment Options in Infectious Diseases*, 2018-present
- Reviewer, Multiple journals (*Clinical Infectious Diseases, Journal of Heart and Lung Transplantation, Clinical Transplantation*), 2018-present

Major Lectureships and Seminars
- Invited Speaker, Annual Meeting of the American Transplant Congress, Seattle, WA, 2018-present
- Invited Speaker, 3rd Annual UPMC Lung Transplant Symposium, Pittsburgh, PA, 2018-present

Honors and Awards
- Honoree, Best Doctors in America, 2018-present

Nina Singh, MD

Nina Singh's area of research interest is opportunistic viral and fungal infections in organ transplant recipients. Her specific interests include herpes virus infections (cytomegalovirus and human herpesvirus-6) in transplant recipients. Her work in this area pertains to clinical trials to optimize antiviral prophylaxis and assess CMV-specific immune responses after transplantation. The knowledge gained from these studies has implications for elucidating the mechanistic basis for CMV disease despite current prophylactic practices and for designing immune-based therapies in the future as adjuncts to antivirals for the prevention of CMV. A key area of her research interest is invasive cryptococcosis in transplant recipients. Dr. Singh has conducted pivotal studies to assess risks, disease associations, outcomes, and immunopathogenesis as it relates to this yeast in transplant recipients. These studies have made a major contribution toward the scientific rationale for the Infectious Diseases Society of America (IDSA) and American Society of Transplantation (AST) guidelines for *Cryptococcus* in transplantation. More recently, Dr. Singh's work has focused on characterizing immune reconstitution syndrome in organ transplant recipients with opportunistic infections and on understanding how manipulation of iatrogenic immunosuppressants has the ability to alter the host immunologic milieu, posing a risk for this poorly understood entity.

Advisory Committee Memberships and Leadership Positions
- Member, Joint Research Awards Committee, Infectious Diseases Society of America, 2011-present
- Chair, Panel for Development of Guidelines for Donor-Derived Fungal Infections in Organ Transplant Recipients, 2013-present
- Member, International Consensus Panel, Development of Guidelines for the Prevention of CMV in Solid Organ Transplant Recipients, 2013-present

- Member, INSIGHT Post-Transplant Infections Scientific Interest Group, 2013-present
- External Advisory Committee Member, Fred Hutchinson Cancer Research Center, Seattle, WA, 2015-present
- Member, External Advisory Committee, T32 Training Program in Infectious Diseases in the Immunocompromised Host, Fred Hutchinson Cancer Research Center, 2015-present
- Member, Institutional Review Board, VAPHS, 2015-present
- Panel Member, Global guideline for the diagnosis and management of mucormycosis, European Confederation of Medical Mycology (ECCM), 2018-present

Editorships

- Associate Editor, *Transplantation*, 2014-present

Nicolas P. Sluis-Cremer, PhD

Dr. Sluis-Cremer's laboratory uses a multi-disciplinary approach that includes biophysics, biochemistry, virology, and analysis of clinical samples to gain insight into the mechanisms of action of antiretroviral drugs; antiviral and antimicrobial drug resistance; and understanding how HIV-1 persists in infected individuals despite potent antiretroviral therapy. His lab also studies antibiotic resistance and is exploring novel therapeutic approaches to reverse fosfomycin resistance.

Study Sections

- Reviewer, Chemistry of Life Processes Program in the Division of Chemistry, NSF Grant, 2011-present
- Reviewer, Special Emphasis Panel in Response to RFA-AI-12-003 entitled Integrated Preclinical/Clinical Program for HIV Topical Microbicides (IPCP-HTM), NIH Study Section, 2011-present
- Reviewer (Grant), NIH Study Section, Special Emphasis Panel/Scientific Review Group AARR-J (AIDS Predoctoral and Postdoctoral), 2011-present
- Ad hoc reviewer: AARR Fellowship Panel: ZRG1 F17-P (20)19, NIH Center for Scientific Review, 2019
- Ad hoc reviewer: Medical Research Program of the Congressionally Directed Medical Research Program, Department of Defense, 2020

Advisory Committee Memberships and Leadership Positions

- Member, Scientific Committee, HIV DART, Frontiers in Drug Development for Antiretroviral Therapies, 2010-present

Editorships

- Ad hoc Reviewer, Multiple journals (*Virology*, *Biochemistry*, *AIDS*, *Journal of Biological Chemistry*, *Nature, Antimicrobial Agents & Chemotherapy, Retrovirology, Journal of Virology*), 2013-present

Graham M. Snyder, MD, MS

Dr. Snyder's research in the field of infection prevention has focused on innovation in preventing device-associated nosocomial infections. He has developed content and implementation expertise in reduction of catheter-associated urinary tract infections, an important healthcare-associated infection.

A second major area of expertise in device-related infections focuses on endoscopic retrograde cholangiopancreatography (ERCP) duodenoscopes, which have been associated with outbreaks of infections due to highly resistant bacteria. With colleagues in Gastroenterology and Infection Control/Hospital Epidemiology, as well as trainees under his mentorship, Dr. Snyder conducted a clinical trial randomizing ERCP duodenoscopes to three arms of disinfection/sterilization. Related investigations have included the role for non-microbiologic sampling in duodenoscope contamination surveillance, maximum "hang time" for duodenoscopes prior to reprocessing, frequency and anatomic site of patient carriage of antimicrobial-resistant pathogens among this high-risk patient population,

and the development of methods for sampling duodenoscopes.

Advisory Committee Memberships and Leadership Positions

- Publications Committee Member, Society for Healthcare Epidemiology of America, 2009-present
- Incoming Chair, Publications Committee, Society for Healthcare Epidemiology of America, 2020-present

Giraldina J. Trevejo-Nunez, MD

Dr. Trevejo-Nunez's research focuses in understanding the host immune response against bacterial pneumonia, in particular the role of IL-22 to contain and enhance the immune response upon pneumococcal pneumonia.

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America (IDSA), 2007-present
- Member, American Association of Immunologists (AAI), 2014-present
- Member, American Thoracic Association, 2016-present

Daria N. Van Tyne, PhD

Dr. Van Tyne and her lab studies how bacteria evolve during human infection to resist antibiotics and the host immune system, using comparative genomics and functional approaches. They sequence the genomes of bacteria from human infections and use functional genomics to identify and characterize novel resistance mechanisms. They also work to develop new therapeutic approaches for multidrug-resistant infections.

Advisory Committee Memberships and Leadership Positions

- Organizing Committee Member, 6th International Conference on Enterococci, 2019-present
- Member, Antimicrobial Resistance Leadership Group PHAGE Task Force, Antimicrobial Resistance Leadership Group, 2020-present

Editorships

- Editorial Board Member, *Microbial Genomics*, 2020-present
- Member, *American Society for Microbiology*, 2013-present

Peter J. Veldkamp, MD, MS

Dr. Veldkamp's long-term interests are HIV care, general infectious diseases, and travel/tropical medicine. These diseases especially affect underserved populations in low resource settings. The challenge to diagnose and treat these conditions with minimal cost and maximal efficacy appeals to him. Dr. Veldkamp strives to enhance the health care providers' impact in patient-centered care settings.

Professional Affiliations and Society Memberships

- Member, Academy of Master Educators, University of Pittsburgh School of Medicine, 2009-present

J. Alex Viehman, MD

Dr. Viehman focuses his clinical research in several areas, including drug resistance, antibiotic stewardship, and quality improvement. Currently, he is working on projects evaluating patient risk factors for drug-resistant pathogens, including vancomycin-resistant *Enterococcus faecium* and adjunctive therapy for patients with *C. difficile* infection. In addition, he is evaluating barriers to vaccination against *Streptococcus pneumoniae* in patients who meet appropriate indications.

Advisory Committee Memberships and Leadership Positions

- Member, Antimicrobial Management Program, UPMC, 2013-present

- Member, Clinical Competency Committee, Infectious Diseases Fellowship, University of Pittsburgh, 2016-present
- Member, Quality Council-Infectious Diseases/HIV UPMC, 2017-present

Professional Affiliations and Society Memberships

- Member, Infectious Diseases Society of America, 2014-present

Mohamed H. Yassin, MD, PhD

Dr. Yassin's research interests center on decreasing hospital-acquired infections. His areas of focus are infection prevention and hospital epidemiology; cost effectiveness analysis (CEA); surveillance for multidrug resistant organisms (MRSA, Acinetobacter, and other Gram-negative resistant pathogens); endoscopic processing; and Legionella prevention in hospital water.

Advisory Committee Memberships and Leadership Positions

- Chair, Infection Control Committee, UPMC Mercy, 2011-present
- Volunteer Physician, Free Clinic, Braddock, PA, 2012-present
- Member, Quality Improvement Committee, UPMC Mercy, 2013-present
- Member, E-practice Guide Committee, UPMC, 2013-present
- Member, Antibiotic Core Committee, UPMC, 2013-present
- Member, Infection Control System-Wide, UPMC, 2013-present

GRANTS AND CONTRACTS
AWARDED

July 1, 2019 to June 30, 2020

PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Ambrose, Zandrea	Molecular Drivers of Vascular Stiffness and Metabolic Dysfunction in HIV-Induced Pulmonary Arterial Hypertension	NHLBI	$22,783	$12,872
Ambrose, Zandrea	Visualization of In Vivo HIV-1 Vaginal Transmission in the Presence and Absence of PrEP	NIAID	$363,955	$189,266
Ambrose, Zandrea	Influence of SIV Replication on TB Progression and Immunity	NIAID	$153,092	$77,384
Ambrose, Zandrea	Pittsburgh Center for HIV Protein Interactions (PCHPI)	NIGMS	$128,490	$59,721
Apetrei, Cristian	New Strategy to Improve Gastrointestinal Health in SIV/HIV	NIDDK	$451,677	$242,467
Apetrei, Cristian	Assessing the role of GI tract damage to HIV/SIV disease progression	NIDDK	$91,626	$51,769
Apetrei, Cristian	Animal Model for Testing SIV Latency Reversal Strategies	NIAID	$392,216	$104,064
Apetrei, Cristian	Interventions to Reduce Hypercoagulability in Old SIV-Infected NHPs	NHLBI	$24,210	$13,073
Apetrei, Cristian	Interventions to Reduce Hypercoagulability in Old SIV-Infected NHPs Supplement	NHLBI	$2,421	$1,343
Apetrei, Cristian	SIV Pathogenesis in African Green Monkeys and Pigtailed Macaques	NHLBI	$11,958	$6,758
Chen, Beatrice	Pitt-Ohio State - Georgetown Clinical Trials Unit (Beatrice Chen Sub)	NIAID	$31,411	$16,962
Clancy, Cornelius	Microbiome and Host Response Signatures for Pneumonia Among Lung Transplant Recipients	NIAID	$96,544	$28,921
Clancy, Cornelius	Mechanisms of ceftazidime-avibactam susceptibility and resistance among Enterobacteriaceae expressing variant KPCs	NIAID	$138,529	$40,287
Clancy, Cornelius	Candida albicans regulatory pathways contributing to intra-abdominal candidiasis	NIAID	$141,781	$51,499
Culyba, Matthew	Mechanism and Consequences of Temporal Gene Expression for SOS-Induced Mutagenesis	NIAID	$174,900	$13,992
Dimitrov, Dimiter	Animal Model for Testing SIV Latency Reversal Strategies	NIAID	$73,861	$41,637
Dimitrov, Dimiter	Targeting Oncogenic ALK Signaling in Neuroblastoma	NCI/Children's Hospital of Philadelphia	$59,836	$33,807
Dimitrov, Dimiter	FGFR4-CAR-based Immunotherapy of Fusion-Positive Rhabdomyosarcoma	NCI/Seattle Children's Hospital	$51,700	$29,212

PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Doi, Yohei	Colistin-Resistant Acinetobacter baumannii	NIAID	$110,136	$53,395
Doi, Yohei	Mechanisms of Host Protection Against Pathogen-Secreted Proteases in Acute Lung Injury	NHLBI	$22,189	$12,537
Doi, Yohei	Host Control Mechanisms Against K. Pneumoniae Infection in the Lungs	NHLBI	$20,652	$11,668
Doi, Yohei	Study Network of Acinetobacter as a Carbapenem-Resistant Pathogen (SNAP)	NIAID	$118,872	$60,488
Doi, Yohei	Determinants and Mechanisms of efficacy of Peptide Antibiotics as Novel Sepsis Therapy	NIGMS	$4,948	$2,796
Doi, Yohei	Biomarkers for Urinary Tract	NIDDK	$1,517	$857
Doi, Yohei	Mechanisms of cefiderocol resistance	NIAID	$152,000	$84,750
Doi, Yohei	Consortium on Resistance Against Carbapenems in Klebsiella pneumoniae and Other Enterobacteriaceae (CRACKLE): a Prospective, Observational Cohort Study	NIAID/Duke University	$12,377	$6,684
Doi, Yohei	Gram Negative ARLG Steering Committee Chair	NIAID/Duke University	$18,558	$10,485
Doi, Yohei	Gram Negative ARLG Steering Committee Chair	NIAID/Duke University	$19,063	$10,770
Doi, Yohei	ARLG FOCUS	NIAID/Duke University	$10,556	$5,962
Haidar, Ghady	HOPE in Action: A clinical trial of HIV-to-HIV donor liver transplantation	NIAID/Johns Hopkins University	$17,831	$10,075
Haidar, Ghady	Metagenomics shotgun microbial sequencing in post-transplant lymphoproliferative disorders (PTLD-MSMS)	NIAID/ Washington University	$4,163	$2,352
Harrison, Lee	Analyzing Adult Pneumococcal Vaccination Implementation in the Underserved	NIAID	$5,949	$3,361
Harrison, Lee	Enhanced Detection System for Healthcare-Associated Transmission of Infection	NIAID	$422,205	$172,453
Harrison, Lee	University of Pittsburgh Training Program in Antimicrobial Resistance	NIAID	$161,076	$11,246
Harrison, Lee	Analyzing Adult Pneumococcal Vaccination Implementation in the Underserved	NIAID	$6,107	$3,450
Ho, Ken S.	Multicenter AIDS Cohort Study (MACS) Participation in the NHLBI Sleep Research Supplement Program	NHLBI	$4,507	$2,539
Ho, Ken S.	University of Pittsburgh MACS-WIHS CCS	NHLBI	$62,641	$35,392
Ho, Ken S.	Delivery of Rectal Enema as Microbicide DREAM (Project 1)	NIAID/Johns Hopkins University	$69,480	$37,519
Ho, Ken S.	Griffithsin-Based Rectal Microbicides for PREvention of Viral ENTry (PREVENT)	NIAID/University of Louisville	$16,462	$8,889
Ho, Ken S.	Griffithsin-Based Rectal Microbicides for PREvention of Viral ENTry (PREVENT)-Project 3	NIAID/University of Louisville	$70,778	$38,220
Ho, Ken S.	Development of a urine-based point-of-care test for adherence to antiretroviral drugs	NIAID/Magee Womens Research Institute and Foundation	$146,731	$57,808
Ho, Ken S.	Pitavastatin to Reduce Physical Function Impairment and Frailty in HIV (PREPARE)	NIA/University of Colorado	$14,983	$8,453

PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Ho, Ken S.	STD to PrEP	CDC/ Commonwealth of Pennsylvania	$5,972	$621
Macatangay, Bernard	Replication Competent HIV-1 in Blood and Tissues	NIAID	$25,146	$12,456
Macatangay, Bernard	Impact of Poor Sleep on Inflammation and the Adenosine Signaling Pathway in HIV Infection	NHLBI	$91,381	$51,630
Macatangay, Bernard	University of Pittsburgh MACS-WIHS CCS	NHLBI	$25,730	$14,537
Marsh, Jane	Core ABC Activities + FoodNet Active Surveillance and Audits Statewide (Admin Core)	CDC/Johns Hopkins University	$140,459	$36,520
Marsh, Jane	Core ABC Activities + FoodNet Active Surveillance and Audits Statewide	CDC/Johns Hopkins University	$26,342	$14,883
McMahon, Deborah D.	Pharmacoenhancers for antiretroviral therapy: safety and future development	NIAID	$5,087	$2,874
McMahon, Deborah D.	Pennsylvania/MidAtlantic AETC, HRSA	HRSA	$14,000	$1,120
McMahon, Deborah D.	AIDS Clinical Trial Group: ACTG 5315-5321 Protocol Chair	NIAID/Brigham and Women's Hospital, Inc.	$13,137	$7,269
Mellors, John W.	Longitudinal Evaluation of HIV-Associated Lung Disease Phenotypes	NHLBI	$44,249	$23,894
Mellors, John W.	University of Pittsburgh Multicenter AIDS Cohort Study (MACS)	NIAID	$52,893	$28,563
Mellors, John W.	University of Pittsburgh MACS-WIHS CCS Supplement Funds	NHLBI	$41,253	$23,308
Mellors, John W.	Comparison of Dendritic Cell-Based Therapeutic Vaccine Strategies for HIV Functional Cure	NIAID	$80,778	$45,640
Mellors, John W.	Pitt-Ohio State - Georgetown Clinical Trials Unit	NIAID	$891,922	$251,343
Mellors, John W.	Pitt-Ohio State - Georgetown Clinical Trials Unit	NIAID	$91,167	$49,230
Mellors, John W.	Pitt-Ohio State - Georgetown Clinical Trials Unit-ACTG Funds	NIAID	$94,143	$50,837
Mellors, John W.	Pitt-Ohio State - Georgetown Clinical Trials Unit - MTN Funds	NIAID	$96,462	$52,090
Mellors, John W.	Pitt-Ohio State Clinical Trials Unit Administrative Supplement	NIAID	$413,907	$119,237
Mellors, John W.	Pitt-Ohio State - Georgetown Clinical Trials Unit A5341s Supplement	NIAID	$234,616	$126,693
Mellors, John W.	Pittsburgh HIV Mentored Training for Investigation of Co-morbidities and Cure (HIV MeTrICC)	NHLBI	$7,316	$585
Mellors, John W.	Latent Reservoir Characterization and Correlations with Neuropsychiatric Function and Thymic Output over 12 Years in HIV-Infected Children Given Early Antiretroviral Treatment in South Africa	NIMH/ Stellenbosch University	$23,002	$12,998
Mellors, John W.	HIV Prevention Trials Network (HPTN)	NIAID/Family Health International	$6,227	$0
Mellors, John W.	Mechanisms of HIV Drug Resistance	NCI/Leidos Biomedical Research, Inc.	$470,623	$265,902
Mellors, John W.	HIV Prevention Trials Network (HPTN)	NIAID/Family Health International	$223,708	$0

PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Mellors, John W.	LOC, ACTG, EOY 3 Clonal Expansions	NIAID/University of California Los Angeles	$140,196	$79,209
Mellors, John W.	AIDS Clinical trials Group -LOC, ACTG, EOY 1 IUPM	NIAID/University of California Los Angeles	$81,784	$46,218
Mellors, John W.	Combined Immunologic Approaches to Cure HIV-1 (Virology Core)	NIAID/Beth Israel Deaconess	$123,394	$69,718
Mellors, John W.	Subaward No 1061687_14C Supplement	NIAID/Beth Israel Deaconess	$157,033	$88,723
Mellors, John W.	Combined Immunologic Approaches to Cure HIV-1 (14C Management and Operations)	NIAID/Beth Israel Deaconess	$38,128	$21,544
Mellors, John W.	AIDS Malignancy Clinical Trials Consortium Study - HIV Malignancy Reservoir Analysis	NCI/Emmes Corporation	$23,599	$13,333
Mellors, John W.	AIDS Clinical trials Group - Protocol Chair Support A5321	NIAID/University of California Los Angeles	$9,525	$5,381
Mellors, John W.	Laboratory Center (LC): Microbicide Trials Network	NIAID/Magee Womens Research Institute and Foundation	$89,318	$50,465
Mellors, John W.	AIDS Clinical Trial Group (ACTG) , Laboratory Center (LC)	NIAID/University of California Los Angeles	$108,818	$61,524
Mellors, John W.	AIDS Clinical trials Group -AEC Support	NIAID/University of California Los Angeles	$4,359	$2,462
Mellors, John W.	AIDS Clinical trials Group - Protocol A5321-41s	NIAID/University of California Los Angeles	$95,203	$53,790
Mellors, John W.	AIDS Clinical trials Group - Protocol A5354	NIAID/University of California Los Angeles	$76,290	$43,104
Mellors, John W.	MTN Virology Core	NIAID/Magee Womens Research Institute and Foundation	$345,314	$195,103
Mellors, John W.	LOC, ACTG, A5381	NIAID/University of California Los Angeles	$768,739	$76,268
Nguyen, M. Hong	Aspergillosis complicating severe influenza	NIA	$177,331	$90,192
Nguyen, M. Hong	A Randomized Double-Blind, Phase 3 Study Comparing the Efficacy and Safety of High-Titer versus Low-Titer Anti-Influenza Immune Plasma for the Treatment of Severe Influenza A	NCI/Social and Scientific Systems, Inc.	$8,015	$4,328
Nguyen, M. Hong	Epidemiology of CRE and MRSA Transmission: Patient and Organism Factors	NIAID/University of Maryland	$7,279	$4,113
Nguyen, M. Hong	Phase II Multi-Center, Prospective, Randomized, Double-Blind Study of Nitazoxanide in Acute and Chronic Norovirus in Hematopoietic Stem Cell and Solid Organ Transplant Recipients	NIAID/ Northwestern University	$54,004	$24,271

PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Parikh, Urvi	Hormones, Immunity and HIV Risk	NICHD/Magee Womens Research Institute and Foundation	$8,368	$4,728
Parikh, Urvi	Griffithsin-Based Rectal Microbicides for PREvention of Viral ENTry (PREVENT)	NIAID/University of Louisville	$1,315	$710
Parikh, Urvi	Long Acting Film Technology for Contraception and HIV Prevention (LATCH)	NIAID/Magee Womens Research Institute and Foundation	$21,236	$11,998
Parikh, Urvi	Film Antiretroviral Microbicide Evaluation-Project 3	NIAID/Magee Womens Research Institute and Foundation	$27,282	$14,733
Parikh, Urvi	Alignment of PrEP use with HIV risk in young women	NICHD/ University of Washington	$24,268	$13,711
Riddler, Sharon A.	Dipyridamole as a Modulator of HIV-1 Inflammation by Adenosine Regulation	NIAID	$219,784	$113,716
Riddler, Sharon A.	Native-like Envelope Trimer Therapeutic Vaccination for Induction of Broadly Neutralizing Antibodies to Facilitate HIV Functional Cure	NIAID	$840,781	$312,802
Riddler, Sharon A.	Comparison of Dendritic Cell-Based Therapeutic Vaccine Strategies for HIV Functional Cure	NIAID	$893,221	$359,788
Riddler, Sharon A.	REPRIEVE A5332 and A5333s Protocol Funds	NHLBI/ Massachusetts General Hospital	$21,605	$11,667
Riddler, Sharon A.	Leadership Operations Center (LOC): Microbicide Trials Network MTN 033 Year 12 Protocol Funds	NIAID/Magee Womens Research Institute and Foundation	$15,712	$4,722
Riddler, Sharon A.	Leadership and Operations Center (LOC): Microbicide Trials Network, MTN 037 PF	NIAID/Magee Womens Research Institute and Foundation	$18,348	$4,716
Riddler, Sharon A.	Leadership and Operations Center (LOC): Microbicide Trials Network, MTN 038 PF	NIAID/Magee Womens Research Institute and Foundation	$600	$324
Riddler, Sharon A.	Combined Immunologic Approaches to Cure HIV-1 (Clinical SRS)	NIAID/Beth Israel Deaconess	$38,129	$21,543
Riddler, Sharon A.	Combined Immunologic Approaches to Cure HIV-1 (Focus 1, Aim 1)	NIAID/Beth Israel Deaconess	$79,480	$44,906
Riddler, Sharon A.	AIDS Clinical Trial Group (ACTG) Protocol Funds	NIAID/University of California Los Angeles	$162,553	$83,391
Riddler, Sharon A.	LOC: Microbicides Trials Network	NIAID/Magee Womens Research Institute and Foundation	$85,744	$48,446
Riddler, Sharon A.	Leadership and Operations Center (LOC): Microbicide Trials Network-Protocol Funds MTN-035	NIAID/Magee Womens Research Institute and Foundation	$27,551	$7,397

PUBLIC HEALTH SERVICE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Riddler, Sharon A.	Leadership Operations Center (LOC): Microbicide Trials Network Protocol Funds MTN-039	NIAID/Magee Womens Research Institute and Foundation	$52,514	$17,410
Riddler, Sharon A.	REPRIEVE A5332 Kidney Function Sub Study	NHLBI/ Massachusetts General Hospital	$174	$98
Shields, Ryan	Caspofungin Pharmacokinetics-Pharmacodynamics During Intra-Abdominal Candidiasis	NIAID	$167,169	$13,373
Shields, Ryan	Characterization and suppression of resistance to new CRE agents	NIAID	$50,000	$28,250
Shields, Ryan	ARLG FOCUS	NIAID/Duke University	$32,652	$18,448
Silveira, Fernanda	IP 15-002: Flu Vaccine Effectiveness in Those Hospitalized in a Large Diverse Health System	CDC	$79,132	$42,731
Silveira, Fernanda	COVID-19 Supplement - Flu Vaccine Effectiveness in those Hospitalized in a Large Diverse Health System	CDC	$52,121	$28,146
Silveira, Fernanda	Prospective Observational Study of the Risk Factors for Hospital-Acquired Ventilator-Associated Bacterial Pneumonia (HABP/VABP)	FDA/Duke University	$2,722	$1,470
Silveira, Fernanda	A Phase IV Open-label Pharmacokinetic Study of Minocycline for Injection Following a Single Infusion in Critically-Ill Adults (ACUMIN)	NIAID/Duke University	$11,963	$6,699
Silveira, Fernanda	HOPE in Action: A Clinical Trial of HIV-to-HIV Deceased Donor Kidney Transplantation	NIAID/Johns Hopkins University	$11,186	$6,224
Singh, Nina	Prophylaxis versus Preemptive Therapy for CMV in R-D+ Liver transplant Recipients	NIAID	$163,663	$39,367
Singh, Nina	Prophylaxis versus Preemptive Therapy for CMV in R-D+ Liver transplant Recipients	NIAID	$160,853	$12,249
Singh, Nina	Impact of HHV-6 on Outcomes After Liver Transplantation	NIAID	$145,912	$25,166
Sluis-Cremer, Nicolas	NNRT1 Induced Conformational Changes in HIV 1 RT	NIGMS	$82,664	$42,019
Sluis-Cremer, Nicolas	Novel Mechanisms of HIV Resistance to RTIs	NIAID	$243,725	$131,612
Sluis-Cremer, Nicolas	Mechanisms by which Cyanotriazoles Activate Latent HIV	NIAID	$98,230	$48,602
Sluis-Cremer, Nicolas	HIV-Reservoir in Naïve CD+ T Cells	NIAID	$255,840	$121,845
Sluis-Cremer, Nicolas	University of Pittsburgh MACS-WIHS CCS	NHLBI	$11,276	$6,371
Sluis-Cremer, Nicolas	Pittsburgh Center for HIV Protein Interactions (PCHPI)	NIAID	$28,500	$16,102
Trevejo-Nunez, Geraldina	Role of IL-22/IL-22RA2 During Pneumococcal Pneumonia	NHLBI	$154,900	$12,392
Van Tyne, Daria N.	Bacterial Evasion of Innate Defenses at the Ocular Surface	NEI	$154,685	$87,397
Van Tyne, Daria N.	ARLG - Isolation and characterization of lytic phages that target MDR bacteria	NIAID/Duke University	$50,000	$28,250
Yassin, Mohamed H.	Flu Vaccine Effectiveness in those Hospitalized in a Large Diverse Health System	CDC	$15,000	$8,100
		TOTAL PUBLIC HEALTH SERVICE	***$13,843,479***	***$5,590,779***

VETERANS ADMINISTRATION

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Clancy, Cornelius	IPA for Kevin Squires	VAMC	$39,471	$0
Clancy, Cornelius	IPA Hassan Badrane	VAMC	$104,686	$0
Clancy, Cornelius	IPA Shaoji Cheng	VAMC	$72,955	$0
	TOTAL VETERANS ADMINISTRATION		***$217,112***	***$0***

OTHER FEDERAL

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Mellors, John W.	Comprehensive Assessment of Resistance Risk and Development of Policy Recommendations for Microbicide/PrEP Roll Out	USAID	$1,034,828	$149,734
Parikh, Urvi	Protocol (A15-138) 90-Day Pharmacokinetic, Pharmacodynamic, Safety and Acceptability Study of Intravaginal Rings Releasing Tenofovir and Levonorgestrel, Protocol (A15-138)	USAID/Magee Womens Research Institute and Foundation	$2,411	$1,362
Van Tyne, Daria N.	Evolution of Extended-Spectrum Beta-Lactamase-Producing Enterobacterceae in US and Japan	US Civilian Research & Development Fnd	$19,088	$10,785
		TOTAL FEDERAL	***$1,056,327***	***$161,881***

STATE

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Apetrei, Cristian	Tobacco Phase 17 Formula Funds	Commonwealth of Pennsylvania	$126,209	$0
		TOTAL STATE	***$126,209***	***$0***

SOCIETY AND FOUNDATIONS

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Clancy, Cornelius	T2MR Study in SICU Patients at High Risk for Intra-abdominal Candidiasis	Centre Hospitalier Universitaire Vaudois	$20,000	$0
Dimitrov, Dimiter	Immunogenomics to Create New Therapies for High-Risk Childhood Cancers	St. Baldrick's Foundation/ Children's Hospital of Philadelphia	$113,325	$11,333
Dimitrov, Dimiter	ITTC Center for Antibody Therapy	University of Pittsburgh Medical Center	$145,461	$0

SOCIETY AND FOUNDATIONS

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Dimitrov, Dimiter	Novel Approaches to Targeting Ewing Sarcoma	St. Baldrick's Foundation/ University of British Columbia - Vancouver	$44,703	$0
Ho, Ken S.	A Test of Scalable Behavioral Interventions to Increase PrEP Adherence: Value Affirmation and Future Selves	Allegheny-Singer Research Institute	$4,796	$1,199
Jelev, Dontcho V.	Development of new, fully monoclonal human antibodies targeting substrate-binding/recognition region (D+C region) of ADAM10	Memorial Sloan Kettering Cancer Center	$10,000	$0
McMahon, Deborah D.	HIV/AIDS Care, Housing Prevention and Education Services (Part B)	Jewish Healthcare Foundation	$181,818	$18,182
Mellors, John W.	New Approaches to Assessing HIV Reservoirs and Their Depletion	Collaboration for AIDS Vaccine Discovery/Johns Hopkins University	$123,593	$12,359
Mellors, John W.	Validation of Existing Ultra-Sensitive Assays for Quantifying HIV Persistence	Blood Systems Research Institute	$18,106	$1,812
Parikh, Urvi	Service Agreement with IPM	International Partnership for Microbicides, Inc.	$53,742	$16,124
Trevejo-Nunez, Geraldina	IL-22bd regulates oxidative phosphorylation during pneumococcal lung infection	Samuel and Emma Winters Foundation	$10,600	$0
Van Tyne, Daria N.	Pitt CF Research Development Program	Cystic Fibrosis Foundation	$49,863	$0
		TOTAL SOCIETY AND FOUNDATIONS	***$776,006***	***$61,009***

INDUSTRY

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Clancy, Cornelius	Determination of Intracellular and Extracellular Isavuconazole Levels Within the Bronchoalveolar Fluid and Blood	Astellas Pharma US	$24,524	$6,501
Clancy, Cornelius	Clinical Evaluation of Ceftolozane/Tazobactam for the Treatment of Infections Caused by Multiple-Drug Resistant Pseudomonas Aeruginosa	Merck	$9,881	$2,470
Clancy, Cornelius	Impact of Protocol-Driven T2Ba Bacteria Testing on Antimicrobial usage and Outcomes of Liver and Kidney Transplant Recipients	T2 Biosystems	$40,888	$10,222
Clancy, Cornelius	Real-world use of Fidaxomicin for treatment of Clostridium difficile infection among solid organ transplant recipients before and after 2018 IDSA/ SHEA guideline	Merck	$28,192	$8,457
Doi, Yohei	Performance of the Accelerate Pheno System identification and Susceptibility Testing System for Acinetobacter Species	Accelerate Diagnostics	$10,457	$2,614
Doi, Yohei	Assessment of Otopathogens in Young Children with Acute Otitis Media	Merck	$66,396	$19,919

INDUSTRY

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Jacobs, Jana	Adapting the HIV Single-Copy Assay Version 2.0 (iSCA2.0) to Detect HBV DNA	Gilead Sciences, Inc	$70,175	$43,157
Macatangay, Bernard	A Phase 1b, Randomized, Blinded, Placebo-Controlled Dose Escalation Study of the Safety and Biological Activity of GS-9620 in HIV-1 Infected, Virologically Suppressed Adults	Gilead Sciences, Inc	$70,575	$17,644
Macatangay, Bernard	The effect of multiple doses of the TLR7 agonist GS-9620 on the HIV-1 reservoir in ART-suppressed viremic controllers	Gilead Sciences, Inc	$6,825	$1,706
Mellors, John W.	A Phase 1b, Randomized, Blinded, Placebo-Controlled Dose Escalation Study of the Safety and Biological Activity of GS-9620 in HIV-1 Infected, Virologically Suppressed Adults	Gilead Sciences, Inc	$361	$90
Mellors, John W.	Quantifying Reversal of HIV - Latency and Elimination of Latently-Infected CD4+ T-Cells	Gilead Sciences, Inc	$128,213	$32,053
Mellors, John W.	Induction of HIV Expression by TLR-7 Antagonists	Janssen Pharm	$110,000	$8,800
Mellors, John W.	Quantifying Reversal of HIV - Latency and Elimination of Latently-Infected CD4+ T-Cells	Gilead Sciences, Inc	$118,129	$29,532
Mellors, John W.	The Effect of Multiple Doses of the TLR7 Agonist GS-9620 on the HIV-1 Reservoir in ART-Suppressed Viremic Controllers	Gilead Sciences, Inc	$60,262	$15,066
Mellors, John W.	Gilead GS-US-380-4030 Laboratory Service Agreement	Gilead Sciences, Inc	$195	$120
Nguyen, M. Hong	Efficacy and Safety of Isavuconazole Prophylaxis Among Organ Transplant Recipients	Astellas Pharma US	$87,767	$26,330
Nguyen, M. Hong	CMV infections among organ transplant patients: Efficacy and adverse events of valganciclovir prophylaxis, and risk factors for ganciclovir-resistant virus	Merck	$18,738	$5,621
Nguyen, M. Hong	In vitro activity of Ibrexafungerp	Scynexis, Inc.	$19,447	$4,862
Nguyen, M. Hong	A retrospective evaluation of fidaxomicin use at UPMC community hospitals	Merck Sharp & Dohme Corporation	$32,162	$9,648
Nguyen, M. Hong	BAL Specimens	Pattern Biosciences	$25,929	$7,779
Nguyen, M. Hong	Physician burden in managing Cytomegalovirus (CMV) infection in donor +/ recipient – kidney transplant patients	Merck	$54,326	$16,298
Nguyen, M. Hong	Physician burden in managing Cytomegalovirus (CMV) infection in donor +/ recipient – kidney transplant patients	Merck	$1,995	$0
Nguyen, M. Hong	Open-Label Study to Evaluate the Efficacy and Safety of SCY-078 in Patients with Fungal Infections that are Refractory to or Intolerant of Standard Antifungal Treatment (FURI)	Scynexis, Inc./ Duke University	$40,088	$2,146
Nguyen, M. Hong	CLSI Broth microdilution study	Pulmocide, Ltd	$35,901	$10,770
Parikh, Urvi	A Phase 1b, Randomized, Blinded, Placebo-Controlled Dose Escalation Study of the Safety and Biological Activity of GS-9620 in HIV-1 Infected, Virologically Suppressed Adults	Gilead Sciences, Inc	$17,965	$4,491
Parikh, Urvi	IPM 007 and 032	International Partnership for Microbicides, Inc.	$308,902	$92,671

INDUSTRY

INVESTIGATOR	TITLE	AGENCY	ANNUAL DIRECT COSTS	ANNUAL INDIRECT COSTS
Potoski, Brian	Observational Study Evaluating the Real-World use of Bezlotozumab	Merck Sharp & Dohme Corporation	$19,818	$4,954
Riddler, Sharon A.	A Phase 1b, Randomized, Blinded, Placebo-Controlled Dose Escalation Study of the Safety and Biological Activity of GS-9620 in HIV-1 Infected, Virologically Suppressed Adults	Gilead Sciences, Inc	$69,422	$17,355
Shields, Ryan	In Vitro Activity of Cefiderocol Against Klebsiella Pneumoniae Isolates Demonstrating Resistance to Ceftazidime-Avibactam	Shiongi Y Co., Ltd.	$9,181	$2,295
Shields, Ryan	Activity of imipenem-relebactam against ceftazidime-avibactam resistant CRE	Merck	$21,450	$5,362
Shields, Ryan	In vitro activity of cefepime plus VNRX-5133 against carbapenem-resistant Enterobacterianceae (CRE) isolated demonstrating resistance to ceftazidime-avibactam	VenatoRx Pharmaceuticals, Inc.	$29,313	$7,328
Shields, Ryan	In Vitro Activity of Meropenem-Vaborbactam Against Klebsiella Pneumoniae Isolates Demonstrating Resistance to Ceftazidime-Avibactam	The Medicines Company	$22,739	$5,685
Shields, Ryan	Plazomicin combination therapy to suppress the emergence of resistance to ceftazidime-avibactam and meropenem-vaborbactam among carbapenem-resistant Enterobacteriaceae (CRE) isolates	Achaogen, Inc.	$34,304	$8,576
Shields, Ryan	In vitro activity of cefiderocol against multiply- (MDR) and extensively- (XDR) drug resistant Pseudomonas aeruginosa clinical isolates	Shiongi Y Co., Ltd.	$13,345	$4,003
Shields, Ryan	Shionogi US Surveillance Program	Shiongi Y Co., Ltd.	$6,000	$1,800
Shields, Ryan	In vitro activity of eravacycline against carbapenem-resistant Enterobacteriaceae (CRE) isolates demonstrating resistance to ceftazidime-avibactam	Tetraphase Pharmaceuticals	$38,950	$11,685
Shields, Ryan	Clinical manifestations, healthcare utilization, and financial burden of CRE infections	Merck	$134,810	$30,810
Shields, Ryan	Pharmacokinetics of ceftazidime-avibactam among critically ill patients receiving continuous venovenous hemodiafiltration (CVVHDF), Grant 903/CAZ-IT-33	Allergan, Inc	$32,220	$8,055
		TOTAL INDUSTRY	***$1,819,844***	***$486,879***

PUBLIC HEALTH SERVICE	***$13,843,479***	***$5,590,779***
VETERANS ADMINISTRATION	***$217,112***	***$0***
OTHER FEDERAL	***$1,056,327***	***$161,881***
STATE	***$126,209***	***$0***
SOCIETY AND FOUNDATIONS	***$776,006***	***$61,009***
INDUSTRY	***$1,819,844***	***$486,879***
TOTAL	***$17,838,977***	***$6,300,548***

TEACHING ACTIVITIES

The Division continues to prioritize education by teaching medical students, medical residents, infectious diseases fellows, and doctoral students in the School of Medicine and the Graduate School of Public Health.

Medical Students

Faculty members in our division are involved with teaching medical students throughout their four years of training. Beginning in their first year, faculty members facilitate small group discussions on HIV/AIDS with first-year medical students, and teach in our highly rated Medical Microbiology course that introduces the basic science and microbiology of infectious diseases. Our faculty members are facilitators in the Advanced Physical Exam course and teach in the Evidence-based Medicine blocks and the 4th year Selective in Clinical Pharmacology. Faculty members teach in various second-year courses that focus on infections in different organ systems, and in their third-year, medical students receive an HIV didactic session during the Combined Ambulatory Medicine and Pediatric Clerkship (CAMPC). In addition to the didactic session, faculty members facilitate small group discussions on the management of HIV/AIDS in the ambulatory setting. Beginning in their third year, medical students can elect to rotate in the HIV/AIDS clinic through CAMPC where they are supervised by clinical faculty members. Both third- and fourth-year medical students can elect to rotate on the inpatient general infectious diseases (ID) consult service, as well as receive didactic teaching in antimicrobials with the pharmacology elective. A new Pandemics and Society course was designed and taught by our faculty for 3rd and 4th year medical students furloughed from clinical rotations due to COVID-19.

Medical Residents

Resident teaching primarily occurs during popular elective rotations on the inpatient general ID consult services. House staff (Medicine residents, CCM fellows, Pediatric ID fellows, Obstetrics/Gynecology Reproductive Infectious Disease fellows, Transplant Nephrology fellows, Lung Transplant fellows, HIV fellows, Adolescent Medicine fellows, and Family Medicine residents) also have the opportunity to rotate in the HIV/AIDS clinic or on the Surgical ID and Transplant ID consult services, which offers one-on-one learning opportunities with the attending physician.

Faculty members also teach courses on the control and prevention of HIV/AIDS and prevention, treatment and control of global infectious diseases in the Infectious Disease and Microbiology Department in the Graduate School of Public Health. Our faculty members also teach residents about tropical medicine and parasitology in the Internal Medicine Residency global health track.

Infectious Diseases Fellowship

The ID Fellowship Training Program continues to provide excellent clinical training and opportunities to conduct research with nationally prominent investigators. Fellows' development is carefully guided by faculty mentors and the division chief, who meet one-on-one with each fellow quarterly. Fellows spend time on the general, surgical and transplantation infectious disease consult services at the

UPMC Presbyterian, UPMC Shadyside and VAPHS sites. Away rotations in hematology/oncology and bone marrow transplantation ID are available at international training sites including the Philippines and Mozambique. Rotations at these sites are available for focusing on tropical medicine/infectious diseases.

Postdoctoral Research Training

The T32 Training Program in Antimicobial Resistance (Pitt TPAR) is currently in its second year. Two excellent post-doctoral fellows are in training in the laboratories of two Pitt TPAR mentors, Dr. James Bina and Dr. Vaughn Cooper. In the upcoming year, we anticipate filling our first pre-doctoral student slot and adding a third post-doctoral slot, which will likely be filled by one of our current infectious disease fellows.

Conferences

In addition to patient-oriented teaching, the ID division provides multiple didactic conferences:

- Weekly ID core curriculum lecture series featuring the division's finest lecturers
- Monthly ID journal club that pairs fellows with faculty mentors to optimize the fellows' presentations
- Weekly ID Grand Rounds that is the division's showcase for fellows and faculty members to discuss the diagnosis and management of a diverse range of infectious diseases
- Thrice-monthly HIV-AIDS educational conference during which students, residents, fellows and faculty members are educated about HIV treatment, drug resistance, comorbidities, coinfections, and updated on the latest topics of importance for this patient population
- Daily small group sessions with trainees at HIV clinic
- American Academy of HIV Medicine credentialing exam preparation
- Semi-monthly Transplant ID journal club and core curriculum lectures, during which fellows and faculty members are updated on the latest topics in infection prevention, diagnosis, and management in transplant recipients
- Monthly Transplant ID teleconference between UPMC, Cleveland Clinic, UNC, Mayo Clinic, University of Alberta, and the University of Sao Paolo, Brazil, whereby each institution presents a case on a rotating basis. Our ID fellows are encouraged to present
- Periodic Tropical Medicine Grand Rounds teleconference between UPMC and University of Philippines Manila
- Monthly teleconference between UPMC and Bangalore/Misore-based clinics and hospital
- Quarterly Citywide ID Grand Rounds, during which each major hospital in the city of Pittsburgh takes turns presenting a new case
- Semi-annual fellows' research-in-progress meetings, during which research objectives and results are presented to the division's faculty members and critically reviewed by the division's Academic Committee

Clinical Fellows

** Indicates departing fellow*

Edwin Chen, MD, PhD
Medical School: Washington University in St. Louis
Residency: UPMC, Pittsburgh, PA

***Will Garner, DO**
Medical School: Sidney Kimmel Medical College at Thomas Jefferson University
Residency: Case Western Reserve University, Cleveland, OH
Current Position: Transplant ID Fellow, UPMC

***Aaron Lucas, MD**
Medical School: West Virginia University School of Medicine
Residency: UPMC, Pittsburgh, PA
Current Position: Physician, Pittsburgh VA Medical Center

Nicholas Marschalk, DO
Medical School: Midwestern University Chicago College of Osteopathic Medicine
Residency: Ohio State University

Brandon Smith, MD, PharmD
Medical School: Marshall University Joan C. Edwards School of Medicine, WV 2016
Residency: UPMC Mercy

***Julia Zefirova, MD, PhD**
Medical School: Kazan State Medical University
Residency: Saint Mary's Hospital, New York, NY
Current Position: Physician, UPMC

Advanced Fellowships

***Vidya Jagadeesan, MBBS** *Transplant ID*
Medical School: MS Ramaiah Medical College
Residency: Greater Baltimore Medical Center
Current Position: UPMC

Clinical Fellow Activities

Brandon Smith, MD, PharmD

Presentations and Abstracts

- Appropriateness of Empiric Antibiotics for Enterobacteriaceae Bacteremi, poster presentation, ID Week, October 2019.
- Inappropriate Aztreonam Usage – Antimicrobial Stewardship Striks Back, poster presentation, ID Week, October 2019.
- Goldilocks and Gram-Negative Resistance: Getting Antimicrobial Stewardship Just Right (Platform presentation with Dr. Erin McCreary), ASHP Midyear, December 2019.
- Appropriateness of Empiric Antibiotics for Pseudomonas Bacteremia, poster presentation, ASHP Midyear, December 2019.
- Multidisciplinary B-Lactam Allergy Task Force: De-Labeling B-Lactam Allergies One Patient at a Time, virtual poster presentation, MAD-ID Annual Meeting, The Antimicrobial Stewardship Meeting, May 2020.
- Starry Night, Starry Bright, A Lil' Doxy Will Help You See the Light (Retracted from Virtual Poster Presentation), MAD-ID Annual Meeting, The Antimicrobial Stewardship Meeting, May 2020.

Postdoctoral Fellows and Activities

Dusan Baek, PhD

Mentor: Dimiter Dimitrov, PhD

Dr. Baek is working on 1) the construction of a high quality antibody library, 2) the screening and isolation of antibodies against disease-related targets, and 3) the construction of an scFv antibody library displayed on the surface of yeast.

Chuan Chen, PhD

Mentor: Dimiter Dimitrov, PhD

Dr. Chen is working in Dr. Dimitrov's lab on 1) production of antigens, 2) screening and isolation of antibodies against disease-related targets, and, 3) construction of mammalian cell display libraries."

Gayatri Shankar Chilambi, PhD

Mentor: Daria Van Tyne, PhD

Dr. Chilambi studies functional genomics of vancomycin-resistant enterococci in pediatric patients and bacterial evasion of innate defenses at the ocular surface.

Xiaojie Chu, PhD

Mentor: Dimiter Dimitrov, PhD

Dr. Chu is screening and isolating antibodies against disease-related targets, as well as assisting with the construction of phage display libraries.

Mitra Eghbai, PhD
Mentor: Matthew J. Culyba, MD, PhD
Dr. Eghbal investigates the control mechanisms of the bacterial DNA damage response and in-vivo evolution of S. aureus bacteremia in patients.

Alina Iovleva, MD
Mentor: Yohei Doi, MD, PhD
Dr. Iovleva studies the interplay of colistin resistance and virulence of *Acinetobacter baumannii* and is also investigating emerging resistance mechanisms in *A. baumannii* and *Enterobacteriaceae*.

Xianglei Liu, PhD
Mentor: Dimiter Dimitrov, PhD
Dr. Liu is working on the development of CH2 domain as scaffolds for constructing CH2 based antibody libraries, as well as the development of binders for CD276 for therapeutic purposes.

Savrina Manhas, PhD
Mentor: John Mellors, MD
Dr. Manhas is working on the characterization of antibody sensitivity of HIV-1 Envelope sequences from individuals harboring clonally expanded viral reservoirs to better understand mechanisms of immune evasion.

Zehua Sun, PhD
Mentor: Dimiter Dimitrov, PhD
Dr. Sun is developing stable VH domain as scaffold for constructing VH phage libraries and CD22 binders for therapeutic purposes.

Camille Tumiotto, PhD
Mentor: John Mellors, MD
Dr. Tumiotto is working on the characterization of the HIV provirus in CSF samples from HIV infected patients.

ONE-YEAR **BIBLIOGRAPHY**

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University of Pittsburgh

Department of Medicine
School of Medicine

1218 Scaife Hall
3550 Terrace Street
Pittsburgh, PA 15261

Phone 412.648.9636
Website www.dom.pitt.edu