

ANNUAL REPORT 2018–2019



University of
Pittsburgh

School of Pharmacy

Fall 2019

Dear Friends,

As we put the finishing touches on this Annual Report for FY19, I am once again flooded with pride in the accomplishments of the people of PittPharmacy, who are living the words excellence, innovation, and leadership that appear prominently in our mission. I share information that is not easily compiled from the report on the following pages.



The PittPharmacy culture of innovation drives the attitudes that leads to accomplishments, recognition, and national leadership of our people. PittPharmacy truly dominated at the 2019 American Association of Colleges of Pharmacy Annual Meeting, where we received two awards, and faculty took four prominent leadership roles.

Specifically, Susan Meyer received the Robert K. Chalmers Distinguished Educator Award, while P2 student pharmacists won the National Award for Script Your Future. Both awards were presented at the Plenary Session, leaving quite an impression of PittPharmacy. Dr. Meyer's award marks the tenth national or international award to PittPharmacy faculty for excellence and innovation in teaching since 2012. The award to students is the fifth consecutive annual award for Script Your Future in either the top award (twice) or sub-award (three times). No other program in the country can top this record of achievement in education.

Leadership positions tell the same story. Melissa McGivney is the AACP presidential appointee to lead the national Community Pharmacy Practice Transformation Initiative, which is a coalition among the 43-state Community Pharmacy Enhanced Practice Networks and potentially all colleges of pharmacy through AACP. Sam Poloyac is chair of the AACP Council of Deans Taskforce to develop competencies for PhD programs; Neal Benedict is chair of the Assessment Special Interest Group. And Phil Empey and Jim Stevenson led the Test2Learn Pharmacogenomics Certificate and Train-the-Trainer sessions. While some schools may have had a number of presentations, none were cumulatively of the stature and quantity as those of PittPharmacy.

PittPharmacy shines and leads other than at AACP. Amy Seybert is now an appointed member of the Accreditation Council for Pharmacy Education. And in a first-ever accomplishment for any pharmacy students, three PittPharmacy students designed an experiment that will be conducted simultaneously on the International Space Station (microgravity) and on earth (gravity).

Why else am I pleased? Well, PharmD students had an 84.2% national match rate for residency program placement, the third highest in the country. The national match rate is 65%. As part of our plan to "Build Healthy and Engaged Communities," PittPharmacy signed a partnership with the Allegheny County Health Department, with the goal of developing medication- and vaccine- based programs that will enhance the health of the citizens of Allegheny County. And finally, PittPharmacy admitted the PharmD class with the highest ever percentage of minority students—10.4%.

So now let's keep innovating and leading in FY20! Hail to Pitt!

Handwritten signature of Patricia D. Kroboth in cursive script.

Patricia D. Kroboth, Dean

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The Plan for Pitt	
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Leading Pharmacy Education



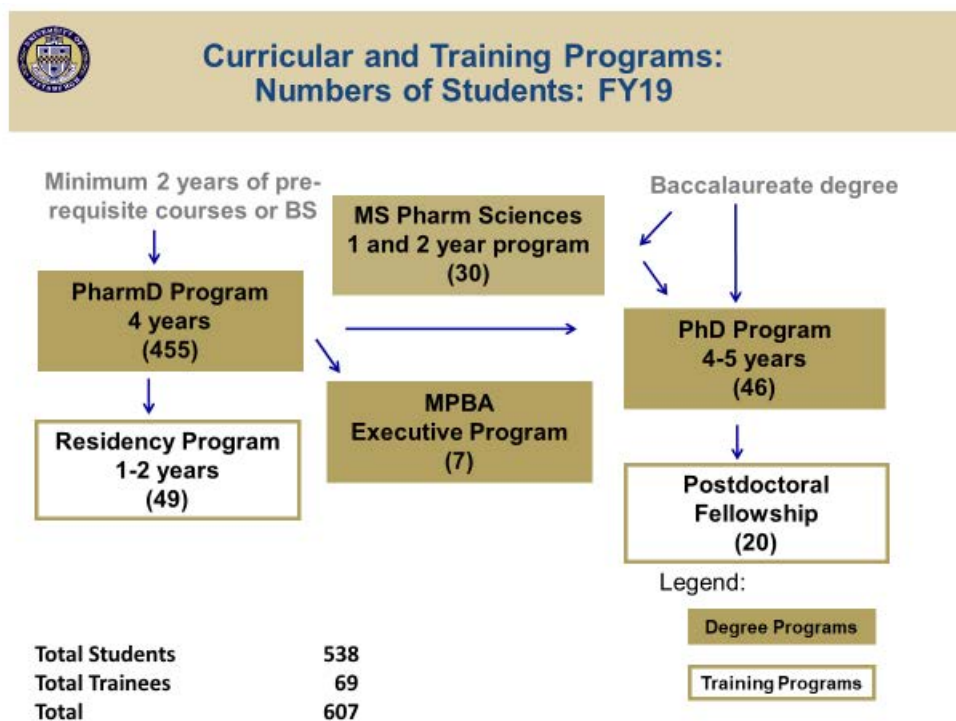


Leading Pharmacy Education

PittPharmacy builds on its rich tradition of excellence in education, producing innovators to solve the complex medication-based problems of today and tomorrow and to enhance the health and well-being of individuals and communities.

The School of Pharmacy has adopted two broad goals for our PharmD, residency, and graduate programs - **Personalizing Education** and **Getting to Expert Faster**.

The chart below shows the number of students and trainees in each of our programs in FY19; it also shows the usual pathways to each degree or training program.

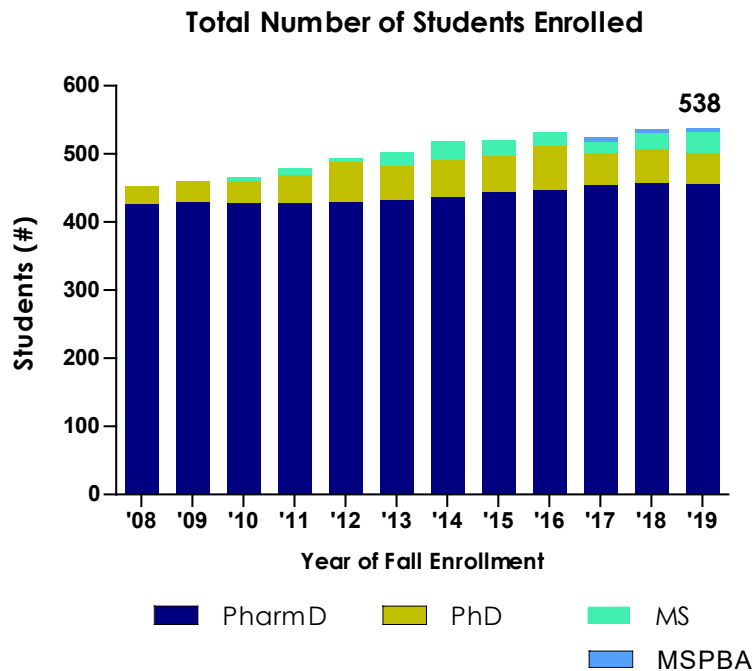


EDUCATION BY THE NUMBERS FOR FY19

- The total number of students in degree granting programs reached 538. When combined with resident and post-doctoral trainees (69), the grand total is 607.
- **69** full-time faculty members educate students in the professional and graduate programs.

PharmD Program By The Numbers

In FY19:



- **115** students matriculated for the PharmD class of 2023; average GPA and PCAT scores of 3.58 and 83%, respectively.
- **3.6** –The number of applicants per seat through open admission.
- **176** scholarships awarded to **144** PharmD students who received a total of **\$600.84**.
- **9** national or regional awards to University of Pittsburgh pharmacy student organizations.
- **88** PharmD students presented **64** posters at **3** national and regional meetings.
- **407** pharmacists in **29** states and **10** countries provided **915** APPE rotations for **114** fourth professional year students.
- **31** students in the Class of 2019 completed APPE rotations in the Indian Health Service.
- **115** students graduated with the PharmD degree.
- **85** students chose to receive the Bachelor of Science in Pharmaceutical Sciences after their second professional year.
- **120 (35%)** of **342** students in the P2, P3, and P4 years were enrolled in Areas of Concentration.
- **25** P4 students had international APPE rotation experiences in 9 countries and **8** P1, P2, and P3 students had international experiences.

Residency Program

In FY19:

- **49** incoming residents (**33** PGY1 and **16** PGY2) came from **25** schools of pharmacy in **17** states.
- The **11** residency programs were in partnership with **14** institutions/entities.
- **16** residents presented their research results at national or regional meetings.
- **24** residents participated in training programs to enhance their teaching and clinical precepting skills.
- **16** residents were accepted into PGY2 specialty programs and **2** were accepted into a fellowship program.
- **2** residents accepted faculty positions at schools of pharmacy.
- **5** residents passed the Board Certified Pharmacotherapy Specialist Exam during their residency. Once they are eligible, **8** plan to take their specialty board certification.
- Of **19** residents taking clinical positions, **13** accepted clinical positions at an academic medical center, **5** of which were in the UPMC Health System; **3** accepted positions in community hospital settings, **2** in managed care, and **1** in independent pharmacy.

Graduate Program

In FY19:

- **76** full-time students were enrolled: **46** PhD students; **30** Master of Science students.
- **14** MS and **17** PhD degrees were awarded.
- **24%** (**11/46**) of the full-time PhD students are U.S. citizens or permanent residents.
- **65%** (**30/46**) of the full-time PhD students have degrees from schools of pharmacy
- **66** peer-reviewed publications published by graduate students.
- Graduate students gave **31** presentations at regional and national scientific meetings.
- **20** postdoctoral fellows were engaged in research in School of Pharmacy laboratories.

BS IN PHARMACEUTICAL SCIENCES

In April of 2019, 85 students elected to receive the Bachelor of Science in Pharmaceutical Sciences after their second professional year of the PharmD Program.

THE PHARM D PROGRAM

Accreditation from the Accreditation Council for Pharmacy Education (ACPE)

In 2016, an ACPE evaluation team visited the School of Pharmacy and based on the School's Self Study and the Evaluation Team Report, the Board of ACPE awarded the PharmD Program the full eight-year term of accreditation (June 2017 through June 2025).

The Value of a PharmD Education

PittPharmacy has employed several approaches to assure the quality and value of the PharmD education including;

- personalizing education;
- deploying instructional approaches to “get our students to expert faster;”
- adopting the philosophy of “cost of PharmD education” vs. the credit-based tuition. Through the “cost” mechanism, students may take courses above a standard credit limit and during the summer with no additional tuition;
- and designing instructional environments that facilitate active engagement and learning.

1. Personalizing Education

We believe that personalized education will enrich individual student experiences and will better prepare them for success as they navigate the rapidly changing health care landscape and post-graduate environment.

Long Range Plan 2012

The faculty is enabling students to personalize their education through a growing array of opportunities.

- A. Areas of Concentration
- B. Special Topics
- C. Presentations of Research at Regional or National Meetings
- D. International Experiences
- E. Professional Development through Advising
- F. A wide array of electives

A. AREAS OF CONCENTRATION (ARCOS)

In FY19:

- PittPharmacy continued eight Areas of Concentration (Community Leadership, Innovation, and Practice; Geriatrics and Palliative Care; Global Health; Pediatrics; Pharmacoanalytics; Pharmacotherapy Scholars; Pharmacy Business Administration; Research).
- One hundred twenty (120) or 35% of 342 P2, P3 and P4 students enrolled in Areas of Concentrations.

Area of Concentration	Number of P2 students enrolled	Number of P3 students enrolled	Number of P4 students enrolled	Total Enrollment (Number)
Community Leadership, Innovation, and Practice		9	13	22
Geriatrics and Palliative Care	1	7		8
Global Health	2	12	11	25
Pediatrics		4	3	7
PharmacoAnalytics		4	1	5
Pharmacotherapy Scholars		16	16	32
Pharmacy Business Administration		8	2	10
Research		6	5	11
Total Across All Years and ARCOs	3	66	51	120

B. SPECIAL TOPICS

During FY19, **109** students enrolled in **168** Special Topics courses.

Special Topics elective courses allow students the opportunity to personalize their education by engaging in a mentored experience in a particular area of pharmaceutical science, pharmacy practice, or pharmacy education under the direction of a faculty member. Special Topics courses may be designed for one, two, or three credits each.

C. STUDENT PRESENTATIONS AT NATIONAL AND REGIONAL MEETINGS

88 PharmD students presented **64** posters at **3** national and regional meetings in FY18. See Education Appendix for details.

D. STUDENT PROFESSIONAL DEVELOPMENT

Advising and career development are key to the School's goal of personalizing education.

Career Learning and Advising. In FY19, Career Learning and Advising groups engaged all P1, P2, and P3 students. Faculty advisors work with the same students throughout the years of the curriculum to create a community of learners and near-peer mentors within each Career Learning and Advising group. Faculty mentors are drawn from both departments have expanded from program inception from 23 to 44 faculty members.

Portfolios. Since the 1990s, PittPharmacy has used portfolios as a means for students to demonstrate achievement. Students use a customized e-portfolio platform to show integration of learning across courses and progressive development across the curriculum. P1 and P2 students meet each term with portfolio advisors and receive mentoring and feedback on progress.

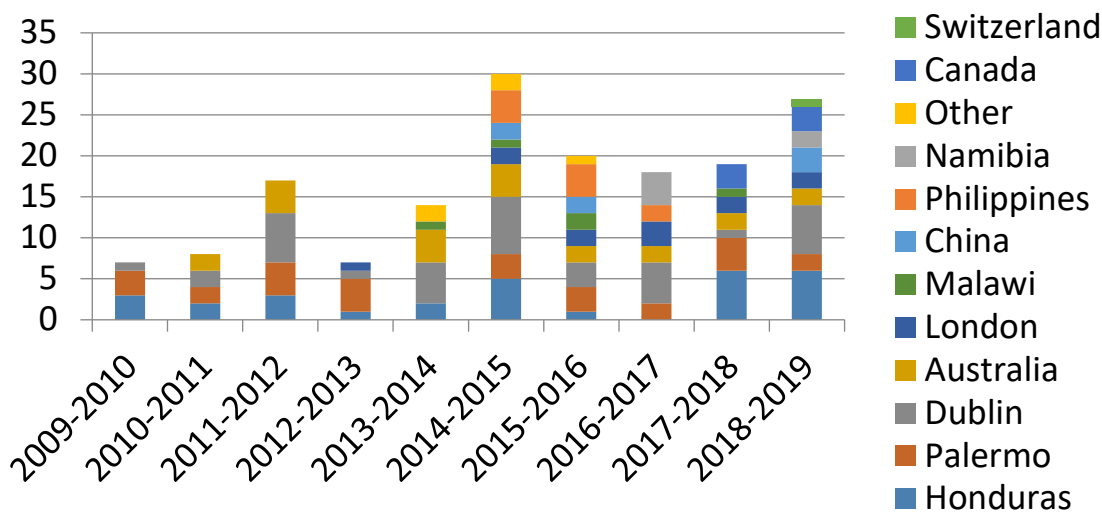
P3 and P4 students use professional presentation portfolios in preparation for interviews. Every P3 and P4 student meets with either a faculty member or practitioner for focused career planning and mentoring.

E. INTERNATIONAL EXPERIENCES

In FY19, a total of 33 students had international academic experiences.

- 8 students (P1, P2 and P3) engaged in international experiences.
 - Two P1 and five P2 students traveled to Namibia for two weeks in May to work with the University of Namibia. All students were enrolled in the International Pharmaceutical Student's Federation (IPSF).
 - One P3 student went to Argentina through the Student Exchange Program (SEP), a program sponsored by the IPSF.
- Twenty-five students chose international APPE rotation experiences, across 9 countries.
- Pitt faculty hosted 1 student from Singapore for the SEP through the IPSF

P4 International Rotations FY10 – FY19



2. Getting to Expert Faster

PittPharmacy has taken a number of steps to increase the value of the education. See Education Appendix for detailed explanation.

PittPharmacy's Readiness Assessment received the national Excellence in Assessment Award in FY17 from the American Association of Colleges of Pharmacy and the PittPharmacy and WISER Center authors of a manuscript on the approach, including cohort comparisons, were awarded the Rufus A. Lyman Award for the best paper in the *American Journal of Pharmaceutical Education* in FY2018. This assessment is now part of PittPharmacy's comprehensive assessment program. Data are used to inform student-specific education plans, as well as improvements to the curriculum to accelerate student development.

FY19 PATIENT CARE EXPERIENCES

INTRODUCTORY PHARMACY PRACTICE EXPERIENCES (IPPEs)

Student experiences with patients depend greatly on preceptors, some of whom are faculty.

- 38 preceptors supervised 112 P1 students (Class of 2022).
- 94 preceptors supervised 114 P2 students (Class of 2021).
- 125 preceptors supervised 113 P3 students (Class of 2019).

Students interact with patients in the P1, P2, P3 and P4 years; in the P3 year students also study operational and advanced practice aspects of health-system pharmacy.

In FY19 in the **Community Pharmacy Practice 2** course,

- 114 P2 students documented 4,190 patient encounters in their community pharmacy practice experiences, identifying 1,670 drug therapy problems and delivering 512 enhanced services.

In national patient care campaigns, PittPharmacy students who engaged in Script Your Future had:

- 1,600 patient encounters in the medication adherence initiative;
- 570 patients educated on immunizations and 216 patients immunized;
- 1,118 in “Be Antibiotics Aware”, a program focused on antibiotic awareness.

The PittPharmacy Class of 2021 was awarded the national Script Your Future National Award at the 2019 American Association of Colleges of Pharmacy Annual Meeting in Chicago, IL. This is the 6th year PittPharmacy participated in this campaign, and the 6th national award earned by PittPharmacy students.

SilverScripts is a longitudinal Introductory Pharmacy Practice Experience for first- and second-year student pharmacists. SilverScripts provides an early immersion experience for students to practice pharmaceutical care with older adults at senior community centers in Pittsburgh. At four unique visits (Feb/Mar/Oct/Nov), students offer comprehensive medication reviews, targeted medication reviews, and blood pressure assessments to help seniors manage their medications. Students are precepted on-site by more than 25 participating PittPharmacy faculty, residents, and fellows.

SilverScripts Program Impact during FY19

SilverScripts Spring FY19 P1/P2 Students	
Comprehensive Medication Reviews	254
Targeted Medication Reviews	25
Patients Screened for Hearing Loss	13
Patients Receiving Point-of-Care Testing	10
Patients Receiving Dental Hygiene Kits	30
Patients Vaccinated	7

Pill Boxes Distributed	21
Medication Disposal Envelops Distributed	42
Blood Pressure Assessments	517
Referrals to Other Health Care Providers	30
Total Unique Encounters	569
Total Unique Senior Centers	12

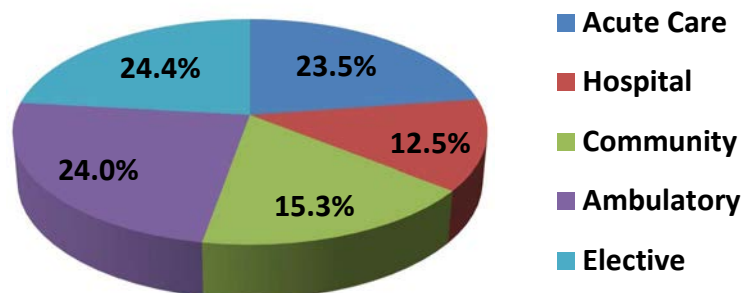
Advanced Pharmacy Practice Experiences (APPEs).

In their P4 year, students interact with patients in a variety of settings. Results from the PITT form for tracking show the impact of students on patients in various settings.

P4 Class Patient Impact FY19	
Patient Interactions	30,439
Drug Therapy Problems Identified	20,019
Drug Therapy Recommendations	20,871
Adverse drug events identified	774
Adverse drug events averted	1,012

In FY19, 401 preceptors supervised 114 P4 students during 915 five-week rotations. The types and proportions of rotations are shown in the pie chart.

APPE Distribution by Rotation Type



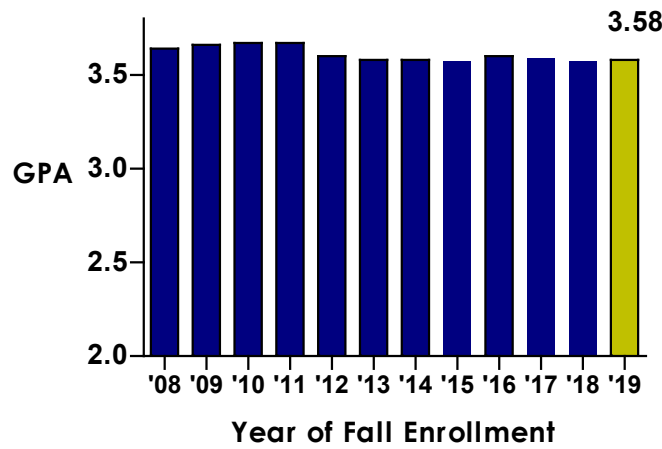
Students

RECRUITMENT AND ENROLLMENT

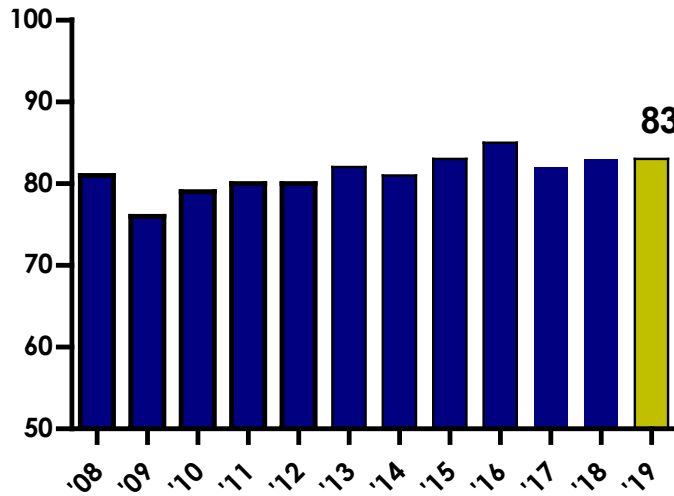
Great programs start with great students. PittPharmacy continues to find the best and brightest to become the future innovators and leaders of pharmacy.

The work of the Admissions Committee and faculty and staff who interviewed applicants resulted in an excellent group of 115 newly admitted students for the class of 2023.

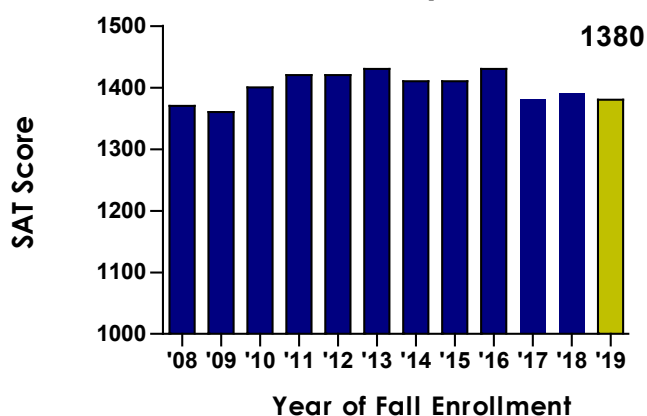
Entering PharmD Class GPA



PCAT Composite Score



SAT Scores of P1 Students As Freshmen: Early Assurance



In previous years, the Annual Report captured the average SAT scores for the entering PharmD students who submitted SAT scores. Since the SAT is not required for our open admission application, we have chosen to report the average scores only for the students who matriculated as a result of the Guarantee Admit (high school process).

During FY19, we recruited the class of 2023 for fall enrollment.

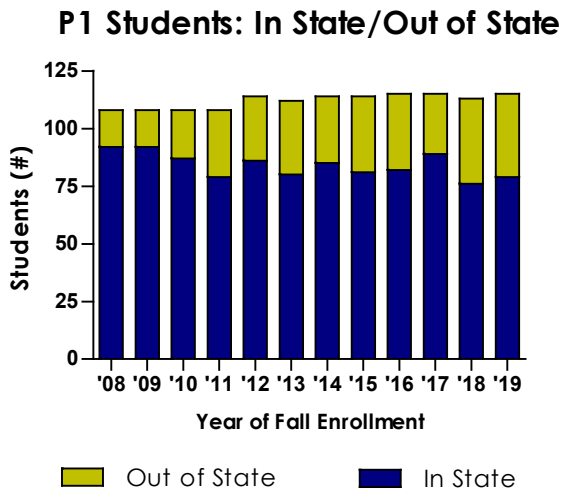
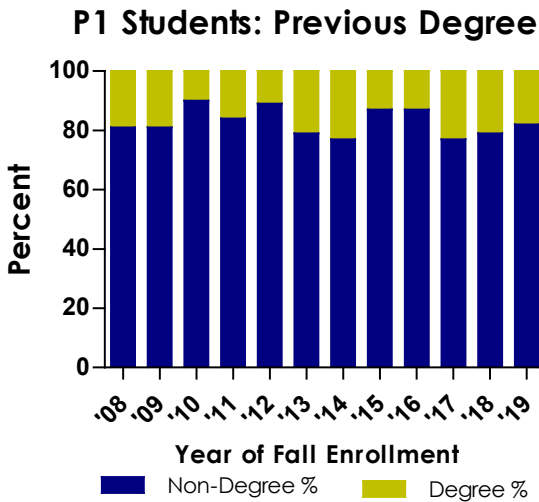
- Pharmacy guaranteed admissions to the class of 2023
 - 61 students applied for PharmD program; 60 after sophomore year and one after freshman year.
 - 62 were interviewed.
 - 54 met the guarantee admission criteria and were offered admission.
 - 53 accepted the offers.
- Open admissions to the class of 2023.
 - 210 applied to the PharmD program.
 - 160 were invited to interview.
 - 48 declined to interview.
 - 4 were no-shows for interviews.
 - 108 were interviewed.
 - 101 were offered admission, including 5 pharmacy guarantee applicants who competed in open admission.
 - 62 accepted the offers.

Of the students in the class of 2023, 33% are men and 67% are women (compared to 37% and 63%, respectively, in the class of 2022); 10% are from an underrepresented minority (5% in the class of 2022).

First-Year (P1) Class Enrollments 2002-2019

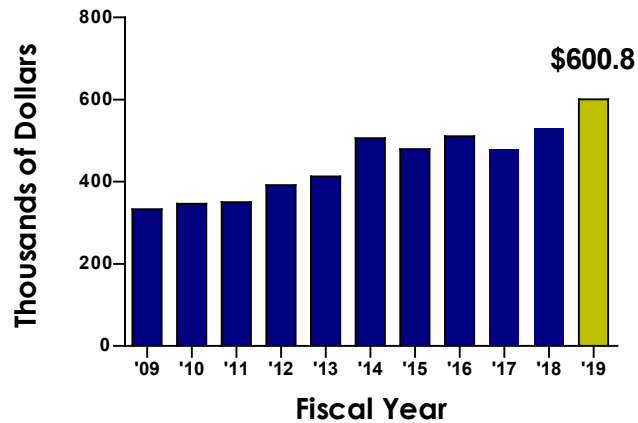
Fall Term	Residency Status		Application Pathway*					Students with 4-Year Degree (% of class)
	PA (%)	Non-PA (%)	Early Assurance	Educational Institution or Type for Students Accepted through Open Admission				
				Pitt	Community College	AAU-member Institution	Other	
2002	92	8	37	37	5	5	12	16
2003	86	14	36	38	3	7	18	13
2004	85	15	52	28	0	4	13	15
2005	92	8	60	28	0	8	6	13
2006	87	13	50	44	1	3	10	11
2007	88	12	42	53	0	4	9	15
2008	86	14	47	42	0	2	17	19
2009	85	15	51	39	0	4	11	19
2010	81	19	47	51	0	2	9	11
2011	73	27	49	44	0	5	9	16
2012	77	23	54	46	0	1	11	8
2013	71	29	45	50	1	7	9	21
2014	75	25	43	46	0	10	14	23
2015	71	29	46	56	1	5	6	*15
2016	69	31	39	61	0	4	11	13
2017	77	23	47	46	0	12	10	21
2018	67	33	56	40	3	3	11	18
2019	69	31	53	41	0	7	14	18

*Total across Applications Pathway sums to the total students enrolled



SCHOLARSHIP SUPPORT FOR STUDENTS

Scholarship Awards from PittPharmacy



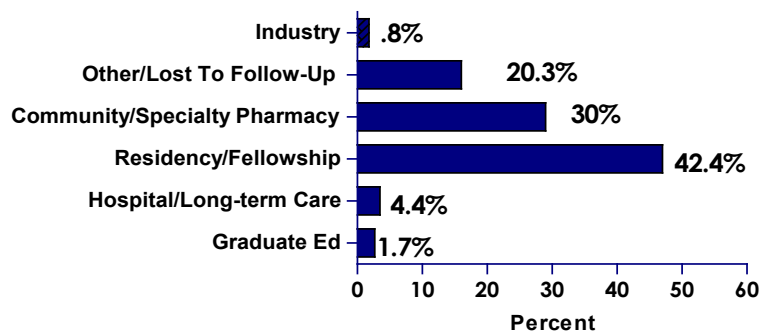
GRADUATING CLASS OF 2019

In April 2019, 114 students were awarded the PharmD degree; one student was awarded the PharmD degree in August of 2018.

93.1% of PittPharmacy graduates taking the North American Pharmacist Licensure Exam (NAPLEX) for the first time in calendar 2018 passed on their first attempt and 96.4% passed the Multistate Pharmacy Jurisprudence Examination on their first attempt. School graduates have consistently exceeded national averages for scores and pass rates on these two examinations.

49.7% of the class of 2019 continued training in a post-PharmD residencies or fellowships. Other graduates obtained employment in a variety of pharmacy practice settings.

Class of 2019



Comparison of NAPLEX Pass Rates: First-Time Candidates

Year	Pitt Candidates Pass/Total	Pitt Pass Rate (%)	National Pass Rate (%)
2019	108/116	93.1	88.5
2018	98/106	92.5	87.6
2017	98/106	92.5	87.6
2016	100/110	90.9	87.3
2015	107/108	99.0	92.6
2014	102/102	100	94.4
2013	104/107	97.2	95.4
2012	106/106	100	96.4
2011	103/105	98.0	96.6
2010	104/107	97.2	91.5
2009	102/102	100	97.5

Comparison Multistate Pharmacy Jurisprudence Examination® (MPJE®) Results:

Year	Pitt Candidates Pass/Total*	Pitt Pass Rate (%)	National Pass Rate (%)
2019	81/84	96.4	82.6
2018	82/85	96.5	88.1
2017	82/85	96.5	88.1
2016	89/93	95.7	84.1
2015	82/83	98.8	93.5
2014	95/96	99.0	93.15
2013	83/84	98.8	92.8
2012	91/91	100	92.5
2011	89/89	100	95.6
2010	70/73	95.9	93.9
2009	77/77	100	92.1

* Includes University of Pittsburgh School of Pharmacy graduates taking the MPJE® in Pennsylvania as a first-time candidate.

Student Selections of Faculty for Awards

Students in the P1 through P4 years select faculty members and preceptors who are exceptional role models and who have made outstanding teaching contributions during the year for various teaching awards. The FY19 awardees were:

- **Stanford I. Cohen Teacher of the Year (selected by the graduating class).** Randall B. Smith, PhD, Senior Associate Dean, Professor, Pharmaceutical Sciences.
- **Faculty Member of the Year (selected by the members of APhA-ASP).** Melissa A. Somma McGivney, PharmD, FCCP, FAPhA, Associate Dean for Community Partnerships, and Professor, Department of Pharmacy and Therapeutics.
- **Faculty Preceptor of the Year (APPE).** Neal J. Benedict, PharmD, and Associate Professor, Department of Pharmacy & Therapeutics.
- **Volunteer Preceptor of the Year (APPE).** Brian Baum, PharmD, MS Toxicology, MBA, BCPS, BCCCP, Unit-Based Clinical Pharmacist, Emergency Department, UPMC Presbyterian.

- **Preceptor of the Year (IPPE).** Kathleen Contestabile, PharmD, BCOP, Oncology Clinical Pharmacist, UPMC Hillman Cancer Center, Moon/Sewickley.

PROFESSIONAL DEVELOPMENT: EDUCATING THE NEXT GENERATION OF PRACTITIONERS

Online Continuing Education for Practitioners

Preceptor Development Home Study Modules

This year, the Experiential Learning Program continued expansion of its on-line, ACPE-accredited, home study continuing education modules for preceptors. The content is focused on principles and practices for successful precepting and experiential education. To date, 174 preceptors and interprofessional health care clinicians enrolled to complete one or more of the following modules:

- An Introduction to Precepting at Pitt Pharmacy
- Leading the Way in Experiential Education
- Preceptor Roles and Responsibilities
- Creating (and Improving) Your Rotation
- Providing Student Feedback and Evaluations
- Integrating the Patient Care Process into Daily Practice
- Do You Have Time to Speak to the Pharmacist? Initiating Conversations About Substance Use
- Precepting: The Pharmacy Student Perspective
- Assessing Student Performance in Experiential Learning: The PittPharmacy Mastery Scale
- Opioid Overdose: Background, Statistics, and Use of Naloxone
- Preventing and Treating Opioid Use Disorders

Live Continuing Education for Practitioners

The School of Pharmacy partnered with the UPMC Center for Continuing Education in the Health Sciences (CCEHS) to deliver live continuing education programs in FY19:

Fall Continuing Education Seminar

“Medical Marijuana in Pennsylvania: The Science Behind the Stigma” featured presentations by Eric Hauser, RPh, Brian Bobby, PharmD, from Organic Remedies, and Michael Zemaitis, PhD, from the University of Pittsburgh Schools of Pharmacy and Medicine. The program was held on Sunday, October 21, 2018, and was attended by 107 participants. The intent of this program was to educate attendees regarding medical marijuana as it relates to mechanism of effect therapeutic benefit, dispensary operations, health care provider collaboration, and provisions for research.

Spring Continuing Education Seminar

“Diabetes Management Across the Continuum of Care” featured presentations by Amy Calabrese Donihi, BS, PharmD, BCPS, FCCP, from the University of Pittsburgh School of Pharmacy and UPMC Diabetes Patient Safety, and Nicole Pezzino, PharmD, BCACP, CDE, from Wilkes University and Weis Pharmacy. The program was held on Sunday, May 5, 2019, and was attended by 51 participants. The intent of this program was to educate attendees regarding the management of diabetes across the patient care continuum, including the inpatient and outpatient settings, and safe transitions of care with medications and monitoring devices.

Community Leadership, Innovation, and Practice (CLIP) Workshop Series

The CLIP Workshop Series is open to preceptors and practicing pharmacists for continuing education credit. The workshops, which are run like one-day national meetings with a keynote speaker, are required for P2 students.

- January 11, 2019: “Pharmacy Innovations: Technology Today and Beyond” featured presentation by David Pope, PharmD, CDE, Chief Innovation Officer, Co-Founder, STRAND, Athens, GA. 127 pharmacists and student pharmacists attended. CE Credit: 7
- February 1, 2019: “Public Health: How Pharmacists Can Contribute” featured presentation by Karen Hacker, MD, MPH, Director, Allegheny County Health Dept. 240 pharmacists and student pharmacists attended. CE Credit: 0 - wasn’t offered
- March 1, 2019: “Medication Therapy Management Innovations Nationwide” featured presentation by Margie Snyder, PharmD, MPH and Omolola Adeoye, PharmD, Purdue University, Indianapolis, IN. 132 pharmacists and student pharmacists attended. CE Credit: 7
- April 12, 2019: “Community Pharmacy Innovations Panel” featured presentation by Chris Antypas, PharmD, President and COO Asti’s South Hills Pharmacy, Jim Tsipakis, RPh, Senior Vice President, Giant Eagle Pharmacy, and Stephanie McGrath, PharmD, Executive Director, Pennsylvania Pharmacy Care Network (PPCN). 133 pharmacists and student pharmacists attended. CE Credit: 0 – was not offered

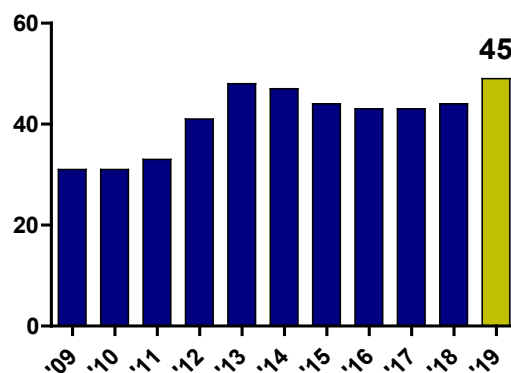
RESIDENCY PROGRAM: EDUCATING THE NEXT GENERATION OF PRACTITIONERS

The School of Pharmacy partners with health care provider organizations to support outstanding residency training programs in research and teaching. The School provides three programs to enhance the training provided at each residency site:

- Resident Seminars
- Teaching Mastery
- Resident Research Series

Additional information can be found in the Education Appendix.

Residency Program - FY19



GRADUATE PROGRAM: EDUCATING THE NEXT GENERATION OF SCIENTISTS

Graduate Program in Pharmaceutical Sciences

This program prepares students for positions in academia, government, non-governmental organizations, and industry. The School of Pharmacy offers three degrees:

- the Doctor of Philosophy (PhD),
- the thesis-based Master of Science (MS),
- the 12-month, non-thesis-based MS (NTMS).

Each degree program offers five tracks:

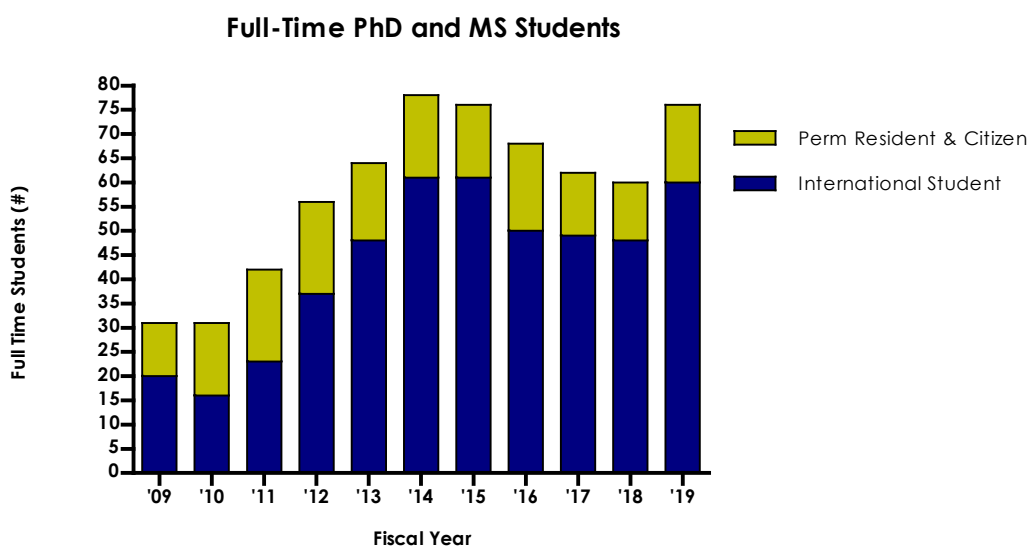
- biochemical pharmacology,
- medicinal chemistry,
- pharmaceuticals,
- clinical pharmaceutical sciences (a specialized program to train students in clinical and translational science),
- pharmaceutical outcomes and policy research.

ADMISSION AND ENROLLMENT DEMOGRAPHICS

The total number of students enrolled in the pharmaceutical sciences graduate program during FY19 included **76** full-time and **2** part-time students. Of the part-time students, **1** was enrolled in the PhD program and **1** in the NTMS program.

Of the 76 full-time students: **46** are PhD students and **30** are Master of Science students.

- **24% (11/46)** of the PhD students are U.S. citizens or permanent residents.
- **65% (30/46)** of the PhD students have degrees from schools of pharmacy.
- **4** students passed the comprehensive examination and **6** achieved PhD candidate status.



FY19 Admission Demographics

- The school received 71 applications for the PhD program, 73 for the MS program and 5 for the non-thesis MS.

- 16 PhD students received admission offers; 7 accepted (44% yield).
 - 2 of the 9 deferred to the 2019-2020 academic year
 - 5 of the 9 are US citizens.
 - 3 of the 9 has a PharmD degree.
- 27 MS students received admission offers and 12 students accepted (44% yield)
- No NTMS students were offered admission.

FY20 Admission Demographics

- The school received 101 applications for the PhD program, 50 for the MS program and 6 for the non-thesis MS.
- 22 PhD students received admission offers; 16 enrolled (72% yield).
 - 6 of the 15 are US citizens.
 - 4 of the 15 have a PharmD degree.
 - One is a part-time student.
- 29 MS students received admission offers and 13 students enrolled (45% yield)
- No NTMS students were offered admission.

Students completing Graduate Degrees in 2018-2019

In FY19,

- 18 students completed Master of Science degrees.
- 17 students completed PhD degrees.

A comprehensive listing of all graduates can be found in the Education Appendix.

Awards to Graduate Students

In FY19, graduate students received 27 awards including:

- 12 research or presentation awards.
- 7 competitive fellowships.
- 4 travel awards.
- 4 other awards.

A comprehensive listing of all awards can be found in the Education Appendix.

Graduate Student Publications and Presentations

In FY19, the research efforts of our graduate students resulted in:

- 66 publications.
- 31 presentations, posters, and podium presentations.

A comprehensive listing of all publications and presentations can be found in the Education Appendix.

Master of Science in Pharmacy Business Administration Program

The Master of Pharmacy Business Administration Program, (MPBA) is designed for experienced pharmacy professionals striving to lead in the business of medicines. The curriculum provides a balance among courses in pharmacy business administration, finance, leadership, strategy, productivity, and data analytics.

Enrollment demographics for the MPBA Program

Since the inception of the program in January 2016, the MPBA has graduated 20 students residing in six different states. Beginning in July 1, 2018, the MPBA class consisted of seven students. The average

age was 35 years old. All seven students successfully graduated from the Program in December 2018. Six students enrolled in the Specialty Pharmacy management area of focus, and one student enrolled in the Community Pharmacy Management of Focus.

The current MPBA class consists of seven students, six domestic and one international. The average age of the 2019-2020 class is 37 years old. Four students are enrolled in the Specialty Pharmacy Management, one student enrolled in Community Pharmacy Management, and two students enrolled in the Pharmacy Benefits Management areas of focus.

Since its inception in 2016, 20 students have graduated from the MPBA Program and are residents of six different states.

The Master of Pharmacy Business Administration Program Develops

In November 2018, The Executive Board Steering Committee introduced new board members at the November 2018 on-site meeting. The Executive Board is proud to welcome Russ Allinson, Shelia Arquette, Greg Drew, Phyllis Kidder, Sarah Marche, Matt Sarnes, Don Vidic and Tim Wentworth to the leadership team.

In April 2018, the Graduate Ambassador Program was launched at an alumni gathering. The purpose of the Graduate Ambassador Program is to invite MPBA alumni to play an integral role in the program while interacting with the program director, faculty, staff, students and alumni.

Beginning in May 2019, the MPBA furthered their collaboration with the Katz Graduate School of Business by partnering with the Executive MBA (EMBA47) class. The program launched with a joint learning community workshop, followed by a full immersion week course of Organizational Behavior. Continuing into the weekend courses, the students continue attending classes with Financial Accounting and are enrolled in the joint class of Financial Management in the Fall of 2019. Students from both programs have benefited by the diversity of background and industry experience, along with widening of their professional network.

C-suite executives continue supporting the MPBA through their involvement in the Graduate Executive Boardroom course. The MPBA students gain a real-world education through an engaging environment with these titans in the industry.

The MPBA is committed to creating a curriculum that provides a blend of synchronistic and asynchronistic teaching environment, limiting the on-campus time commitment. Future development will allow the University of Pittsburgh School of Pharmacy MPBA program to grow the program nationally and internationally, providing world-wide education for tomorrow's leaders in the business of medicines.

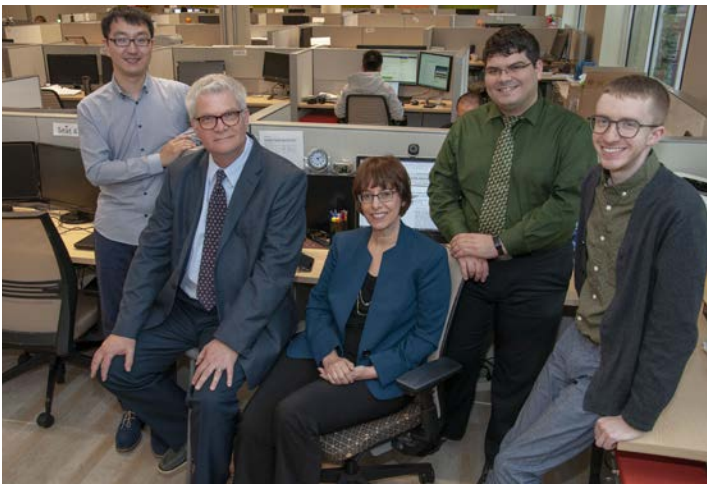
POSTDOCTORAL FELLOWS

In FY19, the School of Pharmacy hosted **20** postdoctoral associated from **17** universities in **5** countries.

A comprehensive listing of all postdoctoral associates can be found in the Education Appendix.

Engage in Impactful Research





Engage in Impactful Research

The overall goal of the School of Pharmacy’s research programs is to advance human health through a portfolio of research that ranges from computational drug discovery to preclinical development to patient outcomes. Supported by diversified funding sources, School of Pharmacy investigators are using state-of-the-art techniques to answer important questions leading to new drug targets and improved drug therapy. Faculty are identifying sources of variability to improve patient outcomes and creating evidence-based guides for therapy. The quality of the science is shown through successful competition for NIH and other funding to support research.

RESEARCH BY THE NUMBERS FOR FY19

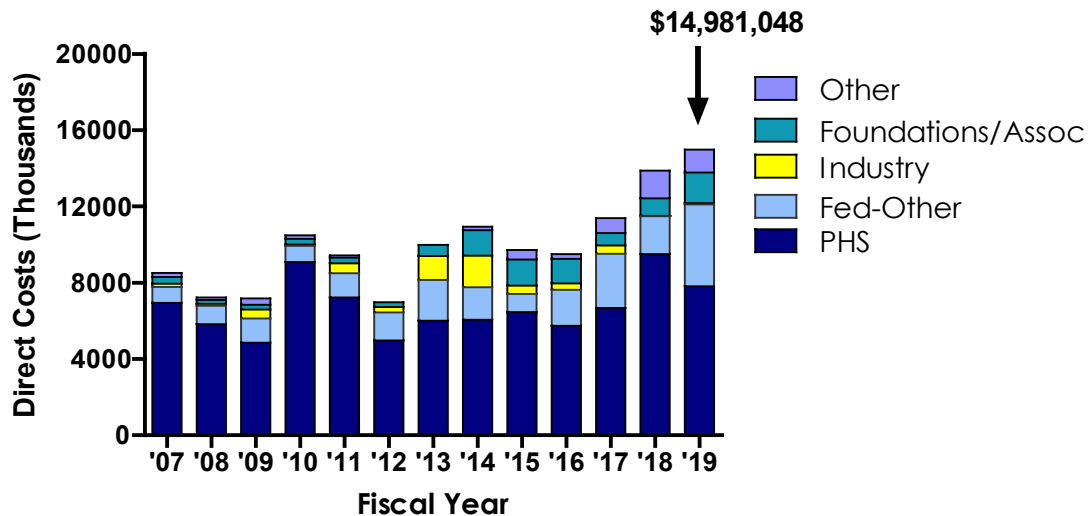
- Funded research projects generated **\$20,650,006** in total support (**\$14,981,048 million** in direct costs and **\$5,668,957** in indirect costs).
- PHS research funding was **\$7,809,574** in direct costs and **\$3,248,272** in indirect costs.
- **95**: the number of active research projects.
- **#15** among schools of pharmacy in NIH support for FY18 with **\$10.2 million** in funding (**#11** in overall funding and **#7** in non-federal funding).
- **31** faculty members were principal investigators.
- **213** publications in peer-reviewed journals
- Measures of innovation
 - 12 Invention Disclosures
 - 9 U.S. Patents Issued
 - 10 U.S. Patent Applications Filed and 4 PCT Applications Filed
 - 3 Deals (Licenses, Options, other Agreements recorded by the Innovation Institute as an FY19 Deal)

RESEARCH FUNDING

Direct Costs for Research by Funding Category

Source	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
PHS	\$4,967,911	\$6,006,199	\$6,058,477	\$6,450,467	\$8,086,476	\$9,739,330	\$13,214,050	\$7,809,574
Federal-Oth	\$1,469,405	\$2,143,548	\$1,702,706	\$967,894	\$2,457,285	\$3,474,942	\$2,794,793	\$4,291,225
Industry	\$289,323	1,253,199	\$1,649,131	\$425,862	\$518,591	\$545,485	\$22,438	\$70,558
Found/Assoc	\$249,664	\$584,447	\$1,347,135	\$1,363,123	\$1,438,406	\$662,703	\$1,030,821	\$1,604,890
Other	0	0	\$180,224	\$507,487	\$307,551	\$908,172	\$1,746,873	\$1,204,801
TOTAL	\$6,976,303	\$9,987,393	\$10,937,673	\$9,714,833	\$12,808,309	\$15,603,632	\$18,808,975	\$14,981,048

Direct Costs: Research Funding



RESEARCH OVERVIEW

PittPharmacy is home to nine centers, through which the people of the School conduct much of the research. Significant accomplishments for five of the centers appear in this section, while summaries of the other two appear in the section entitled “Strengthening Communities.”

Centers summarizes on these pages include:

- Center for Pharmacogenetics
- Center for Clinical Pharmaceutical Sciences
- Community Leadership and Innovation in Pharmacy (CLIP) Center
- National Center of Excellence for Computational Drug Abuse Research (CDAR)
- Program Evaluation and Research Unit (PERU)
- Pharmacogenomics Center of Excellence
- Pharmaceutics Group and Microbicide Clinical Trials Network Central Laboratory Core
- Center for Education and Drug Abuse Research
- Drug Design, Development, and Delivery Center (Drug D3 Center)

Center for Pharmacogenetics (CPG)

Faculty

Christian Fernandez

Song Li

Xiao-chao Ma

Wen Xie

Da Yang

Research Assistant Professor

Jiang Li

Research Associate

Yixian Huang

Postdoctoral Research Associates

Weiwei Guo	Sanjay Rathod
Jibin Guan	Pengfei Xu
Naveen Gundala	Zehua Wang
Jingjing Sun	Junjie Zhu

Graduate Students

Anne Barbosa	Zhuoya Wan
Xinran Cai	Jingyuan Wang
Jing Chen	Yifei Wang
Yuang Chen	Yue Wang
Haozhe Huang	Yang Xie
Sihan Li	Jieni Xu
Amina Shehu	Ziqian Zhang
Hung-Chun Tung	

Visiting Scholars

Betul Er	Jianhua Li
Zihui Fang	Yang Wu-Yue Liu
Ye Feng	Pengfei Ren
Yingjie Guo	Yue Xi
Mikko Karpale	Jiyuan Xing

Significant Research Results

- We have identified two mechanisms of asparaginase-mediated anaphylaxis and developed cell-based tools to determine the contribution of each pathway during the immune-mediated toxicity. (Fernandez Lab)
- Erythropoietic protoporphyria (EPP) is an inherited disease characterized by protoporphyrin IX-mediated phototoxicity and hepatotoxicity, and there is no cure. Our work provides a novel strategy for EPP therapy by targeting ABCG2. (Ma Lab)
- We are using computational tools to identify the genomic markers to predict drug resistance and to infer the potential drug combination for anti-cancer therapy. We performed the first study to link noncoding genotypes with drug response phenotypes in both tumor cell lines and patient tumors and characterized the network of LncRNA-Drug Interactions in 32 cancer types. These data-driven approaches will facilitate the drug discovery and cancer precision medicine in the short future. (Yang Lab)

- AhR was originally identified as a xenobiotic receptor that mediated the toxicity of dioxin and related chemicals. In this study, we have uncovered a novel and cell-type specific role of AhR in liver fibrosis. Our results suggest that development of non-toxic AhR agonists represent a novel strategy to prevent or treat liver fibrosis. (Xie Lab)

Representative Publications

- Wang Y*, Wang Z*, Xu J, Li J, Li S, Zhang M** and **Yang D**#. Systematic identification of non-coding pharmacogenomic landscape in cancer. *Nature Communications* **9**: 3192 (2018). PMID: 30093685.
- Shehu AI, Lu J, Wang P, Zhu J, Wang Y, Yang D, McMahon D, Xie W, Gonzalez FJ, **Ma X**. Pregnane X receptor activation potentiates ritonavir hepatotoxicity. *Journal of Clinical Investigation*. **30**: 130 (2019). PMID: 31039134.
- Yan J#, Tung HC#, Li S, Niu Y, Garbacz WG, Lu P, Bi Y, Li Y, He J, Xu M, Ren S, Monga SP, Schwabe RF, Yang D, **Xie W**. Aryl hydrocarbon receptor signaling prevents activation of hepatic stellate cells and liver fibrogenesis in mice. *Gastroenterology* **157**: 793-806 (2019). PMID: 31170413 (#, co-first authors)
- Xie Y, Xu M, Deng M, Li Z, Wang P, Ren S, Guo Y, Ma X, Fan J, Billiar TR, **Xie W**. Activation of pregnane X receptor sensitizes mice to hemorrhagic shock induced liver injury. *Hepatology* **70**: 995-1010 (2019). PMID: 31038762
- Xu J, Sun J, Ho PY, Luo Z, Ma W, Zhao W, Rathod SB, Fernandez CA, Venkataramanan R, Xie W, Yu AM, **Li S**. Creatine based polymer for codelivery of bioengineered MicroRNA and chemodrugs against breast cancer lung metastasis. *Biomaterials*. **210**: 25-40 (2019) PMID: 31054369

Significant Invited Presentations

- **Wen Xie** was an invited speaker at 22nd Microsomes and Drug Oxidations (MDO) Meeting (Speaker and Session Chair). Kanazawa, Japan. October 1-5, 2018.
- **Christian Fernandez** was an invited speaker at University of Iowa College of Pharmacy, Department of Pharmaceutical Sciences and Experimental Therapeutics Seminar Series. Iowa City, IA. October 23, 2019.
- **Da Yang** was an invited speaker at Department of Pathology, University of Pennsylvania, Philadelphia, PA. April 26, 2019
- **Song Li** was an invited speaker at the 5th Great Lakes Breast Cancer Symposium, Columbus, OH. May 2, 2019.
- **Xiaochao Ma** was an invited speaker at the 2019 ASPET Annual Meeting at Experimental Biology at Orlando, FL, 2019. April 6, 2019.

Significant Grants

- 08/01/19 – 05/31/27: “Xenobiotic Receptors in Mediating the Environmental Effects on Human Disease and Morbidity”, (R35ES030429), NIH (Xie, P.I., 55% effort). Total cost \$6,854,034.
- 01/01/19 - 12/31/22 “The regulation of cell cycle by long non-coding RNA in breast cancer”, American Cancer Society/RSG-18-179-01 (Yang, P.I., 10% effort).
- 04/08/19-03/31/24 “CD4 T Cell-Targeted Nanoparticle in vivo delivery of CRISPR/Cas9 Genome Editors for HIV Cure”, RO1AI145034 (Wenhui Hu, P.I., Song Li, Co-Investigator, 5% effort). DC for Dr. Li: \$100,000/year.

Innovations

- **Da Yang.** Targeting Highly Tumor-Specific Long-Coding RNAs for Cancer Diagnosis, Prognosis and Therapy, **United States Patent Application No. 62/633,828, 2018**
- **Ma X, Zhu J, Lu J.** A novel therapy for Erythropoietic Protoporphyrin (EPP) and X-Linked Protoporphyrin (XLP) (**Patent, 2019, Application # 62/850,061**).

Center for Clinical Pharmaceutical Sciences

Faculty

Samuel M. Poloyac
Kerry M. Empey
Philip E. Empey
Thomas D. Nolin
Lisa C. Rohan
James M. Stevenson

Graduate Students

Jonathan Birabaharan	Madeline Kreider, PharmD
Morgan Casal	Madeline Lipp, PharmD
Karryn Crisamore	Lingjue Li, MS *2019
Prithvirajan Durairajan	Harisudhan Thanukrishnan
Josh Deppas	Alexander J. Prokopienko
Katherine Eichinger	Chenxiao Tang
Yoko Franchetti	Xin (Oliver) Tong
Fanuel Hagos	Hongfei Zhang
Keito Hoshitsuki	Ruohui Zheng
Kunal Jhunjunwala	

Significant Research Results

- **Empey, KM;** Discovery of a novel cell phenotype that heavily influences responses to vaccines: We have recently discovered a novel cell phenotype that appears to regulate the development of RSV vaccine enhanced disease. With further studies, we expect that this discovery may provide a new therapeutic target and will further influence vaccine development strategies for RSV disease as well as other pulmonary infections.
- **Empey, KM;** Research and development of a maternal RSV vaccine: respiratory syncytial virus (RSV) is a global disease that infects people of all ages throughout their lifetime. Our most recent collaboration has led to the research and development of a maternal RSV vaccine that we are currently testing in pre-clinical mouse studies. Successful development of this vaccine has the potential to prevent morbidity and mortality associated with RSV disease on a global scale.
- **Rohan, LC;** Awarded from the Chancellors Early Stage Commercialization Fund, University of Pittsburgh. First Prize: “Pitt Ventures First Gear Program”

Representative Publications

- Hagos FT, Adams SM, Poloyac SM, Kochanek PM, Horvat CM, Clark RSB, **Empey PE**. Membrane transporters in traumatic brain injury: Pathological, pharmacotherapeutic, and developmental implications. *Exp Neurol*. 2019 Feb 21. PMID: 30797827. 4.48
- Stubbs JR, Stedman MR, Liu S, Long J, Franchetti Y, West RE, Prokopienko AJ, Mahnken JD, Chertow GM, **Nolin TD**. Trimethylamine N-oxide and cardiovascular outcomes in patients with end-stage kidney disease receiving maintenance hemodialysis. *Clin J Am Soc Nephrol* 2019;14(2)261-267. PMID: 30665924.
- **Poloyac SM**, Bertz RJ, McDermott L, Marathe P. Pharmacological Optimization for Successful Traumatic Brain Injury Drug Development. *J Neurotrauma*. 2019 April 10. [epub ahead of print]. 5.0

Significant Invited Presentations

- National Institute of Allergy and Infectious Diseases, “*National Institutes of Health DS-Cav1/Advax™ for maternal RSV vaccination.*” Rockville, MD, November 2018. **Empey, KE**.
- Metabolomic Studies in the Critically Ill: The Good, the Bad, and Ugly. Society for Critical Care Medicine in San Diego, CA. January 2019. **Empey PE**.
- 2018 Contraceptive Development Meeting “*Polymeric Films for Drug Delivery*” St. Paul, MN, September 2018. **Rohan, LC**.

Significant Grants

- R43AI140941 – Phase I (PI: Empey, K/Yondola – Calder Biosciences)
National Institute of Allergy and Infectious Diseases, National Institutes of Health
Period of Support: 12/2018-12/2020
An adjuvant for an RSV prefusion F vaccine that safely protects infants via maternal vaccination
- PI: Empey, P; Co-I Stevenson, JM
RK Melon Foundation
Period of Support: 01/2019-12/2021
Accelerating Whole Genome Sequencing Adoption Through Innovative Education
- R21/R33 NS107785 (MPI: Poloyac and McDermott)
NINDS: Innovation Grants to Nurture Initial Translational Efforts (IGNITE)
Period of Support: 07/2018 – 07/2021
20-HETE Formation Inhibitors in Cardiac Arrest
- 1R61AI142687-01 (PI: Rohan)
NIH/NIAID/CRMP
Period of Support: 12/2018-12/2020
Long Acting Film Technology for Contraception and HIV Prevention (LATCH)

Innovations

- McDermott, LA; Poloyac SM; Koes, D. “20-HETE formation inhibitors” Provisional Patent Application. Appl No. 62/803,398
- **Empey K**, Petrovsky N, Marshall C. Compositions and methods for vaccination against respiratory syncytial virus infection. University of Pittsburgh of the Commonwealth System of higher Education et al. WIPO, 10504-024W01, March 2019.

COMMUNITY LEADERSHIP AND INNOVATION IN PHARMACY (CLIP) CENTER

Faculty

Lucas Berenbrok	Inmaculada Hernandez
Kim C. Coley	Lauren Jonkman
Sharon Connor	Melissa S. McGivney
Scott Drab	Karen Pater
Philip Empey	Janice Pringle
Lorin Grieve	Christine Ruby-Scelsi
Deanne Hall	

Staff

Brandon Antinopoulos	Stephanie McGrath
Joni Carroll	Ravi Patel
Renee Fry	

Fellow

Katie Doong

Residents

Amber Lapping	Michelle Howerton
Sneha Mitra	Hannah Welch
Catherine Phi	Karin Yamazaki
Mahalia Harrell	

Patient Care:

In FY19, School of Pharmacy faculty members:

- Served approximately **3,500 patients** at local health centers, clinics, shelters and drop-in-centers, dispensed over **6,000 prescriptions, at no cost** to the patient, valued at over \$500,000. **[Jonkman, Connor, Pater, Carroll]**
- Engaged over **250 student pharmacists and pharmacy residents** yearly in the provision of patient care and oversaw **over 3,000 volunteer hours** provided by pharmacists and student pharmacists. **[Jonkman, Connor, Pater, Carroll]**
- Participated in the provision of **over 1,800 influenza vaccinations** with the Allegheny County Health Department, Giant Eagle Pharmacy, Rite Aid Pharmacy and Asti's South Hills Pharmacy. **[Carroll, Doong, Lapping, Phi, Mitra]**
- Coordinated and provided **over 4,500 influenza vaccinations** to Pitt and UPMC faculty, staff and students. **[Hall, Berenbrok, Harrell, Yamazski]**
- Engaged over **80 community pharmacy locations** with 114 student pharmacists **providing care to over 6,000 people**. **[McGivney, Antinopoulos]**
- Supported the Pennsylvania Pharmacist Care Network with over **150 pharmacies statewide** who have **provided care to over 4,000 people** with Medicaid since 2017. **[McGrath, McGivney, Coley, Carroll, Antinopoulos]**
- Provided **over 800 documented interventions for over 250 senior citizens at 14 senior center** locations through the Silver Scripts Program. **[Berenbrok, Coley, Lapping, Phi, Doong, Mitra]**

- Enrolled **nearly 1000 people into the NIH All of Us research registry** through our partnership with Giant Eagle pharmacy and CTSI. [Antinopoulos, Lapping]

Representative Publications:

- Berenbrok LA, Hart KM*, McGrath SH, Coley KC, McGivney MS, Empey PE. Community pharmacists' educational needs for implementing clinical pharmacogenomic services. *J Am Pharm Assoc* (2019), doi: <https://doi.org/10.1016/j.japh.2019.03.005>.
- Carroll J^, McGivney MS, Grapsy J#, Renner H^, McCormick K, Cooney SS, Coley KC. Development of a Prescription Dispensing Data Infographic to facilitate collaboration between community pharmacists and prescribers. *J Am Pharm Assoc* 2019;59:232-237.
- Dombrowski SK*, Bacci JL, Klatt PM, Osborne MA, Castelli G, Burns A, McGivney MS. Financial models utilized throughout the United States by non-academic, outpatient primary care practices to justify incorporation of pharmacists in team-based primary care. *J Am Pharm Assoc* 2019. (2019), doi: <https://doi.org/10.1016/j.japh.2019.02.005>.
- Fisher AM, Mtonga TM, Espino JU, Jonkman JL, Connor SE, Cappella NK, Douglas GP. User-centered design and usability testing of RxMAGIC: a prescription management and general inventory control system for free clinic dispensaries. *BMC Health Serv Res* 2018;18(1):703.

Significant Invited Presentations:

- McGivney MS. "Community Engagement: The Pitt Experience". Invited speaker. Atlantic Coast Conference (ACC) Academic Leaders Consortium. Georgia Tech University. Atlanta, GA. February 8, 2019
- Jonkman L. Interprofessional practice to improve the quality of patient care. Pharmacy SNOW Symposium. Breckenridge CO, January 2019.

Significant Grants:

- Community Pharmacy Practice Transformation Initiative: Facilitating partnerships between Community Pharmacy Enhanced Service Networks (CPESN) and schools of pharmacy. Community Pharmacy Foundation.
McGivney, Coley, Carroll \$65,000 2019-2020
- A Statewide Community Pharmacy Research Network Aligning Patients, Providers, and Researchers. PCORI
K. Coley, Carroll, McGivney \$249,937 2018-2020
- CDC: Improving the Health of Americans Through Prevention and Management of Diabetes and Heart Disease and Stroke. CDC/PA Department of Health. Subcontractor of PPA, serving as Principal Investigator for the Development of the Pennsylvania Pharmacists Care Network (PPCN) **McGivney, Carroll, Coley** \$34,480 2018-2019

Significant Innovations

- Established the ACT (Academia-CPESN Transformation) Pharmacy Collaborative: the **first nationwide collaborative of schools/college of pharmacy** to partner together to foster community pharmacy practice transformation. To date, **58 schools of pharmacy nationwide** have joined. [**McGivney, McGrath, Coley, Carroll**]
- Launched the third Medicaid contract for the Pennsylvania Pharmacists Association's Pennsylvania Pharmacists Care Network (PPCN) serving over 2,000 people in over 100 local pharmacies. Nine students served as the Quality Engagement Team for PPCN contacting pharmacists bi-weekly to support provision of patient care: [**McGrath, Antinopoulos, Coley, Carroll, Doong, McGivney**]

- Established a partnership with the Allegheny County Health Department to provide pharmacy services to the County: **Carroll, Doong, McGivney**

National Center of Excellence for Computational Drug Research (CDAR)

Faculty

Xiang-Qun (Sean) Xie
 Richard Bertz
 Junmei Wang
 Terence McGuire
 Lirong Wang
 Zhiwei Feng
 Jaden Jun

Graduate Students

Shifan Ma	Nan Wu
Changrui Xing	Shuhan Liu
Yuemin Bian	Yuanyuan Xu
Yankang Jing	Siyi Wang
Ziheng Hu	Mingzhe Shen
Beihong Ji	Xiguang Qi
Peihao Fan	Yubin Ge
Weiwei Lin	

Visiting Scholars & Postdoctoral Fellows

Yuanqian Wang	Ying Xue
Jin Cheng	
Jing Tian	
Yan Chen	

Research Scientists

Xibing He
 Viet Man

Undergraduate Students

Tianqi Wang
 Jack Zhao

Significant Research Results

- **Pharmacometrics & Systems Pharmacology (XQ Xie, JM Wang, LR Wang, ZW Feng, R Bertz)**
 - We have constructed robust models for predicting substance use disorder and substance use severity (a newly established substance use/drug abuse outcome).
 - We made progress to elucidate the drug-drug interaction mechanisms for oxycodone co-administrated with diazepam.
 - We made progress to study the PK profile of heroine by using population PK modeling.
- **Computer-Aided Drug Design (XQ Xie, JM Wang, LR Wang, ZW Feng)**
 - We have developed a novel approach, ELIE, to accurately calculate binding affinity.

- We have evaluated 17 protein force fields on studying the aggregation mechanisms for Amyloid-beta
- We have developed a novel computational protocol for designing inhibitors of Amyloid-beta aggregation. We have also studied the Amyloid-beta aggregation mechanism through massive molecular dynamics simulations
- We have studied a set of protein systems, including MscL, NK1R, TLR2, EGFR, etc., through collaborations.
- **Novel Platforms or Tools for Virtual Animal and Drug Abuse (XQ Xie, ZW Feng et al)**
 - We have finished the platform of virtual animal (MS is in prepar), which provide the experimental data/analyses of drugs for CVD. In addition, the platform can provide the prediction for the query compound(s)
 - We have finished the platform of Drug Abuse Knowledgebase-GPCRs (MS in revision) that integrated with artificial intelligence algorithms

Representative Publications

- Hu Z, **Wang LR**, Ma S, Kirisci L, **Feng ZW**, Xue Y, Klunk WE, Kamboh MI, Sweet RA, Becker J, Lv Q-z, Lopez OL*, **Xie X-Q***. Synergism of antihypertensives and cholinesterase inhibitors in Alzheimer's disease. *Alzheimer's & Dementia: Translational Research & Clinical Interventions*, 2018 Oct; 4:542-555. PMID: 30386819. PMCID: [PMC6205113](#).
- Wu X, Xie S, **Wang LR**, Fan P, Ge S, **Xie X-Q**, Wu W*. A computational strategy for finding novel targets and therapeutic compounds for opioid dependence. *PLoS One*. 2018 Nov 7;13(11): e0207027. eCollection 2018. PMID: 30403753. PMCID: PMC6221321.
- Yin, J.; Chapman, K.; Clark, L.; Shao, Z.; Borek, D.; Xu, Q.; **Wang, JM.**; Rosenbaum, D. Crystal structure of the human NK1 tachykinin receptor. *PNAS USA*. 2018 Dec; 115 (52):13264-13269. PMID: 30538204. PMCID: [PMC6310836](#)
- Bian Y, Jing Y, **Wang LR**, Ma S, **Jun JJ**, **Xie XQ*** Prediction of orthosteric and allosteric regulations on cannabinoid receptors using supervised machine learning classifiers. *Mol Pharm*. 2019 Jun; 16(6):2605-2615. PMID: 31013097. PMCID: [PMC6732211](#)

Significant Invited Presentations

- **Xie, XQ**, 2018 Nov 1-3 “GPCRs-KB. An Integrated Platform of GPCRs Computational Chemogenomics KnowledgeBase for System Pharmacology Drug Discovery” in 2018 International Conference of Frontiers in Precision & Translational Medicine (PTMC2018)”, Peking University Health Science Center, Beijing, China.
- **Xie, XQ**, 2018 Nov 12 “GPCRs-Drug Abuse. An Integrated Platform of GPCRs Computational Chemogenomics KnowledgeBase for System Pharmacology Drug Discovery” SYSU, Guangzhou, China
- Yuemin Bian and **Xiang-Qun Xie** “Chemogenomics-knowledge based systems pharmacology analysis and integrated in silico simulation on cannabidiol (CBD)” Chemistry & Pharmacology of Drug Abuse, Boston, United States, 2018.

Significant Grants

- **P30 DA035778 (Director: Xie)** 09/01/2014-08/31/2019 (1 Year No Cost Extension)
09/01/2020-08/31/2025 (Renewal Pending)
NIDA Center of Excellence of Computational Drug Abuse Research (CDAR)
National Institutes of Health

The overall goal of the Computational Drug Abuse Research (CDAR) Center is to advance state-of-the-art computational technologies for research toward the prevention and treatment of drug abuse (DA) and DA-related diseases.

- **3R01MH113857 - 02W1** (Price, Rebecca) 12/01/18-06/30/22 0.7 calendar
NIH/NIMH \$46,648

Improving Precision of Ketamine Metabolite Assays

Role: Pharmacokinetics Expert (Junmei Wang)

This project seeks to identify the neural and cognitive changes that accompany rapid relief from depressive symptoms following intravenous ketamine.

- **NIH 1R01MH116046-01A1** (PIs: Sweet, Kofler and **Wang L**) 09/25/2018-06/30/2023
Synaptic Resilience to Psychosis in Alzheimer Disease

Innovations

- **PSP course:** The CCGS center team faculties successfully developed a new Graduate Program “Pharmacometrics and system Pharmacology (PSP) course program. The PSP graduate program is the first in the nation. The PSP Program focuses on applying pharmacometrics and computational systems pharmacology techniques to advance “Big Data” computing preclinical and clinical research. PSP will facilitate the development of novel drug candidates that are less likely fail during clinical trials and will help to provide better understanding of drug mechanisms of action and therapeutic effects at systems pharmacology levels. Individuals will:
 - Acquire knowledge and gain hands-on experience of applying PSP to advance drug discovery
 - Develop strong computational modeling and simulation expertise for conducting PSP research
 - Receive systematic training to become a pharmaceutical professional working in either academia or pharmaceutical industry
- Novel small-molecules antagonize PRMT5-mediated KLF4 methylation for target therapy (*pending*)
- hTRPV1 CHEMICAL AGENTS (UPITT Ref. No. 03491 | F&L Ref.: 076333-0897 | US Application No.: 15/546833)

Program Evaluation Research Unit (PERU)

Faculty

Janice L. Pringle

Patient Care:

Measurement	Patients Impacted
Number of Healthcare Professionals Trained	1,023
Number of Students Trained	936
Number of Screenings	25,966
Number of Brief Interventions	1,941
Number of Referrals to Treatment	6,500
Number of Patients Engaged in Treatment	15,031

Representative Publications:

- Cole, E. S., DiDomenico, E., Cochran, G., Gordon, A. J., Gellad, W. F., **Pringle, J.**, Warwick, J. & Kelley, D. (2019). The Role of Primary Care in Improving Access to Medication-Assisted Treatment for Rural Medicaid Enrollees with Opioid Use Disorder. *Journal of General Internal Medicine*, 34(6), 936-943.
 - *Significance: Patients with opioid use disorder utilize primary care providers at a high rate. This means primary care is a potential intervention point to treat OUD, particularly if the enrollee's PCP is located nearer than their MAT prescriber.*
- **Pringle, J. L.**, Cochran, J., Aruru, M. (2019). Role of Pharmacists in the Opioid Use Disorder (OUD) crisis. *Research in Social & Administrative Pharmacy*, 15(2), 228-229.
- Cochran, G., Cole, E. S., Warwick, J., Donohue, J. M., Gordon, A. J., Gellad, W. F., & **Pringle, J.** (2019). Rural access to MAT in Pennsylvania (RAMP): a hybrid implementation study protocol for medication assisted treatment adoption among rural primary care providers. *Addiction science & clinical practice*, 14(1), 25.
 - *Significance: The Systems Transformation Framework, developed by Dr. Janice Pringle, can be used to implement evidence-based OUD treatment in rural primary care practices.*

Significant Invited Presentations:

- U.S. Department of Veterans Affairs and SAMHSA, Governor's Challenge to Prevent Suicide Among Service Members, Veterans, and their Families, Implementation Academy. Washington, D.C. May 2019.
- National Association of Chain Drug Stores Annual Meeting, Dean's Forum (Keynote). West Palm Beach, FL. April 2019.
- MTM Conference. "Role of Community Pharmacy in Improving Public Health." Philadelphia, PA. October 12, 2018.
- Workshop, "Overcoming Barriers to Implementing Medication Assisted Treatment in Family Medicine Practices," Family Medicine Education Consortium. Rye Brook, NY. December 2018.

Significant Grants:

- Commonwealth Opioid Medical Medication-Assisted Treatment Integration and Training Program
 - The COMMIT Program is implementing an innovative medication assisted treatment (MAT) hub and spoke model within Washington County, a large rural county in southwest Pennsylvania. PERU will serve as the “Uber Hub” and will lead COMMIT’s implementation, evaluation and sustainability. Project Period: September 2018-2021 Sponsor: Substance Abuse and Mental Health Services Administration Award: \$1,550,000 (3 year).
- Strategies to Coordinate Overdose Prevention through Emergency Medical Services (SCOPE) in Westmoreland and Surrounding Counties
 - PERU will provide technical assistance to participating county agencies through education workshops for EMS personnel, assistance in collecting and analyzing data, implementing sustainable protocols, assisting in the development of tailored implementation plans, and providing ongoing technical assistance. Project Period: September 30, 2018 – September 29, 2022 Award: \$859,971 Sponsor: Substance Abuse and Mental Health Services Administration (SAMHSA)/Subaward through the Westmoreland Drug & Alcohol Commission.
- Centers of Excellence Technical Assistance and Learning Network Development
 - In order to support the Centers of Excellence in their efforts to integrate physical and behavioral healthcare, expand access to medication-assisted treatment, and engage individuals along the continuum of care through the use of community-based care management teams, the University shall provide direct one-to-one technical assistance to each Center of Excellence, using methodologies that identify and address the individualized needs of each Center. Project Period: March 8, 2019 – March 7, 2020 Award: \$755,000 Sponsor: The Pennsylvania Department of Human Services.

Pharmacogenomics Center of Excellence

Faculty

Philip E. Empey
James C. Coons
James M. Stevenson
Lucas A. Berenbrok

Graduate Student

Karryn Crisamore

Fellow

Ryley Uber

Staff

Linda Prebehalla, RN

Major Accomplishments

Faculty have made a difference in patient care this past year through the following accomplishments:

- Led *PreCISE-Rx*, the most significant precision medicine implementation project at Pitt/UPMC; to-date, our service has provided standard of care genotyping and clinical consultations to nearly 3000 patients. **Empey PE. Coons JC. Stevenson JM. Uber R. Criasmore K. Prebehalla L.**
- Launched our new Pitt-Thermo-Fisher Scientific PGx Center of Excellence, the first academic-industry partnership focused on pharmacogenomics nationally. With the Clinical and Translational Science Institute (CTSI) recruited over 2000 patients into a new DNA Biobank (Pitt+Me Discovery) and installed new testing equipment capable of testing >1200 genes in biobank participants to support Center research and broad clinical implementation. **Empey PE. Coons JC. Stevenson JM. Uber R. Criasmore K.**
- Invited member of the national Omics Workgroup for the All of Us® research program and NIH Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC) **Empey PE**

Significant Publications

- Hicks JK, Aquilante CL, Dunnenberger HM, Gammal RS, Funk RS, Aitken SL, Bright DR, **Coons JC**, Dotson KM, Elder CT, Groff LT, Lee JC on behalf of the 2019 ACCP Clinical Practice Affairs Committee. Precision pharmacotherapy: integrating pharmacogenomics into clinical pharmacy practice. *J Am Coll Clin Pharm* 2019;2(3):303-13.
 - *This paper articulates real-world clinical applications of precision pharmacotherapy, with a focus on clinical pharmacogenomics.*
- Cavallari LH, Van Driest SL, Prows CA, Bishop JR, Limdi NA, Pratt VM, Ramsey LB, Smith DM, Tuteja S, Duong BQ, Hicks JK, Lee JC, Owusu Obeng A, Beitelshes AL, Bell GC, Blake K, Crona DJ, Dressler L, Gregg RA, Hines LJ, Scott SA, Shelton RC, Weitzel KW, Johnson JA, Peterson JF, **Empey PE**, Skaar TC. Multi-site investigation of strategies for the clinical implementation of CYP2D6 genotyping to guide drug prescribing. *Genet Med* 2019 Mar 21.
 - *Comprehensive review to approaches to implement pharmacogenomic testing by leading adopters nationally.*
- **Crisamore KC**, Nolin TD, **Coons JC**, **Empey PE**. Engaging and Empowering Stakeholders to Advance Pharmacogenomics. *Clin Pharmacol Ther.* 2019.
 - *Invited review of approaches to advance precision medicine through stakeholder engagement.*

Invited Significant National/International Presentations

- Returning Results Directly to Patients: Risks and Benefits. Clinical Pharmacogenetics Implementation Consortium (CPIC) in Memphis, TN. June 2019. **Empey PE**
- Pharmacogenomics – Precision Prescribing to Achieve Precision Medicine. Precision Medicine Leadership Summit (PMLS) in Philadelphia, PA. June 2019. **Empey PE**
- “Independent or Integrated? Debating the Optimal Approach to Pharmacogenomics Education in the Pharm. D. Curriculum” American Association of Colleges of Pharmacy Annual Meeting. Chicago, IL July 2019. **Stevenson JM**

Grants

- R. K. Mellon Foundation. Accelerating Whole Genome Sequencing Adoption Through Innovative Education. 2019-2021. **Empey PE (PI). Stevenson JM (Co-I)**
- Lowenstein Foundation. Application of Machine Learning to Medication Outcome Prediction. 2019. **Empey PE (PI).**

- Veteran Health Administration. Predicted and observed 10-year incidence of cardiovascular events in veterans treated with antipsychotics. 2019. **Stevenson JM** (PI)

Innovations

- Trained over 1500+ learners to apply pharmacogenomics in their practices using our innovative Test2Learn program in a cumulative 36 programs and multiple other universities nationally. **Empey PE. Coons JC. Stevenson JM. Adams SM. Berenbrok L.**
- Developed a novel precision medicine clinic that offers pharmacogenomic services through a unique partnership with Family Medicine. **Berenbrok L. Empey PE**

Pharmaceutics Group and Microbicide Clinical Trials Network Central Laboratory Core

Faculty

Lisa Rohan
 Sravan Patel
 Vinayak Sant

Research Staff

Lin Wang
 Christina Bagia
 Lindsay Ferguson Kramzer
 Phillip Graebing
 Junmei Zhang

Postdoctoral Fellows

Doaa Alantary
 Hima Ruttala
 Guru Raghavendra Valicherla

Visiting Scholar

Jia Dan

Graduate Students (PhD)

Prithvirajan Durairajan
 Sheila Grab
 Kunal Jhunjunwala
 Jing Li
 Ruohui Zheng
 Xin Tong

Graduate Students (MS)

Rongkun Xu
 Stuti Desai
 Tanvi Shah
 Yun-Shan Chiang

High School

Sabina Spektor
 Lan Anh

PharmD Students

Joshua Cinicola Yihan Li
 Hailey Mook Leia Stephenson
 Polina Langer Lauren Xu
 Alexandra Maresh

Undergraduate Students

Nathan Lampfield (University of Pittsburgh)
 Elain Xu (Carnegie Melon University)
 Amanda Micklo (The Ohio State University)
 Nicholas Youwakim (University of Pittsburgh)

Ronald Max Puntil (University of Pittsburgh)
 Haosheng Li (Sun Yat-Sen University)
 Zitong Shao (Sun Yat-Sen University)

Significant Research Results

- Through the Film Antiretroviral Microbicide Evaluation (FAME) Program Preclinical/Clinical Program for HIV Topical Microbicides (IPCP) (U19) grant from NIAID led by Drs. Lisa Rohan and Sharon Hillier, an extended release vaginal film drug delivery platform was developed. The first clinical trial evaluating this platform was completed and demonstrated its safety and acceptability in women. The film platform has been further developed for delivery of an integrase inhibitor developed by Merck & Co. for prevention of HIV infection. This HIV prevention product will be evaluated in clinical trials this year.
- The group continues to excel in innovation in design and translation of pharmaceutical products. Dr. Rohan received a “Pitt Innovator Award” at the 13th Annual Celebration of Innovation at the University of Pittsburgh. The group also received the opportunity to participate in the University of Pittsburgh’s Pitt Ventures First Gear Program. Through this program they were awarded \$3,000 funding under the NSF I-Corps Site Program, University of Pittsburgh, Innovation Institute. The awarded funding was to advance a vaginal film product designed in the lab for the prevention of Herpes Simplex Virus Infection. Through this program the team received First Prize in the final competition and were awarded an additional \$20,000 from the Chancellors Early Stage Commercialization Fund, University of Pittsburgh.
- The Pharmaceuticals Group has developed a rectal product intended to prevent HIV as part of the PREVENT grant (Griffithsin-based Rectal Microbicides for PREvention of Viral ENTRY) funded by NIAID at the NIH. This multiproject program focuses on a rectal specific protein (griffithsin-based) microbicide product for people engaging in rectal receptive intercourse to prevent HIV acquisition. A first-in-human study was recently initiated within the program for an enema product developed by the Pharmaceuticals Group.

Representative Publications

- Gong T, Patel SK, Parniak MA, Ballou B, Rohan LC (2019). Nanocrystal Formulation Improves Vaginal Delivery of CSIC for HIV Prevention. *AAPS Pharm Sci Tech*. 2019 Aug 13;20(7):286. doi: 10.1208/s12249-019-1503-z. PMID: 31410664.
- McKinley DJ, Patel SK, Regev G, Rohan LC, Akil A (2019). Assessment of Relationships between Process Parameters and Vaginal Film Performance Using Artificial Neural Networks and Implementation of an Evolutionary Algorithm for Use in Formulation Optimization. *International Journal of Pharmaceutics*. 2019 Jun 26;20:239 (epub). doi: 10.1208/s12249-019-1442-8.
- Yang H, Li J, Patel SK, Palmer KE, Devlin B, Rohan LC. Design of Poly(lactic-*co*-glycolic Acid) (PLGA) nanoparticles for vaginal co-delivery of Griffithsin and Dapivirine and their synergistic effect for HIV prophylaxis. *Pharmaceutics*. 2019 Apr 16;(11)4:184. Pii: E184. doi: 10.3390/pharmaceutics11040184. PMID: 30995761.

Significant Invited Presentations

- **Dr. Sravan Patel** participated in an ANDA meeting at USFDA to support Profounda Inc. in dissolution studies towards their generic drug product approval.
- **Dr. Rohan** was invited to speak by the Eunice Kennedy Shriver National Institute of Child Health and Human Development at the 2018 Contraceptive Development Meeting held at the University of Minnesota on September 24th and 25th where she presented a talk entitled: “Polymeric Films for Drug Delivery”

- At HIVRAP, 20018 in Madrid, Spain, **Dr. Rohan** presented the poster entitled: “Development of an Extended Release MK-2048 Vaginal Film” and Dr. **Sravan Patel** presented the poster entitled: “Vaginal Film Administration and Placement Study in Women (FLAG Trial).”

Significant Grants

- The Pharmaceutics Group was awarded a \$1,350,893 R61 grant (R61AI142687) from NIAID at NIH entitle “Long Acting Film Technology for Contraception and HIV Prevention (LATCH)”. This grant will develop a product which combines contraceptives with antiviral drugs for prevention of HIV.
- The Pharmaceutics group was awarded a \$547,484 contract (HHSN27220160000) entitled ”Studies to Assess Interactions between dapivirine and vaginally applied over-the-counter products” through the CRMP program at NIAID to evaluate drug-drug interactions between a new anti-HIV drug dapivirine which has been developed in a vaginal ring format. This product is currently undergoing regulatory evaluation by the EMA for licensure. IPM plans on pursuing regulatory filing with FDA and MRC this year. If successful, this product would be the first topical option for women who wish to prevent themselves from acquiring HIV. The contract develops critical data required by the regulatory bodies.
- Drs. **Lisa Rohan**, Sharon Achilles (Magee-Womens Hospital), and Robert Bies (University of Buffalo) received a \$276,824 award (HHSF223201810188) entitled “Physiologically-Based Model of the Female Reproductive Tract: Vaginal and Intrauterine Delivery Components” from the FDA. This award will develop a PBPK model for application in development of new intrauterine device products or generics.

Center for Education and Drug Abuse Research

Faculty

Levent Kirisci
 Maureen D. Reynolds
 Ralph E. Tarter
 Michael Vanyukov

Graduate Students

Casey Butrus	Christopher LaFratte
Kiana Green	Lina Shao
Gwang-Yee Jessica Hu	Carson Shoemaker
Jared Ickes	Erin Wasylon

Postdoctoral Fellows

Kristine Marceau
 Jill Rabinowitz
 Prevesh Sharma

Significant Research Results

- Using machine learning methodology, psychological, health and social characteristics were identified that predict the developmental trajectory to addiction from ages 10-30.

- Item response theory methodology was employed to derive the *opioid use disorder severity scale (OUDSS)* that could extend to the subdiagnostic segment of the opioid-using population, using the DSM-IV symptoms of both abuse and dependence. The resulting score could thus inform urgency for prevention as well as treatment placement. In view of manifold deleterious consequences of hazardous opioid use, including fatal overdose, trauma, infection, criminal justice involvement, and serious psychiatric illness, it was determined whether the OUDSS score predicts health, psychological, and social adjustment problems two years later, and detects individuals who subsequently manifest problems concomitant to substance abuse that require intervention in these latter areas.
- Adolescent temperament differs on family processes and internalizing and externalizing symptoms in adulthood

Representative Publications

- Benedict NJ, Wong A, Cassidy E, Lohr BR, Pizon AF, Smithburger PL, Falcione BA, **Kirisci L**, Kane-Gill SL. (2018). Predictors of resistant alcohol withdrawal (RAW): A retrospective case-control study. *Drug and Alcohol Dependence*, 192: 303-308.
- Maher, BS, Latendresse, S, **Vanyukov, MM** (2018). Informing prevention and intervention policy using genetic studies of resistance. *Prevention Science*, 19: 49-57. DOI:10.1007/s11121-016-0730-8.
- Rabinowitz, JA, Packard, J, Drabick, DAG, **Reynolds, MD** (2019). Do profiles of adolescent temperament differ on family processes and internalizing and externalizing symptoms in adulthood? *Journal of Child and Family Studies*, 28: 457. <https://doi.org/10.1007/s10826-018-1276-0>

Significant Invited Presentations

- **Kirisci, L**. Measuring well-being: Statistical Machine Learning Approach. Paper presented at the annual meeting of International College of Person-centered Medicine, Geneva, Switzerland, April 8-11, 2019. (Podium Presentation as invited speaker).
- Garofalo, C, Weller, JA, **Reynolds, M**. Boldness, meanness and disinhibition traits in adolescence: Structure and longitudinal trajectories into young adulthood. Podium presentation at the 13th annual international conference on Child and Adolescent Psychology, Kuching, Malaysia Aug 6-8, 2018.
- Weller, JA, Garofalo, C, **Reynolds M**. Does child maltreatment account for heterogeneity in the development of psychopathic traits? Podium presentation at the 13th annual international conference on Child and Adolescent Psychology, Kuching, Malaysia Aug 6-8, 2018.

Significant Grants

- Mechanisms of Change for an Effective Alcohol Text Message Intervention
Co-I: **Levent Kirisci**
Funding source: NIAAA
- Impact of Pharmacist-led Motivational Interviewing Program on Initiation and Completion of Hepatitis B Vaccination Series in Patients with Diabetes Mellitus”
Co-I: **Levent Kirisci**
Funding source: National Association of Chain Drug Stores
- Pittsburgh SBIRT: Training Health Professions Students to Conduct SBIRT
PI: **Maureen Reynolds**
Funding Source: CSAT/SAMHSA

Drug Design, Development and Delivery Center (Drug D3 Center)

The mission of the Drug D3 Center is to accelerate design, development, and delivery of drugs by bringing together multidisciplinary teams with pharmaceutical scientists and clinical researchers to create synergy and enhance early decision-making in order to accelerate the development process. Center scientists work on chemical and biological entities at phases through design to licensed and marketed drugs.

Research Capabilities

Expertise in collaborative research may include, but is not limited to:

- Validation of targets for drug design
- Small or large molecule hits for lead compound drug development
- Optimization of target product profile for drug development
- Lead compound assessment of pharmacokinetics and target engagement
- Computational modeling for drug target interactions and pharmacokinetic/dynamic assessment

Ongoing Projects

- Drug D3 Center includes mass spectrometric analytical expertise through the Small Molecule Biomarker Core Facility. This core laboratory collaborates with over 40 principal investigators, which has led to the support for 15 funded NIH grants, and 17 coauthored publications across the schools of the health sciences and engineering. Overall operational budget is over \$250,000 per year for this unsubsidized core laboratory.
- **Project Title:** Hank Karp Project; A strategy for the discovery of novel retinoid pathway-responsive small molecules exhibiting targeted therapeutic potential in IDH mutant gliomas
Investigators: Nduka Amakalor, Paul Johnston, Lee McDermott.
Status: Validated high through-put reporting system and initiating screening for drug discovery.
- **Project Title:** Targeting hexokinase isoform 4 (HKI-4) in adult brain cancer
Investigators: Sameer Agnihotri, Bruce Pollack, David Koes, and Lee McDermott
Status: Chemical synthesis of novel small molecule inhibitors currently being developed for lead design and optimization.
- **Project Title:** 20-HETE Formation Inhibitors in Cardiac Arrest (NIH R21/R33 funded)
Investigators: Lee McDermott, Sam Poloyac, David Koes, and Mio Manole
Status: Provisional patent filed. Screened nearly 100 compounds. Final compound selection to advance for in vivo PK and efficacy has been initiated.
- **Project Title:** Testing a synergistic, neuroplasticity-based intervention for depressive neurocognition
Investigators: Rebecca Price, Sam Poloyac, and Junmei Wang
Status: R01 funded and administrative supplement awarded to assess ketamine and chiral metabolites association with reduced depression symptomatology. Concentration assessment and pharmacometric modeling are included in the awarded supplement.
- **Project Title:** Drug infused liposomal delivery of estrogen modulators and epigenetic regulators for the treatment of lung cancer
Investigators: Adam Soloff and Song Li
Status: Beginning collaboration on liposomal delivery system development
- **Project Title:** Transdermal delivery for scar reduction
Investigators: Peter Rubin, Lisa Rohan, and Sravan Patel
Status: Ongoing collaboration with expansion for topical drug formulation development

Future Opportunities

- Inclusion of a more expanded group of projects that are ongoing in the area of Drug Design, Delivery, and Development.
- Specifically focus on our unique areas of expertise to market to external entities through Making Research Work Initiative.
- Develop a cost model for both internal and external entities by working with the Making Research Work initiative.
- S10 grant submission May 2019 to maintain the presence and high-level functionality of the SMBC within the Drug D3 Center.

Pharmacy Innovation Program

Faculty

Ameer Ali

Ravi Patel

Randall Smith

Representative Publications

- Pharmacy can leverage innovation through hackathons and innovation labs.
 - Aungst, T. D., **Patel, R.**, Pugliese, R., Patel, I., & Boutari, C. (2019). From ideation to practice: How pharmacists and students can leverage hackathons and innovation labs to accelerate innovation in pharmacy. *Journal of the American Pharmacists Association*, 59(2), S25-S29.
- Empowering patients with an accurately reconciled medication and vaccination list require a complementary approach of user-based design and technology development standards.
 - Coons, J. C., **Patel, R.**, Coley, K. C., & Empey, P. E. (2019). Design and testing of Medivate, a mobile app to achieve medication list portability via Fast Healthcare Interoperability Resources. *Journal of the American Pharmacists Association*, 59(2), S78-S85.
- Innovation in education is required to provide student pharmacists the training to enter and practice in the growing need for palliative care.
 - Pruskowski, J., **Patel R.**, Brazeau G. (2019). The Need for Palliative Care in Pharmacy Education. *American Journal of Pharmaceutical Education*, ajpe7410.

Significant Invited Presentations

- Patel, R. "Digital Health 201: Patients and Genomics". Pennsylvania Pharmacist Association Annual Meeting, Champion, PA. (2019).
- Patel, R. "Serious Game Development Community-Driven Design". Serious Play, Orlando FL (2019).
- Patel, R. "Transformational Games- Interventions in Health through Engaging Narrative". Humanities at Work, Pittsburgh PA (2019).

Innovations

- PittChallenge

- Hosted the 2nd Annual Pitt Challenge Hackathon. At this event, students engaged in critical conversations regarding healthcare and pharmacy with industry giants and leading researchers. Students from teams to present their ideas, solutions, and prototypes created in 24 hours. Close to 100 students from 5+ institutions competed.
- Students from the PittChallenge hackathon and from the Electives in the Innovation Lab competed in the IBM Blue Hack hackathon (placing 2nd) and UPMC Childrens' Hospital hackathon (placing 2nd and 3rd)
- Past winner Medicase from 2017 (CEO Colin Wolfe, PharmD 2019) begin trials with their technology first developed at PittChallenge
- Data Science
 - Python for Data Management and Analytics continued to offer student pharmacists to experience the role of programming and data science in health care. This year, an online version of the course was piloted with fifteen student pharmacists.
 - Facilitated a summer internship experience for a rising P3 at Gateway Health Plan.
- Spaceflight Experiment Program
 - The Student Spaceflight Experiments Program (SSEP) has accepted a proposal project from the winning team of PharmD students David Katz, Anu Patel and Mohamed Kashkoush (Class of 2021). Their research proposal titled *Transcriptomic Analysis of Escherichia coli Response to Ciprofloxacin in Microgravity* will investigate the antimicrobial resistance in a closed, high-touch environment aboard the ISS and other space vessels, combined with increased bacterial virulence and human immunosuppression during spaceflight under microgravity conditions. Specifically, the proposal aims to determine the transcriptomic changes that occur in Escherichia coli with exposure to ciprofloxacin in microgravity.

Strengthen Communities





Strengthen Communities

The School of Pharmacy will be a leader in standardizing the elements of practice so that pharmacists enhance the care of patients in the community, in institutions, and during the transitions of care.

We will impact the lives of the people in the communities in which we live and work through pharmacists who are health care providers promoting health and wellness, optimizing use of medications, and stemming the misuse, abuse, and diversion of medications.

PATIENT CARE BY THE NUMBERS FOR FY19

In FY19, faculty:

- 29 faculty provided direct patient care and pharmacotherapy decision making in over 43,000 patients.
- Trained 34 residents and 4 fellows at our Oakland and Shadyside based programs.
- Led *PreCISE-Rx*, the most significant precision medicine implementation project at Pitt/UPMC; to-date, our service has provided standard of care genotyping and clinical consultations to nearly 3000 patients.
- Launched our new Pitt-Thermo-Fisher Scientific PGx Center of Excellence, the first academic-industry partnership focused on pharmacogenomics nationally. With the Clinical and Translational Science Institute (CTSI) recruited over 2000 patients into a new DNA Biobank (Pitt+Me Discovery) and installed new testing equipment capable of testing >1200 genes in biobank participants to support Center research and broad clinical implementation.
- Treated 1187 patients with diabetes referred by 54 primary care physicians to resolve 3281 drug related problems.
- Screened almost 26,000 patients for substance use disorder and referred over 6,500 patients for treatment with over 15,000 patients engaged with treatment.
- Received funding in collaboration with the Program for Healthcare to Underserved Populations from the State Department of Health to improve care for urban isolated patients with chronic disease.
- Administered over 3200 influenza vaccinations in partnership with Falk Pharmacy, University of Pittsburgh Benefits office, and UPMC Employee Health.
- As members of the Geriatrics Program team provided over 250 patient transition of encounters this year.
- Provided care to up to 2,500 patients per month through three community-based family health centers, all of which are designated Level 3 Patient Centered Medical Home (PCMH) by the National Committee for Quality Assurance (NCQA).
- Provided clinical pharmacy palliative care support to 10 hospital-based clinical care teams, 8 outpatient clinics and home-based care teams, and supported 4 CRNPs within UPMC Senior Communities.
- Provided individualized patient care and medication education to 424 patients receiving solid organ transplants.
- The Poison Center managed nearly 80,000 calls from the general public, health care providers, and law enforcement officials.

University Diabetes Care Associates

Faculty

Scott R. Drab

Patient Care

- Treated 1187 patients referred by 54 primary care physicians to resolve 3281 drug related problems.
- Precepted 26 Doctor of Pharmacy students (24 APPE, 2 IPPE) in an ambulatory care rotation.
- Precepted 2 UPMC residents and 1 Master of Social Work student in an ambulatory care rotation.

Significant Invited Presentations

- Unraveling the Science behind Incretin Deficiency and Treatment with GLP-1 Receptor Agonists. Gerontological Advanced Practice Nurses Association Annual Meeting; Washington, DC, September 28, 2018.
- Safe Emerging Options for Using GLP-1 Receptor Agonists in Older Individuals. American Society of Consultant Pharmacists 2018 Annual Convention; Baltimore, MD, November 3, 2018.

Significant Grants

- **Drab SR.** Diabetic Monitoring and Education Grant. \$1500.00, Life Scan Inc., a Johnson & Johnson Company, Milpitas, CA, September 2018.
- **Drab SR.** Diabetic Monitoring and Education Grant. \$600.00, Novo Nordisk, Pittsburgh, PA, September 2018.

The Grace Lamsam Pharmacy Program for the Underserved

Faculty

Sharon Connor
Lauren Jonkman
Karen Pater

Staff

Joni Carroll

Residents

Theo Pham

Patient Care:

- Received funding in collaboration with the Program for Healthcare to Underserved Populations from the State Department of Health to improve care for urban isolated patients with chronic disease with a focus on HTN, DM, COPD and Asthma. With this funding, pharmacists will engage patients through innovative technology and by addressing the social determinants of health patients face that serve as barriers to optimal disease management.
- Received the Senior Vice Chancellor for Engagement's Partnerships of Distinction award, Honorable Mention for the partnership with Health Care for the Homeless.
- Graduated 11 students with an Area of Concentration in Global Health who will go on to advocate for the elimination of health disparities and positively impact the care of patients in resource-limited settings.

Representative Publications:

- Fisher AM, Mtonga TM, Espino JU, **Jonkman LJ, Connor SE**, Cappella NK, Douglas GP. User-centered design and usability testing of RxMAGIC: a Prescription Management and General Inventory Control system for free clinic dispensaries. *BMC Health Services Research* (2018) 18:703
- Drame I, **Connor S**, Hong L, Bimpe I, Augusto J, Yoko-Uzomah J, Weaver S, Assefa F, Portney J, Gardner S, Johnson J, Tofade T. Cultural Sensitivity and Global Pharmacy Engagement in Africa. *Am J Pharm Ed.* 2019; 83 (Issue 4): Article 7222.

Significant Invited Presentations:

- Healthcare Reform: Training Pharmacy Students to Empower Patients to Navigate the Changing Healthcare Environment. Ochs L, Arya V, Connor S, Chim C, Covvey J, Thigpen J. American Association of Colleges of Pharmacy Annual Meeting. Boston, MA. July 23, 2018.
- Coming to America: How Do We Combat Health Disparities for Refugees/Immigrants in Their Host Country? Connor S. American College of Clinical Pharmacy Annual Meeting. Seattle, WA. October 23, 2018.

Significant Grants

- Integrated and Preventive Disease Care for Patients with Chronic Disease RFA 67-64 Community Based Health Care Program. Pennsylvania Department of Health (Connor, Jonkman Co-Investigators).

UPMC Presbyterian Ambulatory Clinics and Pharmacies

Faculty

James Coons
Deanne L. Hall
Karen S. Pater
Christine Ruby-Scelsi
Amy L. Seybert

Residents

John Aurora
Hannah Nystrom

Patient Care:

- Cost savings and Revenue Initiatives
 - Determinations of anticoagulation reimbursement at non-hospital-based outpatient physician office. July 2019. Over the course of 1 year, it is estimated that anticoagulation management within the Heart and Vascular Institute brings in a revenue of ~\$114,000 based on 7616 anticoagulation episodes completed. **(Hall/Junker/Hovis)**.
- Improving Health of Patients and Innovative Health Care Delivery
 - Anticoagulation management with the Heart and Vascular Institute over a one-year period showed pharmacist facilitating ~200 interruptions to warfarin therapy for procedures, ~100 transitions of care on hospital discharge and adjustment of monitoring of anticoagulation for 380 drug interactions. **(Hall/Junker/Hovis)**.

- Falk Pharmacy Influenza Vaccination Program continues to collaborate with the University of Pittsburgh Benefits Office and UPMC Employee Health to provide over 3260 influenza vaccinations to the University and UPMC Presbyterian employees. (Coordinator: **Hall**.)

Representative Publications:

- **Coons JC**, Patel R, Coley KC, Empey PE. Design and testing of MEDivate, a mobile app to achieve medication list portability using HL-7 FHIR. *J Am Pharm Assoc* 2019;59:S78-85.e2.
- **Coons J**. Pulmonary Arterial Hypertension (PAH). PharmacyLibrary's PharmacotherapyFirst: Multimedia Learning Resource. Washington, DC: American Pharmacists Association; 2018.

Significant Invited Presentations:

- “Management and Trends in Pulmonary Arterial Hypertension.” Presenter. American Society of Health-System Pharmacists (ASHP) 53rd Midyear Clinical Meeting and Exhibition. Presented to pharmacists and nurses, Anaheim, CA, December 5, 2018. American Council on Pharmaceutical Education (ACPE) universal program number: 0221-0000-18-395-L01-P. (**Coons**)
- “Opportunities to Improve HIV Prevention Curriculum and PrEP Utilization in an Urban Family Health Center.” UPMC Family Medicine Scholarship Day, UPMC Altoona, May 2019 (**Aurora**)

UPMC St. Margaret Family Medicine

Faculty

Roberta Farrah

Residents

Ariel Ferdock

Pooja Kirpekar

Sara Weinstein

Patient Care:

- The family medicine residency program consists of three community-based family health centers that are models for academic interprofessional primary care practice. Pharmacists practice alongside family medicine and psychiatry physicians, nurses, social workers, behavioral health specialists, nutritionists, and patient case managers to provide comprehensive patient-centered care.
- All three have received Level 3 Patient Centered Medical Home (PCMH) status by the National Committee for Quality Assurance (NCQA). The family health centers see a patient volume of up to 2,500 visits per month, as a mix of pediatric and adolescent, adult, and geriatric medicine.
- Pharmacists practice in face-to-face scheduled office encounters for acute and chronic conditions, telephone medicine managing recent ER and inpatient admissions for medication reconciliation and care coordination, group visits, home visits, population health management, and drug policy development and review. Provided leadership and management of naloxone prescribing, dispensing and education initiative, team-based medication-assisted treatment (MAT) for alcohol and opioid abuse, and treatment of hepatitis C in primary care.
- Primary care pharmacists provide leadership and partnership within UPMC to advance pharmacist practice by supporting pharmacist billing for chronic care management (CCM) and transitional care management (TCM).

Representative Publications:

- **Kirpekar P**, Turco N, Castelli G. In patients with hypertension, does chlorthalidone lead to better outcomes than hydrochlorothiazide? Help Desk Answer (HDA). *Evidence-Based Pract*, 2019.
- **Weinstein SD**, Copenhaver AM, Koenig ME. Do patients on extended courses of systemic corticosteroids benefit from oral bisphosphonate therapy to prevent steroid-induced osteoporosis? *Evidence-Based Pract*. July 2018.
- Castelli G, Bacci J, Dombrowski SK, Osborne M, Difilipo A, Klatt PM, McGivney MS. Pharmacist-delivered comprehensive medication management within family medicine practices: an evaluation of the SCRIPT Project. *Fam Med* 2018 Sep;50(8):605-12.

Significant Invited Presentations:

- **Ferdock A**, Castelli G, D'Amico F. REFRAME TOC: PhaRmacists Enhancing Follow up, Reducing and Assisting with Medication Errors through Transitions of Care. 52nd Society of Teachers of Family Medicine (STFM) Annual Spring Conference, Toronto, Canada, May 2019.
- **Kirpekar P**, Koenig M, **Farrah RM**. Improving Professional Collaboration: Diabetes and Behavioral Health Follow-up in a Family Health Center. Presented at the 52nd Society of Teachers of Family Medicine (STFM) Annual Spring Conference, Toronto, Canada, May 2019.
- **Weinstein S**, **Ferdock A**. An App Can Do That: Point of Care Apps for FP's, Residents, and Students. Presentation at the 52nd STFM Annual Spring Conference. Toronto, Ontario. May 2019
- **Innovations:**
- Pharmacist-as-educators in precepting UPMC St. Margaret Family Medicine physician residents on required and elective rotations, UPMC St. Margaret PGY1 pharmacy practice residents, and the University's Community Pharmacy Practice residents, and medical/pharmacy IPPE and APPE student learners.
- Improving Access to Asthma Controller Inhalers in Pittsburgh Public Schools. UPMC St. Margaret Family Health Centers and Breathe Pennsylvania.

HOSPITAL-BASED PROGRAMS

UPMC Palliative and Supportive Institute

Faculty

Jennifer Pruskowski

Patient Care:

- Provided clinical pharmacy support to ten hospital-based clinical palliative care teams, 8 outpatient clinics and home-based palliative care teams, and supported 4 palliative care CRNPs within UPMC Senior Communities
- Deprescribed 45 residents of potentially inappropriate or unnecessary medications through the DE-PHARM (Discussion to Ensure the Patient-centered, Health-focused, prognosis-Appropriate, and Rational Medication regimen) initiative at UPMC Seneca Place Senior Community
- Implemented the first deprescribing-focused collaborative practice agreement between a pharmacist and physician
- Care for over 30 patients within the Palliative Care Pharmacotherapy Clinic for oncology-palliative care patients within Hillman Cancer Center
- Counseled approximately 50 patients on intranasal naloxone prior to discharge from UPMC Shadyside

- Implemented the Geriatric and Palliative Care Area of Concentration to personalize the learning of 15 student pharmacists interested in caring for geriatric and palliative care patients

Representative Publications

- Schenker Y, Park SY, Jeong K, **Pruskowski J**, Kavalieratos D, Resick J, Abernethy A, Kutner J. Associations between polypharmacy, symptom burden, and quality of life in patients with advanced, life-limiting illness. *J Gen Intern Med.* 2019 Feb 4. doi: 10.1007/s11606-019-04837-7. [Epub ahead of print]
- **Pruskowski J**, Sakely H, Handler SM. Development of a required longitudinal deprescribing-focused experience within the DE-PHARM project for geriatric pharmacy residents. *Am J Health Syst Pharm.* 2019 Feb;76(4): 236-241.
- Felton M, Jarret J, Hoffmaster R, D'Amico F, Sakely H, **Pruskowski J**. Comparison of haloperidol, non-haloperidol antipsychotics, and no pharmacotherapy for the management of delirium in an inpatient geriatric palliative care population. *J Pain Palliat Care Pharmacother.* 2018 Jun - Sep;32(2-3):141-148. doi: 10.1080/15360288.2018.1513434.

UPMC Pharmacy Solid Organ Transplantation Group

Edward Horn
 Carlo Iasella
 Heather J. Johnson
 Kristine S. Schonder
 Raman Venkataramanan

Patient Care

- Provided individualized patient care and medication education to 424 patients receiving solid organ transplants.
- Collaborated with nursing to develop a multidisciplinary education class for all new abdominal transplant recipients and their families.
- Expanded pharmacy services to heart transplant and heart failure patients by developing new clinical services, protocols, and processes to enhance communication among team members.

Representative Publications

- Popescu I, Mannem H, Winters SA, Hoji A, Silveira F, McNally E, Pipeling MR, Lendermon EA, Morrell MR, Pilewski JM, Hanumanthu VS, Zhang Y, Gulati S, Shah PD, **Iasella CJ**, Ensor CR, Armanios M, McDyer JF. Impaired CMV Immunity in Idiopathic Pulmonary Fibrosis Lung Transplant Recipients with Short Telomeres. *Am J Respir Crit Care Med.* 2018 Aug 8. *Am J Respir Crit Care Med.* 2019 Feb 1;199(3):362-376.
This manuscript is the first study linking short telomeres as a genetic risk factor for CMV viremia and relapse after transplant. May guide future work on duration of CMV prophylaxis.
- Ensor CR, Goehring KC, **Iasella CJ**, Moore CA, Lendermon EA, McDyer J, Morrell MR, Sciortino CM, **Venkataramanan R**, Wiland AM. Belatacept for Maintenance Immunosuppression in Cardiothoracic Transplantation: The Potential Frontier. *Clin Transplant.* 2018 Oct;32(10):e13363.
This manuscript is the first review article to describe the use of belatacept as a novel immunosuppressant for cardiothoracic transplantation.

- Wu X, Clancy CJ, Rivosecchi RM, Zhao W, Shields RK, Marini RV, **Venkataramanan R**, Nguyen MH. Pharmacokinetics of Intravenous Isavuconazole in Solid-Organ Transplant Recipients. *Antimicrob Agents Chemother*. 2018 Nov 26;62(12). pii: e01643-18. doi: 10.1128/AAC.01643-18. Print 2018 Dec. PubMed PMID: 30275091; PubMed Central PMCID: PMC6256763.

This manuscript identified PK variability and factors that influence PK of isavuconazole in transplant patients.

Significant Invited Presentations

- **Schonder, KS**. “Optimizing Vaccinations Pre-Transplant.” Featured Multidisciplinary Transplant Professionals Symposium Expansion of the Multidisciplinary Team: From Waitlist to Transplant.” American Transplant Congress ATC (2019), Boston, MA, June 2019.
- **Horn E**. “Seeing the Light: Antibodies in Thoracic Transplantation.” Symposium Chair, ISHLT 2019 Annual Meeting, Orlando, FL, April 2019.
- **Venkataramanan R**. “PBPK in Pregnancy.” Presented to CDC, August 2018.
- **Venkataramanan R**. “Pharmacokinetics in Pregnancy”. Presented at Obstetric-Fetal Pharmacology: Practical Prescribing and Research Methods Update Conference, Northwestern University, Chicago, IL, November 2018.

Significant Grants

- R01 HD096796. Pharmacologically-based Strategies for Buprenorphine Treatment During Pregnancy. National Institutes of Health 2018-2023 PI: **Venkataramanan R**.
- PBPK and Population Pharmacokinetic Analysis of Treprostonil. United Therapeutics 2018-2020 PI: **Venkataramanan R**.
- Microbiome and Host Responses of CLAD in CF Patients. Cystic Fibrosis Foundation 2019-2020 Co-Investigators: McDyer J, **Iasella CJ**.

Innovations

- Identified a novel pharmacological method of liver preservation.
- Identified potential method to improve kidney preservation.
- Evaluated function of donor livers after liver donation.
- Evaluated active secretion capacity in kidney transplant patients.

UPMC Pharmacy Critical Care Group

Faculty

James C. Coons	Sandy Kane-Gill
Neal J. Benedict	Thomas D. Nolin
Philip E. Empey	Samuel Poloyac
Bonnie A. Falcione	Amy Seybert
Pamela Smithburger	

Residents

Lindsay Moreland
Caitlin McHugh

Patient Care

- Appointed to the Kidney Disease: Improving Global Outcomes (KDIGO) AKI Clinical Controversies Conference, Rome, Italy **Kane-Gill SL**
- Elected Treasurer for the Society of Critical Care Medicine (**Kane-Gill SL**) and Chair positions for ACCP Cardiology Practice and Research Network (**Coons JC**), AACP Pharmacogenomics (**Empey PE**) and Assessment (**Benedict NJ**) Special Interest Groups.
- Fellow of the Society of Critical Care Medicine's American College of Critical Care medicine. (**Smithburger P**)

Representative Publications

- **Benedict NJ**, Wong A, Cassidy EA, Lohr BR, Pizon TF, **Smithburger PL**, **Falcione B**, Kirsci L, **Kane-Gill SL**. Predictors of resistant alcohol withdrawal. *Drug Alcohol Depend* 2018;192:303-8.
 - *Demonstrate the predictive ability of a history of psychiatric illness, thrombocytopenia, gender, race, baseline severity of illness and comorbidity scores for developing severe alcohol withdrawal. Considering these characteristics in early withdrawal management may prevent progression to severe withdrawal outcomes.*
- Stubbs JR, Stedman MR, Liu S, Long J, Franchetti Y, West RE, Prokopienko AJ, Mahnken JD, Chertow GM, **Nolin TD**. Trimethylamine N-oxide and cardiovascular outcomes in patients with end-stage kidney disease receiving maintenance hemodialysis. *Clin J Am Soc Nephrol* 2019;14(2):261-267. PMID: 30665924.
 - *Demonstrated that Trimethylamine N-oxide (TMAO) concentrations are significantly higher in patients with end-stage kidney disease, despite receiving chronic hemodialysis*
- **Coons JC**, Iasella CJ, Thornberg M, Fitzmaurice M, Goehring K, Jablonski L, Leader D, Meyer A, Seo H, **Benedict NJ**, Smith R. Clinical outcomes with unfractionated heparin monitored by anti-factor Xa vs. activated partial thromboplastin time. *Am J Hematol* 2019;94:1015-19.
 - *This is the largest study to date which evaluated clinical outcomes with anti-Xa and aPTT for heparin monitoring.*

Significant Invited Presentations

- International and National Neurotrauma Society Meeting. "Drug Discovery and Development to Advance Preclinical and Clinical Translation" Toronto, CA, August 2018. **Poloyac SM**.
- State of the Art Case Based Lecture: WHO Should Get What? A WHO PAH Group-Based Approach to Treatment. Session: Clearing the Air on Pulmonary Arterial Hypertension: Pharmacology Session I. American College of Cardiology 68th Annual Scientific Sessions and Expo. New Orleans, LA. **Coons JC**.
- Pharmacokinetic modeling and neuropharmacometabolomics to ensure target engagement, National Neurotrauma Symposium in Toronto, CA, August 2018. **Empey PE**

Significant Grants

- NIH/NIDDK R01 (DK116957-01A1); "Population Health Management to Optimize Care in CKD (PANOPTIC-CKD)" 2018 – 2023. **Nolin TD** (Co-I)
- R21/R33 NS107785 (MPI: **Poloyac SM** and McDermott LA). NINDS: Innovation Grants to Nurture Initial Translational Efforts (IGNITE). Period of Support: 07/15/2018 – 07/14/2021. *20-HETE Formation Inhibitors in Cardiac Arrest*.
- Industry-Sponsored Study, United Therapeutics. "ADAPT (A Patient Registry of the Real-world Use of Orenitram)," 2019-2020. **Coons JC** (PI).

Innovations

- Barreto EF, Voils SA, Rule AD, **Kane-Gill SL**. Innovative use of novel biomarkers to improve the safety of renally-eliminated and nephrotoxic medications. *Pharmacotherapy* 2018; 38:794-803. Dr. Kane-Gill discusses the novel uses of structural and functional biomarkers to prevent drug associated acute kidney injury some of which have been implemented at UPMC with an approved pharmacist led protocol.
- McDermott, LA; **Poloyac SM**; Koes, D. “20-HETE formation inhibitors” Provisional Patent Application. Appl No. 62/803,398

UPMC Infectious Diseases and Antibiotic Management Program (AMP)

Faculty

Brian A. Potoski

Bonnie A. Falcione

Patient Care

- Worked collaboratively with stakeholders in the Infectious Diseases division and the Antibiotic Management Program across UPMC Presbyterian and Shadyside campuses to create recommendations for antimicrobial dose and infusion time optimization spanning the spectrum of renal and hepatic function. This was approved and implemented in the late Spring of 2019 by the Presbyterian and Shadyside local campus Pharmacy & Therapeutics Committee.
- Currently updating the Antimicrobial Guide to Chemotherapy for publication. This guide, which will be the 11th edition published since 2005, provides current recommendations and pathways for the treatment of antimicrobial infections to healthcare faculty, staff, and trainees across UPMC hospital campuses. At last printing, over 3,000 books were printed and distributed.
- Collaborated to improve the time to patients’ receipt of antibiotics in the setting of positive blood cultures through automated decision support technology. This QI initiative is ongoing with preliminary data to follow in early 2020.

Significant Grants

- **Potoski BA**, Nguyen MH. The real-world use of bezlotoxumanb for the prevention of C. difficile disease recurrence. Merck Pharmaceuticals, Investigator Initiated Research. \$42,000 with second year extension.

Innovations

- In 2019, The UPMC Presbyterian Campus Antimicrobial Stewardship Program continued to be a Center of Excellence for Antimicrobial Stewardship as initially awarded by the Infectious Diseases Society of America (IDSA) in 2018. This prestigious designation identifies institutions and their stewardship programs that promote excellence in antimicrobial use and combating antimicrobial resistance.

UPMC System Formulary Management and Drug Use Policy

Faculty

Colleen M. Culley

Patient Care:

- **179** formulary guidelines/class reviews/interchanges/consent agenda recommendations for medication use across UPMC hospitals. **Culley CM**, other faculty, clinical pharmacists, and PGY1/PGY2 residents mentored by faculty and clinical pharmacists.
- **6** medication therapeutic class reviews to promote cost-effective medication selection for UPMC patients. **Culley CM**
- Reference tools were created/maintained, including System online formulary, System Pharmacy Infonet page, ‘No-buy’ list, therapeutic interchange chart, and automatic renal dosing chart **Culley CM**
- Pharmacy Service Center conducted an approved quality improvement project titled, Implications and Management of Anti-Xa Concentration Interference in Patients Transitioning from Factor Xa Inhibitors to Unfractionated Heparin. This project evaluated the changes implemented in the eRecord to improve patient safety and monitoring of heparin for patients who have received factor Xa inhibitor. Team of investigators included clinical pharmacists from the Pharmacy Service Center and faculty, **Culley CM**, Coons JC.

Geriatrics (Benedum and Shadyside Senior Care Institute) Program

Faculty

Christine M. Ruby-Scelsi

Patient Care:

- Establishment of pharmacist role in for transitions-of-care (TCM) and chronic care management (CCM) encounters within the Geriatrics Clinics. Our clinical work is an important component of a UPMC demonstration project to utilize the TCM billing codes, sharing of discharge information across sites, and confirmation of home care services. The team provided at least 250+ patient transition of care encounters last year. The pharmacists continue to provide and refine state-of-the-art direct patient care pharmacy services within Benedum and Senior Care’s Patient-Centered model with comprehensive medication management, and chronic care management (CCM aka “UPMC Focused Care”). **Ruby CM and Suhrie EM**
- Delivered five Special Topic elective courses focusing on transitions-of-care or osteoporosis. **Ruby CM.**
- Organized and led three pharmacist provided immunization clinics at Senior Care. **Ruby CM.**

Representative Publications:

- Howerton M, Suhrie E, Jones N, Gennari A, and **Ruby CM.** Evaluation of direct oral anticoagulant dosing and monitoring in two geriatric outpatient clinics. The Senior Care Pharmacist, Volume 34, Number 3, March 2019, pp. 192-205(14).

Significant Invited Presentations:

- Pharmacists in Chronic Care and Transitional Care Management: Essential Team Members Invited speakers presented at the American Society of Consultant Pharmacists Annual Meeting; National Harbor, MD on November 3, 2018. **Ruby CM** and Suhrie EM.
- **Ruby CM** and Pruskowski J. Development of an Area of Concentration in Geriatrics and Palliative Care. Presented at the American Society of Consultant Pharmacists Annual Meeting; National Harbor, MD; November 2, 2018.

- Ioannou K, Mansour D, Thompson T, Chatellier K, Schwenk A, **Ruby CM**. Development of an ASCP Student Chapter at the University of Pittsburgh. Presented at the American Society of Consultant Pharmacists Annual Meeting; National Harbor, MD; November 2, 2018.
- Thompson T and **Ruby CM**. Report on Project in Progress: Impact of Pharmacy-Driven Transitions of Care Calls on Discovery and Correction of Medication Discrepancies Post-Discharge. Presented at the Pennsylvania Pharmacist Association Mid-Year Meeting; Gettysburg, PA; January 26, 2019.

Significant Grants:

- Title: Pittsburgh SBIRT: Training Health Professions Students to Conduct SBIRT Sponsor: SAMHSA # TI026423. PI: Reynolds, M. Role: **Ruby, CM (Council of Directors)**

Pittsburgh Poison Center (PPC)

Faculty

Amanda S. Korenoski

Patient Care

- Availability and use of naloxone to reverse opioid overdoses has increased over the past year. The SOP and Pittsburgh Poison Center (PPC) have done significant education to a variety of groups and organizations to educate the public on both overdose signs and use of naloxone (see innovations).
- The Poison Center, led by Dr. Korenoski, managed nearly 80,000 calls from the general public, health care providers, and law enforcement officials. Over 90% of cases were able to be managed from home, preventing unnecessary emergency room visits. Very positive satisfaction scores have been collected and analyzed from callers.
- Dr. Korenoski is a clinical pharmacist on the in-patient toxicology team at UPMC Presbyterian Shadyside. The team oversees consults at six local UPMC facilities and is one of the busiest services in the country. It is a very active teaching experience, with many medical and pharmacy students and residents rotating through.

Innovations

- The SOP, in partnership with the Pittsburgh Poison Center, utilized simulation to educate a variety of groups on opioid overdose symptoms and effect on naloxone administration in an overdose patient. These presentations were given to a variety of audiences, including general public, state prison officials, public health agencies, social workers, and health care providers.
- Dr. Korenoski led the development of an innovative strategy for teaching PharmD students about Population Health. Simulated poison center exposure data was provided to students, who were instructed to identify a need within that population. Students worked in small groups to analyze the public health problem and create an intervention to address the needs of the community.
- Significant partnerships have been made and strengthened with community groups directly and indirectly related to health care facilities. These include hospitals in 44 counties in Southwestern and Central PA, the FBI Pittsburgh Division's Heroin Outreach Prevention Education (HOPE) Initiative, Merck Adult Out-patient Clinic for those with intellectual disabilities, Safe Kids Allegheny County, the PA Pharmacists Association, and others.
- Partnerships with local, county, and state public health organizations have paved the way for unique poison center utilization, including real-time surveillance of exposures statewide, warm handoff programs for those suffering from substance use disorders, emergency preparedness activities, and antimicrobial stewardship telephonic services.

Build Foundational Strength





Build Foundational Strength

Achieving the vision of the School of Pharmacy requires a financial and space resource base that supports faculty, staff, and students in their endeavors. Because the people of the School of Pharmacy are one of its greatest resources, information about faculty, staff, and alumni appears in this section.

We will partner with our stakeholders and communities to develop the resources to advance our mission.

RESOURCES BY THE NUMBERS FOR FY19

- **\$29.5 million:** The total School of Pharmacy expenditures in FY19 from all sources.
- **\$29.2million:** The market value of the School's endowment at the end of FY19.
- **\$2,335,830:** Gifts in FY19
- The School of Pharmacy has an allocation of and/or leases **112,977 SF** of space in **seven (7) locations** in Oakland and the East End.
- **\$261 per SF:** Efficiency measured as expenditures divided by total number of square feet occupied.
- In FY19, the School of Pharmacy had **69 full-time faculty members; 19** were recipients of **31** awards for their accomplishments.

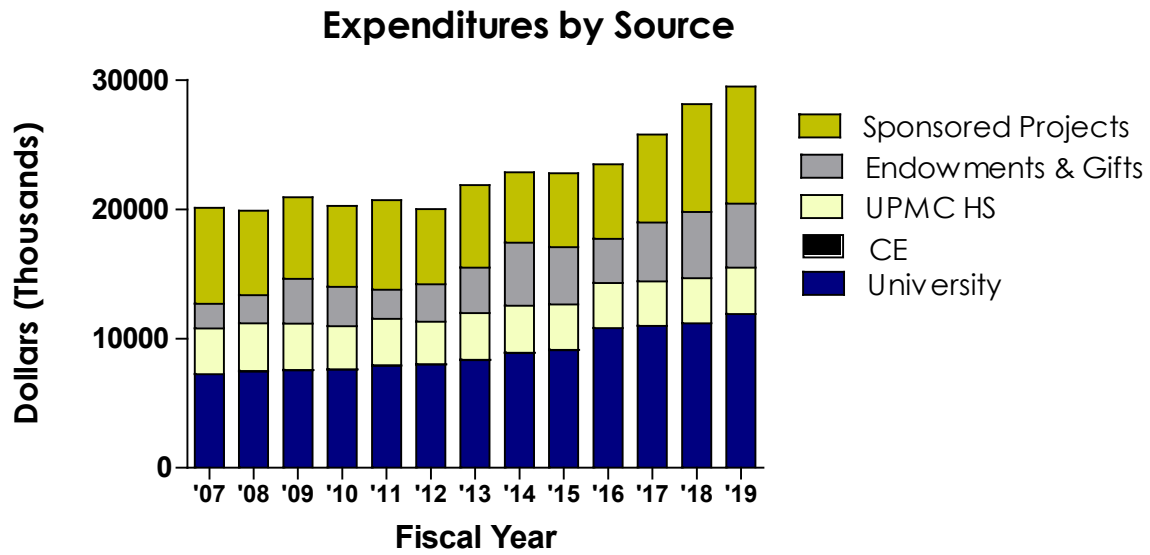
Of our **69** faculty members,

- **17 (25%)** have been elected to fellowship in one or more organizations.
- **24 (35%)** are board certified.
- **36 (52%)** are board certified, fellows, or both.
- **98:** The number of staff members. Thirty-one (**31**) are administrative and **67** are research
- Number of living alumni: **5,627**
- The School of Pharmacy's alumni ranked:
 - **#2** among all University schools and programs in alumni engagement.
- **25 percent** of the alumni were engaged with the School of Pharmacy and/or University in some way.
- **6** major print communications were each mailed to **6,132** stakeholders and **12** others to a more limited distribution list.
- An average of **6,267** users visited the School's website monthly.

FINANCIAL RESOURCES

Budget

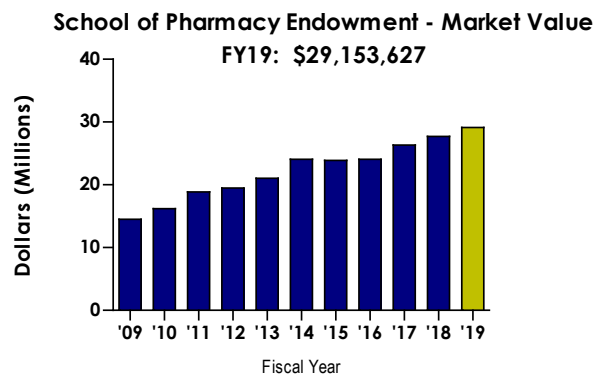
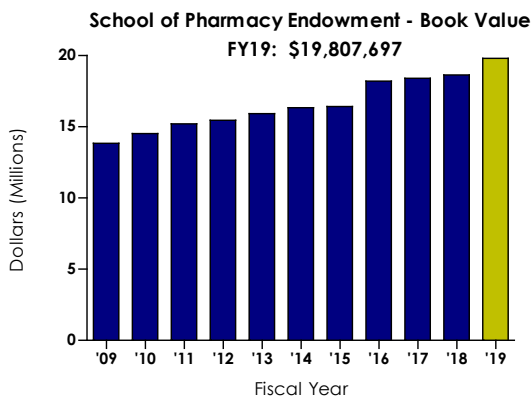
Sources of funding for the School of Pharmacy include allocation from the University of Pittsburgh, UPMC, continuing education and auxiliary accounts, gifts and endowments, and sponsored project awards. The graph below represents financial expenditures for fiscal years '09 through '19.



The School of Pharmacy’s expenditures in FY19 totaled \$28,142,278. Sponsored projects accounted for 31% of the expenses in FY19. Together, the University (40%), sponsored project awards (31%), and UPMC (12%) accounted for over 80% of the School’s funding in FY19.

Institutional Advancement

The value of the School of Pharmacy is recognized in many ways, including philanthropic support.

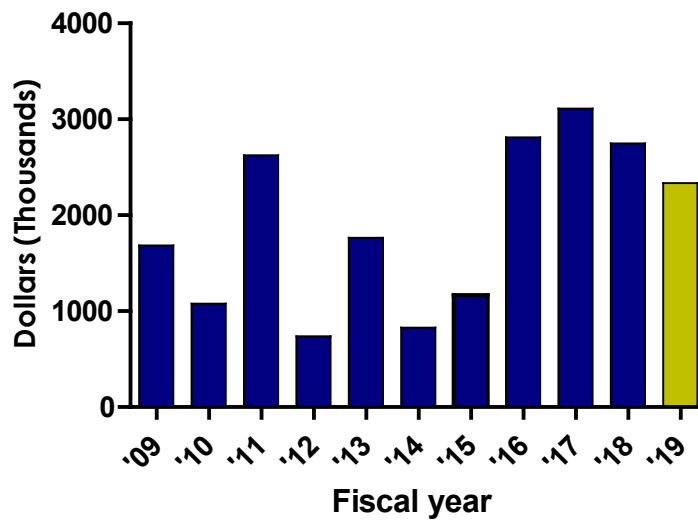


In FY19, the School of Pharmacy received charitable gifts, pledges, and grants totaling \$2,335,830 from a total of 647 individuals, foundations, corporations, and other organizations. Of the total, \$1,080,084 was from corporations and organizations and was primarily designated to benefit technological renovations and research.

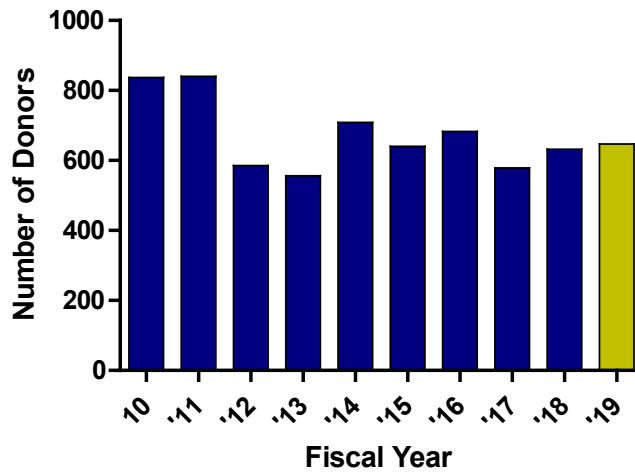
FY19 Giving to the School of Pharmacy by Source

	Alumni	Foundations	Corporations	Organizations	Friends
Amount	\$410,338	\$567,418	\$283,126	\$796,958	\$277,990
Percentage	17.6%	24.3%	12.1%	34.1%	11.9%

Total Gifts & Pledges by Year



Annual Donors FY19

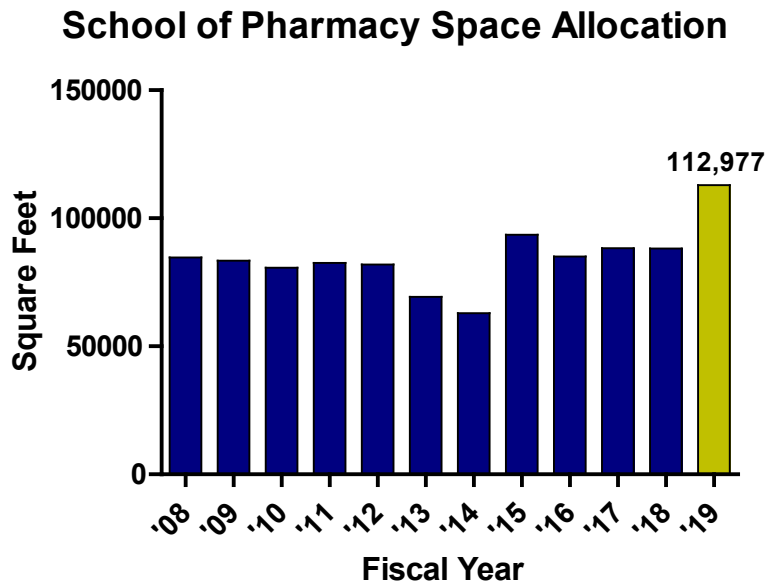


PHYSICAL FACILITIES

At the close of FY19, the School of Pharmacy occupied a total 112,977 SF including:

- 57,625 SF in Salk Hall* (10,299 SF is occupied, 47,326 SF is under renovation)
- 22,852 SF in Salk Pavilion*
- 2,283 SF Commons in Salk Pavilion*
- 619 SF in BST III*
- 279 SF in 3609 Forbes Avenue*
- 14,841 SF (leased) at The Offices @ Baum
- 14,478 (Leased) at the PTC Building

*University space



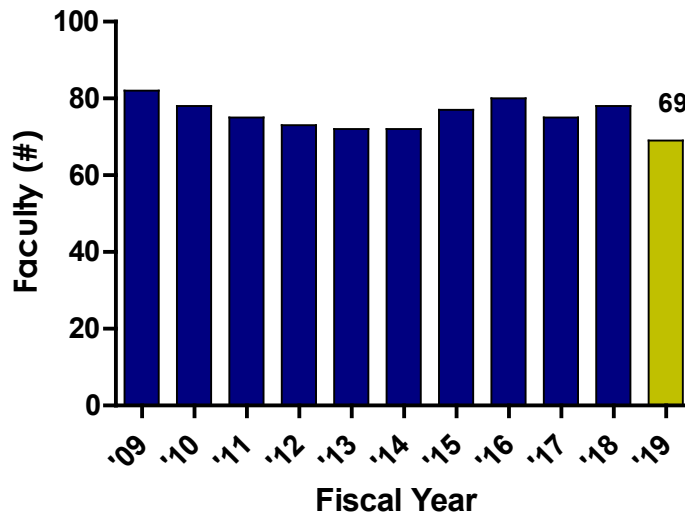
THE RESOURCE OF PEOPLE

We formally recognize that the people of the School are its most valuable resource, and therefore include people in the Resource Section.

Faculty

Sixty-nine full-time and fourteen part-time faculty members comprise the School of Pharmacy, all of whom hold faculty appointments in either the Department of Pharmaceutical Sciences or the Department of Pharmacy and Therapeutics. The changes in number of faculty in the past decade are shown in the graph.

Full-Time Faculty Members



In the Department of Pharmaceutical Sciences:

- Jaden Jungho Jun, PhD was recruited from the University of Kansas, Department of Pharmaceutical Chemistry.

In the Department of Pharmacy and Therapeutics:

- Faculty members, Carolyn and Joshua Thorpe resigned and accepted faculty positions at the University of North Carolina, Chapel Hill.
- Three new faculty members were hired into the department:
 - Edward T. Horn, PharmD, BCCCP
 - Carlo J. Iasella, PharmD, BCPS
 - Leslie L. Gingo, PharmD, BCPS

Full-Time Faculty Rank by Department of Primary Appointment*

Faculty Rank	Pharmaceutical Sciences	Pharmacy and Therapeutics	Total for School of Pharmacy
Professor	13	5	18
Associate Professor	4	18	22
Assistant Professor	9	15	24
Instructor	1	1	2
Research Assistant Professor	3	0	3
All Faculty	30	39	69

*Part-time Faculty (numbers not in table) include:

Department of Pharmaceutical Sciences: 7

Department of Pharmacy and Therapeutics: 7

In FY19, School of Pharmacy faculty members earned a total of 31 major awards.

FY19: Faculty Awards, Honors, and Recognitions

Faculty Member	Award	Organization
Neal Benedict	Faculty Preceptor of the Year	University of Pittsburgh School of Pharmacy
Lucas Berenbrok	Brenneman Award	University of Pittsburgh School of Pharmacy
Sharon Connor	SVC for Engagement's Partnerships of Distinction	University of Pittsburgh
Tanya Fabian	Values Award	UPMC - Operations Pharmacy Integration Council
Barry Gold	Professor Emeritus of Pharmaceutical Sciences	University of Pittsburgh
Lorin Grieve	Provost Award for Diversity and Inclusion in the Curriculum	University of Pittsburgh, Department of the Provost
Inmaculada Hernandez	Forbes 30 Under 30	Forbes Magazine
	Outstanding Scholarly Contribution Award	Rho Chi Society
	Delta Omega Public Health Honor Society Inductee	Delta Omega Public Health Honor Society
	Fellow	American College of Cardiology
	2018 ASHP Student Research Paper Award of the Year. Senior Author and Research Mentor	American Society of Health-System Pharmacists
	Honorable Mention Award. Given under the Clinical Sciences category at the Aging Institute's Research Day. Senior Author and Research Mentor.	Aging Institute, Pittsburgh PA
Edward Horn	ISHLT Pharmacy and Pharmacology Council Vice-Chair	International Society for Heart and Lung Transplant
Carlo Iasella	Immunology/Transplantation PRN Junior Investigator Award	American College of Clinical Pharmacy
Lauren Jonkman	Partnership of Distinction Honorable Mention	University of Pittsburgh
Sandra Kane-Gill	Commitment to Pharmacy Excellence – Inaugural Award	West Virginia University Hospitals
Melissa Somma McGivney	Faculty of the Year	University of Pittsburgh APhA-ASP Student Organization
	Fellow	Atlantic Coast Conference Academic Leaders Network
Susan Meyer	COIT Lecture Award	University of Arizona
	Hugh C. Muldoon Lecture Award	Duquesne University
Jennifer Pruskowski	New Clinical Practitioner Award	American College of Clinical Pharmacy
Lisa Rohan	\$3,000 funding under the NSF I-Corps Site Program. Awarded funding to conduct customer discovery for the developed vaginal film product (HerShield)	University of Pittsburgh
	Pitt Chancellors Early Stage Commercialization Award, First Prize \$20,000 through Pitt Ventures First Gear Program	University of Pittsburgh

Faculty Member	Award	Organization
	Pitt Innovator Award at 2018 Celebration of Innovation University of Pittsburgh	University of Pittsburgh
Kristine Schonder	Innovation in Teaching Award	Rho Chi Society
Amy Seybert	ACPE Board of Directors	American Colleges of Pharmacy Education - American Pharmacists Association
	Fellow	Atlantic Coast Conference Academic Leaders Network
Wen Xie	Zhi-Jun Wang Memorial Lecture	School of Basic Medical Sciences, Peking University Health Science Center
	Joy Goodwin Lectureship	College of Veterinary Medicine, Auburn University
	2019 Graduate Program Faculty Member of the Year Award	University of Pittsburgh
Da Yang	Research Scholar Award	American Cancer Society

Fellowships in Organizations and Board Certification

Election to fellowship and board certification are two characteristics of faculty members who have distinguished themselves. Of the 69 faculty members, 17 (25%) have been elected to fellowship in one or more organizations, and 24 (35%) are board certified. The names, letters indicating the fellowship, and department of affiliation are shown in the table. The organization of the fellowship is indicated at the first use of the initials in the table.

FY19: Faculty Elected to Fellowship in Professional or Scientific Organizations

Name	Fellowship		Department
Kim Coley	ACCP	American College of Clinical Pharmacy	Pharmacy and Therapeutics
James Coons	ACCP	American College of Clinical Pharmacy	Pharmacy and Therapeutics
Amy Donihi	ACCP	American College of Clinical Pharmacy	Pharmacy and Therapeutics
Inmaculada Hernandez	ACC	American College of Cardiology	Pharmacy and Therapeutics
Barry Gold	AAAS	American Association for the Advancement of Science	Pharmaceutical Sciences
Sandra Kane-Gill	ACCM	American College of Critical Care Medicine	Pharmacy and Therapeutics
	ACCP	American College of Clinical Pharmacy	
Patricia Kroboth	ACCP	American College of Clinical Pharmacy	Pharmaceutical Sciences
	AAPS	American Association of Pharmaceutical Scientists	
	AAAS	American Association for Advancement of Science	

Name	Fellowship		Department
Melissa Somma McGivney	APhA	American Pharmacists Association	Pharmacy and Therapeutics
	ACCP	American College of Clinical Pharmacy	
Thomas Nolin	ACP	American College of Clinical Pharmacology	Pharmacy and Therapeutics
	ACCP	American College of Clinical Pharmacy	
	ASN	American Society of Nephrology	
Samuel Poloyac	AACP Academic Leadership Fellow	American Association of Colleges of Pharmacy	Pharmaceutical Sciences
	ACCM	American College of Critical Care Medicine	
Christine Ruby-Scelsi	ASCP	American Society of Consultant Pharmacists	Pharmacy and Therapeutics
Paul Schiff	APhA	American Pharmaceutical Association	Pharmaceutical Sciences
	AAPS	American Association of Pharmaceutical Scientists	
Amy Seybert	ASHP	American Society of Health System Pharmacists	Pharmacy and Therapeutics
	ACCP	American College of Clinical Pharmacy	
Susan Skledar	ASHP	American Society of Health System Pharmacists	Pharmacy and Therapeutics
Randall Smith	AAPS	American Association of Pharmaceutical Scientists	Pharmaceutical Sciences
Pam Smithburger	ACCP	American College of Clinical Pharmacy	Pharmacy and Therapeutics
	ACCM	American College of Critical Care Medicine	
Raman Venkataramanan	AAPS	American Association of Pharmaceutical Scientists	Pharmaceutical Sciences
	ACCP	American College of Clinical Pharmacology	

FY19: Faculty Board Certifications

Name	Certification		Department
Sherrie Aspinall	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
Lucas Berenbrok	BCACP	Ambulatory Care Pharmacy	Pharmacy and Therapeutics
	CTTS	Tobacco Treatment Specialist	
James Coons	BCCP	Cardiology Pharmacy	Pharmacy and Therapeutics
Colleen Culley	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
Amy Donihi	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
Scott Drab	CDE	Diabetes Educator	Pharmacy and Therapeutics
	BC-ADM	Advanced Diabetes Management	
Tanya Fabian	BCPP	Psychiatric Pharmacy	Pharmacy and Therapeutics

Name	Certification		Department
Bonnie Falcione	BCPS (AQ-ID)	Pharmacotherapy (Added Qualification in Infectious Disease)	Pharmacy and Therapeutics
Roberta Farrah	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
	BCACP	Ambulatory Care Pharmacy	
Leslie Gingo	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
Deanne Hall	CDE	Diabetes Educator	Pharmacy and Therapeutics
	BCACP	Ambulatory Care Pharmacy	
Edward Horn	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
	BCCCP	Critical Care	
Carlo Iasella	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
Heather Johnson	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
Amanda Korenoski	BCCCP	Critical Care	Pharmacy and Therapeutics
Karen Pater	CDE	Diabetes Educator	Pharmacy and Therapeutics
	BCACP	Ambulatory Care Pharmacy	
Brian Potoski	BCPS (AQ-ID)	Pharmacotherapy/Added Qualification in Infectious Diseases	Pharmacy and Therapeutics
Jennifer Pruskowski	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
	BCGP	Geriatric Pharmacist	
	CPE	Pain Educator	
Christine Ruby-Scelsi	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
	BCGP	Geriatric Pharmacist	
Amy Seybert	CHSE	Healthcare Simulation Educator	Pharmacy and Therapeutics
Pamela Smithburger	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
	BCCCP	Critical Care	
James Stevenson	BCPP	Psychiatry	Pharmacy and Therapeutics
Lauren Trilli Carradine	BCPS	Pharmacotherapy	Pharmacy and Therapeutics
Gordon Vanscoy	CACP	Anticoagulation Care Provider	Pharmacy and Therapeutics

Alumni and Alumni Engagement

The School of Pharmacy ranked second in the University in overall alumni engagement for FY19. Twenty-five percent of the 5,627 School of Pharmacy living alumni were engaged with the School of Pharmacy and/or University in some way. Additionally, the School ranked sixth in overall participation out of all 20 schools and campuses for the University of Pittsburgh's second annual Day of Giving. Three hundred and two donors contributed over \$42,000.

In FY19, alumni demonstrated their commitment to the University and the School in many ways, including participation in events sponsored by the School and/or the Alumni Society:

- Pharmacy alumni celebrated Homecoming 2018 with a tailgate-style homecoming party held at the Wyndham University Inn. One hundred and thirty-three alumni were in attendance.
- PittPharmacy hosted a Pharmacy Innovation Experience Research (PIER) Program reception in Miami, Florida on August 3, 2018 with forty individuals in attendance.

The School of Pharmacy also hosted:

- The Twenty Sixth Annual Career Roundtables on October 24, 2018 in the O'Hara Student Center Ballroom. Twenty-seven alumni participated in this student event. Alumni from twenty practice areas met with the P1 students and answered questions about their individual

practice areas giving the students a better perspective of the many opportunities a degree in pharmacy can offer.

- The Third Annual Student Industry Symposium the weekend of February 15, 2019 at the Hilton Garden Inn. This event welcomed 13 alumni from all corners of the country to discuss the inner-workings of the pharmaceutical industry with graduate and PharmD students. The event began with a welcome reception on Friday, February 15th and culminated in a day-long meeting on Saturday, February 16th, where leading industry professionals gave informative, TED-style talks, participated in roundtable discussions, and interacted with students.
- PittPharmacy Zoo Day was held on Saturday, June 2, 2019 where alumni and friends made their way to the Pittsburgh Zoo and PPG Aquarium for a day of family fun.

ENHANCING OUR RESOURCE BASE THROUGH EFFICIENCY AND EFFECTIVENESS

Fostering philanthropic support, assuring the efficient utilization of space, acquiring space for new and/or growing programs, managing fiscal resources, and providing the faculty and students with the best teaching technologies are critical to our future success. All are core elements that drive our efficiency and effectiveness goals.

Staff

In FY19:

- Ninety-eight staff members served in:
 - administrative roles (31)
 - research roles (67)
- The PittPharmacy staff is extraordinary and has remarkable commitments to excellence and innovation, to supporting research and scholarship, and to service in local and national organizations.
- Several administrative staff members serve as leaders on committees and councils external to the School of Pharmacy, including within the University.
- A PittPharmacy staff member was elected to the PPA Board of Directors
- Staff were part of a team that traveled to Scotland to present a poster at the 2018 International Pharmaceutical Federation World Congress of Pharmacy and Pharmaceutical Sciences.
- Seven PittPharmacy staff members received service awards from the School of Pharmacy for their tenure and commitment to the School.

Information Technology

In FY19, the Information Technology staff:

- Handled 1,553 Technology Help Tickets
 - Building and room access: 87
 - Classroom and speaker support: 68
 - Communications, graphics, and photography: 83
 - Database issues: 7

- Email and calendar: 99
- Equipment reservation: 20
- Hardware: 168
- iPad: 1
- Network/connectivity: 153
- New hardware request: 39
- Other: 118
- Software: 98
- Website: 387
- Work Specs: 1
- Uncategorized: 224

Communications

The School of Pharmacy advanced its use of electronic communication for sharing awards, accomplishments and activities with constituents. The School is active in social media and has a presence on Twitter, Facebook, YouTube, and LinkedIn. The Web is the primary gate keeper by which varied constituents learn about the School of Pharmacy. In FY19, the School of Pharmacy website, www.pharmacy.pitt.edu, generated:

- 75,204 visitors
 - 84.4% of the site visitors were from the United States
 - 43% of those were from within the state of Pennsylvania
- 388,901 pageviews

In FY19, the Communications Team:

- Produced and mailed six major print communications to the School of Pharmacy’s 6,132 stakeholders. Another 12 print pieces were produced and mailed in a more limited distribution. The Communications Team is moving from printed pieces to electronic items as main and more frequent resource of communication. Nine ePittPharmacy email blasts were sent out to faculty, staff, students, donors and friends of the School of Pharmacy.
- Developed electronic publications to enhance both efficiency and effectiveness. ePittPharmacy is the current news medium on the PittPharmacy website for the School. Faculty, student, and school awards, accomplishments, grants, and events are publicized weekly on the Web site.
- Throughout the year, sent ePittPharmacy email blasts to alumni and friends containing School of Pharmacy news and events. Also, area and client-specific email blasts were sent during the year e.g. CLIP workshops, MSPBA recruitment, PharmD recruitment. Our email list is comprised of 4,275 active recipients.
- Developed and produced a three-part series of videos for the purpose of recruiting PharmD students. Recent PharmD graduates were filmed on location and at the School of Pharmacy telling their story of “Why PittPharmacy?” Two of the three stories were completed and posted to the School’s website.
- Created and produced a Comprehensive Medication Management (CMM) video for the University of Pittsburgh Human Resources Department that highlights a new health care

benefit for employees. The video was distributed throughout the University and can be seen on monitors in campus several buildings.

Embrace the World





Embrace the World

The University of Pittsburgh Board of Trustees formally adopted the “Statement of Aspiration and Strategic Priorities” on February 28, 2014. Abstracted from the document is the statement that “Our overarching goal to be among the best in all that we do. . . . In the pursuit of that perpetual goal, the University’s work in the years ahead will be centered on efforts to: . . . Extend Our Global Reach.”

In 2012, the University of Pittsburgh articulated its vision for “Living Globally.”

By 2020, the University of Pittsburgh will be a community of faculty, students, and staff “Living Globally.” The Living Globally commitment will influence all aspects of our research, teaching, and service missions and will serve to enhance the University’s reputation as a leader in global education. We will:

- **Pursue research and scholarship that increase global understanding.**
- **Develop our students into global citizens and leaders.**
- **Improve people’s lives by studying and solving the world’s most critical problems.**

The faculty and staff of the School of Pharmacy embraced the University’s goals and vision in order to provide diverse learning opportunities for our students and to advance research and patient care through meaningful collaborations with international partners whose strengths and interests complement our own.

EMBRACE THE WORLD BY THE NUMBERS FOR FY19

During FY19:

- The School of Pharmacy engaged in partnerships with **19** international organizations on **5** continents, including Africa, Asia, Australia, North America, and Europe. The agreements include:
 - **13** Memoranda of Understanding for inter-institutional exchange of faculty and students
 - **6** Affiliation Agreements for the purposes of student and resident rotations
 - **42** international visiting scholars studied at the School of Pharmacy.
- **25** P4 PharmD students participated in rotations in **9** different countries.
- **8 P1, P2, and P3** students and **2 residents** also completed international rotations.

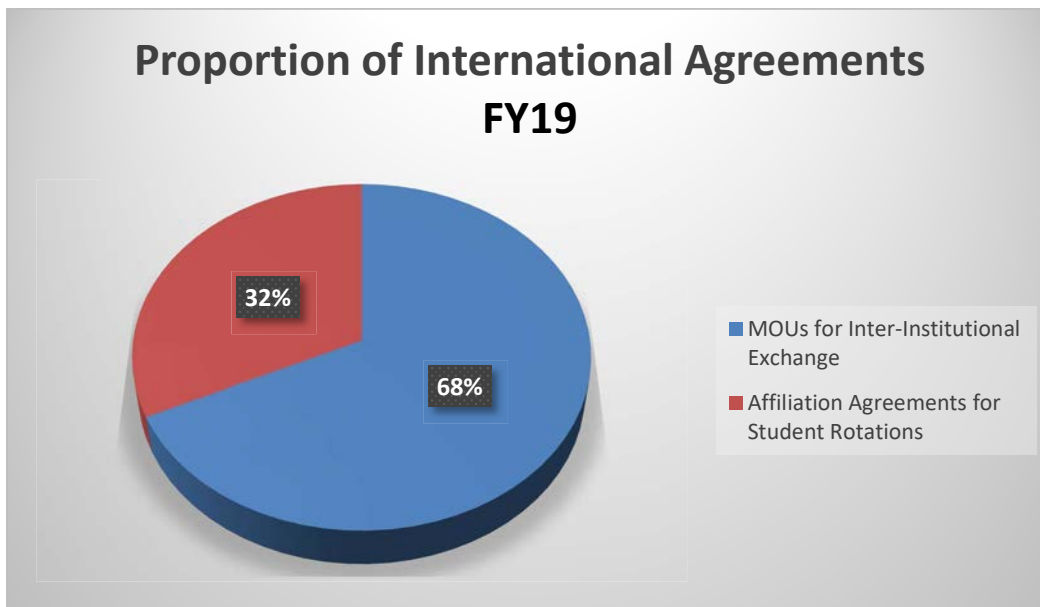
GLOBAL AND INTERNATIONAL PARTNERSHIPS

Partnerships

As part of the relationship-building process, the School of Pharmacy signs agreements with institutions to declare our intentions to explore possibilities for collaboration and to formalize our partnership. These agreements include:

- Memoranda of Understanding (MOU), which are broad-based expressions of interest in exploring opportunities for student and faculty exchange, research collaboration, and program development.
- Affiliation Agreements that provide structured expectations of both entities for international rotations for PharmD students and residents.
- Research Agreements between specific faculty or students and international organizations for the purposes of research collaboration.

The graph below illustrates the proportion of each agreement type. The table provides a comprehensive list of organizations with which we have active signed agreements.



FY19: Agreements with International Organizations

Institution	Location
Australia	
Sir Charles Hospital (Nedlands)	Nedlands, Australia
Canada	
Memorial University of Newfoundland	Newfoundland, Canada
China	
Shanghai Changhai Hospital	Shanghai, China
Fudan University	Shanghai, China
Peking University People's Hospital	Beijing, China
Second Military Medical University	Shanghai, China
Sun Yat-Sen University	Guangzhou, China
State Key Laboratory of Phytochemistry and Plant Resources	Kunming, China
West China School of Pharmacy of Sichuan University	Sichuan Sheng, China

Institution	Location
West China Hospital of Sichuan University	Chengdu City, China
Botanical University of Yunnan	Yunnan Province, China
England	
King's College	London, England
Honduras	
Hombro a Hombro Pittsburgh-San Jose	San Jose de Negrito, Yoro District, Honduras
Ireland	
Haven Pharmacy Farmers	Dublin, Ireland
Italy	
Universita degli Studi di Palermo/ UPMC ISMETT, (translated as Mediterranean Institute for Transplantation and High Specialization Therapies)	Palermo, Italy
Malawi	
Baobab Health Trust/Dai yang Luke Hospital	Malawi
Namibia	
Windhoek Central Hospital – University of Namibia	Windhoek, Namibia
Philippines	
Philippine General Hospital	Manila, Philippines
Switzerland	
Vivaleas SA Campus Biotech	Geneva, Switzerland

Summer Visiting Research Program

Initiated in summer 2014 and led by Professor Wen Xie, the School of Pharmacy designed a summer research program in partnership with the Sun Yat-Sen University School of Pharmaceutical Science in Guangzhou, China. The admissions committee, composed of faculty from both universities, selected six competitive third year bachelor's students from Sun Yat-Sen University to participate as summer research interns at the University of Pittsburgh during July 2014, who were chaperoned by faculty advisors from Sun Yat-Sen University. In FY15 and FY16, the program continued, and five competitive bachelor's students were chosen to participate in each year. In FY17, the summer program admitted eight bachelor's students due to the popularity of the program among the Sun Yat-Sen University students and enthusiasm of our School of Pharmacy faculty. In FY16 and FY17, in addition to students from Sun Yat-Sen University, the Summer Visiting Research Program also included two undergraduate students each year from the University of Puerto Rico, who were supervised by Dr. Christian Fernandez. In FY18, the summer program admitted seven bachelor's students from Sun Yat-Sen University. In FY19, the summer

program admitted eight bachelor's students from Sun Yat-Sen University.

The goal of the program is to attract academically qualified and scientifically prepared MS and PhD students from top tier schools of pharmacy. The summer internship offers potential students an opportunity to learn more about our graduate program, our faculty, the University of Pittsburgh, and living in Pittsburgh. The internship also provides an opportunity for our faculty to evaluate participants and the match of their research interests to individual laboratories.

Students must apply to our graduate program using the regular application process and must meet all requirements for graduate study at the University of Pittsburgh. Students have the option of choosing the two-year thesis-based master's program, the one-year non-thesis master's program, or the PhD program. Students admitted to the MS programs must be self-supported.

One of the six students from the FY14 group (Xinran Cai) enrolled in the one-year non-thesis master's program for Fall 2015 and works under the supervision of Dr. Wen Xie. The same student was admitted to our PhD program for Fall 2016 and works under the supervision of Dr. Wen Xie. One of the five students from the FY15 group (Xin Tong) enrolled in the two-year thesis master's program for Fall 2016 and works under the supervision of Dr. Lisa Rohan. The same student was admitted to our PhD program for Fall 2018 and works under the supervision of Dr. Lisa Rohan. One of the five students from the FY16 group (Zhangyi Luo) enrolled in the two-year thesis master's program for Fall 2017 and works under the supervision of Dr. Song Li. The same student was admitted to our PhD program for Fall 2019 and works under the supervision of Dr. Song Li. One of the five students from the FY17 group (Ziqian Zhang) enrolled in the two-year thesis master's program for Fall 2018 and works under the supervision of Dr. Song Li. One SYU student (Zhongfang Zhang) enrolled in the two-year thesis master's program for Fall 2019 and works under the supervision of Dr. Song Li.

PharmD Student International Learning and Experiences

Interest in international pharmacy experiences remains strong among our PharmD students. Students seek a wide range of opportunities and their goals are diverse, including passion for serving communities, inquisitiveness to learn about health care in other nations through both research, practice, and teaching strategies, and an adventurous spirit to become well-rounded and engaged global citizens.

In FY19, a total of 33 PharmD students were the direct beneficiaries of the growing number of international partnerships.

- 25 PharmD students completed P4 APPE rotations across 9 countries. Eight P1, P2, and P3 students completed international experiences including:
 - Three students participated in the IPSF Student Exchange Program traveling to Costa Rica, Singapore and Japan and Pitt Pharmacy hosted one student from Portugal.
 - One P3 student traveled to Namibia in July 2018 and two students (a P1 and a P2) traveled to Namibia in March 2019 as part of the International Pharmacy Practice Experiences elective course.
 - Two students participated in the UIP Summer Camp at Sichuan University in Chengdu, China.

University of Namibia: A Global Health Experience

For the fourth consecutive year, 3 students (1 P1, 1 P2, and 1 P3) as well as one pharmacy resident traveled to Namibia for a training experience to build relationships with the University of Namibia. Before leaving, students participated in a rigorous preparatory course designed to ensure that students were well aware of the key principles in global health, determinants of health, historical context for care in Namibia, and tuberculosis. During the course of their one to two-week experience, students partnered

with recent graduate pharmacist interns at Windhoek Central Hospital shadowing in a variety of pharmacy settings. They also met with and observed practice in community pharmacies, private hospitals, and the University. This experience will continue to be offered twice annually for PharmD students at Pitt. This year also included Lauren Jonkman, PharmD completing her Fulbright Scholar year building clinical pharmacy practice with the University of Namibia.

Global Health Area of Concentration

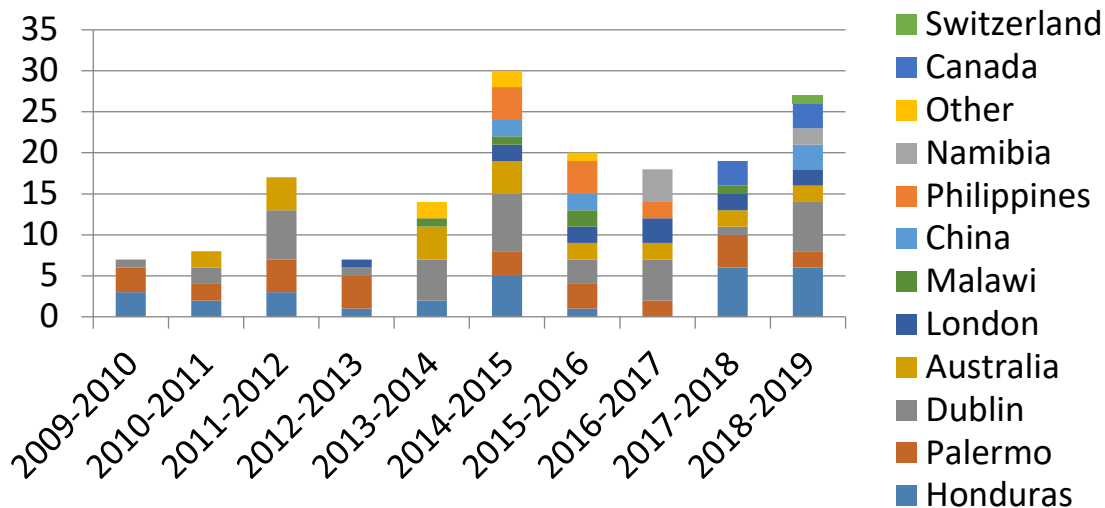
In FY19, a total of 38 students were enrolled in the Global Health Area of Concentration (GH-ARCO). The co-directors of the GH-ARCO are Sharon Connor, PharmD and Lauren Jonkman, PharmD, MPH. Eleven students in the class of 2019 graduated, each having participated in at least two global health APPE rotations and each having completed a mentored independent research project. There are 12 students in the class of 2020, 8 in the class of 2021 and 7 in the class of 2022.

International Advanced Pharmacy Practice Experiences (APPEs)

In FY19, 25 different P4 students completed international advanced pharmacy practice rotations:

- Sir Charles Gairdner Hospital in Australia (2 students: Angela Li, Andrea Bejjani)
- ISMETT in Palermo, Italy (2 students: Miranda Steinkopf, Carly Gabriel)
- Haven’s Pharmacy in Dublin, Ireland (6 students: Madeline Kreider, Paul Stangl, Joanna DeAngelis, Chenling Ni, Angela Sutt, Luke Jennings).
- King’s College in London, England (2 students: Jacob Boice, Michael Pinto)
- Memorial University of Newfoundland in Canada (3 students: Alex Snyder, Huiling Zhang, Richard Dong)
- Shoulder to Shoulder in San Jose, Honduras (6 students: Eryn Gordon, Niha Idrees, Michelle Miller, Miranda Steinkopf, Kathryn Muzzio, Martha Ndungu)
- Windhoek Central Hospital in Namibia (2 students: Rachel Young, Alex Snyder)
- Shanghai Changhai Hospital in China (3 students: Amanda Li, Kimberly Lui, Esther Tse)
- Vivaleas SA in Switzerland (1 student: Sam Bott)

Number of Students Completing P4 International APPEs



Global Health Residency and Rotations

The University of Pittsburgh School of Pharmacy is one of only two PGY2 residency programs in the country to offer pharmacist training to practice in the specialty area of global health. This program has now transitioned to be a track within the UPMC PGY2 Ambulatory Care Residency Program. The track coordinators of the PGY2 global health residency are Sharon Connor, PharmD and Lauren Jonkman, PharmD, MPH.

As part of the global health residency experience, the resident practices in limited-resource settings in Pittsburgh; in addition, he or she had a minimum of one international global health experience. In Pittsburgh, the resident conducted a qualitative evaluation of the needs of underserved patients in transitions of care through the Community Challenge Grant funded Pennsylvania Department of Health.

Four pharmacy residents from three programs, including the global health resident, completed global health rotations:

- Shoulder to Shoulder Pittsburgh-San José, San José del Negrito, Honduras
- University of Namibia School of Pharmacy, Windhoek, Namibia

International Visiting Scholars

In total, the School of Pharmacy hosted 42 international visiting scholars at differing levels of training during FY19. The visiting scholars are listed in the table below.

FY19 Visiting Scholars

Name	Home Institution	Hosted By
Yan Chen, MD, PhD	Zhejiang University of Technology	Dr. Xiang-Qun Xie's Lab
Jin Cheng	Nanjing University of Chinese Medicine	Dr. Xiang-Qun Xie's Lab
Dingwei Dao	Nanfeng Hospital, Southern Medical University	Dr. Song Li's Lab
Xuan Deng	Fudan University, Huashan Hospital	Dr. Da Yang's Lab
Mayuri Dutta	Guru Gobind Singh Indraprastha University (GGSIPU)	Dr. Shilpa Sant's Lab
Benjamin Edwards	Memorial University	Dr. Sharon Connor's Rotation
Betul Er	Yuditepe University	Dr. Christian Fernandez's Lab
Zihui Fang, MS	South China Agricultural University	Dr. Wen Xie's Lab
Ye Feng, MD	The First Affiliated Hospital of Zhejiang University	Dr. Wen Xie's Lab
Yubin Ge	University of Pittsburgh	Dr. Junmei Wang's Group
Angus Gibson	Memorial University	Dr. Sharon Connor's Rotation
Qi Guo	Sun Yat-sen University	Dr. Da Yang's Lab
Yingjie Guo	Jilin University	Dr. Wen Xie's Lab
Lin Huang, PhD	Peking University People's Hospital	Dr. James Stevenson's Lab
Dan Jia	Second Military Medical University	Dr. Lisa Rohan's Lab
Yifei Jian	Sun Yat-sen University	Dr. Xiaochao Ma's Lab
Mikko Karpale	University of Oulu	Dr. Wen Xie's Lab

Bin Li, MD	Zhongnan Hospital of Wuhan University	Dr. Wen Xie's Lab
Haosheng Li	Sun Yat-sen University	Dr. Lisa Rohan's Lab
Jianhua Li	The First Affiliated Hospital of Zhengzhou University	Dr. Xiaochao Ma's Lab
Xizhen Li	Sun Yat-sen University	Dr. Song Li's Lab
ShengZhen Liu, MD	Chinese PLA General Hospital	Dr. Song Li's Lab
Yangwuyue Liu, BS	Third Military Medical University	Dr. Song Li's Lab
Weina Ma, PhD	Xi'an Jiaotong University	Dr. Song Li's Lab
Shweta Niak	University of Pittsburgh	Dr. Raman Venkataramanan's Lab
Jagannath Panda, PhD	Nanyang Environment and Water Institute	Dr. Donna Huryn's Lab
Guolian Ren	Shanxi Medical University	Dr. Song Li's Lab
Pengfei Ren	Nanfang Hospital	Dr. Song Li's Lab
Zitong Shao	Sun Yat-sen University	Dr. Lisa Rohan's Lab
Jing Tian, MS	Second Military Medical University	Dr. Song Li's Lab
Xin Tian	The 1 st Affiliated Hospital of Zhengzhou University	Dr. Xiaochao Ma's Lab
Yuanqiang Wang	Chongqing University of Technology	Dr. Xiang-Qun Xie's Lab
Junkang Wei	Sun Yat-sen University	Dr. Wen Xie's Lab
Xuemei Wu, PhD	Fujian Medical University Union Hospital	Dr. Raman Venkataramanan's Lab
Zhiyuan Wu	Fudan University, ,Huashan Hospital	Dr. Da Yang's Lab
Zhiyuan Wu, BS, MMed	Shanghai Medical College, Fudan University	Dr. Da Yang's Lab
Yue Xi	Sun Yat-sen University	Dr. Wen Xie's Lab
Jiyuan Xing	The 1 st Affiliated Hospital of Zhengzhou University	Dr. Xiaochao Ma's Lab
Dongliang Xu	Sun Yat-sen University	Dr. Wen Xie's Lab
Shunqing Xu	Yancheng Institute of Technology	Dr. Xian-Qun Xie's Lab
Chengyu Ye	China Pharmaceutical University	Dr. Wen Xie's
An Zhou	Anhui University of Chinese Medicine	Dr. Raman Venkataramanan's Lab

Promote Diversity and Inclusion



Promote Diversity and Inclusion

Vision

The Diversity and Inclusion Committee aims to create and sustain a school culture that understands that diversity, equity, and inclusion are essential to the mission of the School of Pharmacy

Diversity and Inclusion Committee Members

Christian Fernandez (Chair)	Zhiwei Fen
Lorin Grieve (Vice-Chair)	Marcia Borrelli
Sharon Connor	Sherri Peterson
Sharon Corey	Karen Wagner
Jim Stevenson	Tom Waters
Inmaculada Hernandez	Sam Poloyac
Maggie Folan	Shilpa Sant

Recruiting Diversity Initiatives

The Pharmacy Innovation Experience and Research (PIER) Program

Purpose

The Program focuses on the recruitment of minority students from the University of Pittsburgh community or from communities with high minority populations, such as the Miami, FL area, in order to engage high-achieving minority students in Pharmacy and in PittPharmacy. The innovative remote program can recruit students of various demographics outside of Pittsburgh by identifying partners that can host students throughout the 5-week experience.

Program goals and objectives

Specific goals for PIER were developed based on previous literature, known factors that influence career choice of pharmacy, and the feedback of several college/high school student focus groups. PIER's objectives include:

- increasing pharmacy awareness;
- providing participants pharmacy mentors;
- creating interest in Pitt Pharmacy, and
- identifying barriers to recruiting minorities to the profession and to PittPharmacy. Pre- and post-program surveys were used to assess whether PIER achieved said objectives.

PIER Components

Based on our literature review, known influential factors, and the feedback from our focus groups, we designed four main components to achieve our goals and objectives:

- Experiential site visits (community and hospital pharmacies) to learn about the role of a pharmacist and pharmacy technicians in health care.
- Online didactic lectures introducing weekly experiential site visits, general pharmacy topics that increase pharmacy awareness, and information regarding PittPharmacy.
- Mentor debriefing sessions to discuss site visits and the role of pharmacists in health care
- A pharmacy-related research project designed by PittPharmacy faculty identifying minority health disparities in the local community

PIER Miami and PIER Pitt

Initially, PIER programs were implemented during summer 2017 in Miami, FL and spring 2018 in Pittsburgh, PA. Overall, there have been five PIER sessions held since 2017: three in Miami, FL and two in Pittsburgh, PA. The success of the PIER program is monitored by:

- determining whether we successfully recruit minority students to PIER;
- determining whether we increased pharmacy awareness among participants;
- determining whether PIER participants applied to pharmacy programs; and
- determining whether PIER participants applied to the University of Pittsburgh

Summary of ongoing PIER program outcomes for FY19:

- Our PIER recruiting efforts continue to demonstrate strong potential for recruiting minorities, where PIER Miami recruited 77% percent minority students and PIER Pitt recruited 14% minorities. Overall, PIER Miami has recruited 36 students, of which 26 are considered underrepresented minorities (i.e., 72%), including 17 Hispanic and 9 Black participants, whereas the PIER Pitt program has enrolled a total of 52 University of Pittsburgh undergraduates.
- For FY19, PIER Miami participants overwhelmingly agreed that the program increased their pharmacy awareness (9.5 average score out of a 10-point scale based on survey data). Overall, 2017 and 2018 PIER participants indicate that the program is achieving its programmatic goal of increasing pharmacy awareness (9.5 average out of 10).
- For FY19, four PIER Miami participants were eligible for applying to pharmacy programs. Of these, all applied to pharmacy programs, were accepted, and have enrolled in a pharmacy program. Overall, 6 PIER Miami program alumni have become eligible for applying to pharmacy and 100% have pursued and enrolled in a pharmacy program.
- For FY19, of the four 2018 PIER Miami participants who applied to pharmacy programs, one applied to Pitt Pharmacy (25%) and was accepted; however, the student decided to pursue pharmacy training elsewhere. While data analysis is ongoing, a major barrier to enrolling minority students to Pitt Pharmacy seems to be a lack of scholarship support. Overall for the 2017 and 2018 PIER Miami programs, we have had 50% of PIER participants (i.e., 3 of 6) apply to Pitt Pharmacy, demonstrating that the PIER program is effective for increasing interest in Pitt Pharmacy among underrepresented minorities. Since the inception of PIER in 2017, there has been a 43% increase in applications from Florida Hispanic students relative to FY2014-2016.

Taken together, the PIER Program is achieving its objectives and has proved to increase the application pool of minority students at the University of Pittsburgh.

Monitoring School Culture and Climate Initiatives

Based on the 2018 School of Pharmacy Diversity and Inclusion Retreat, the Diversity and Inclusion Committee for FY19 focused on three aims identified by attendee feedback:

- providing underrepresented minority students with a voice,
- monitoring School climate, and
- improving diversity representation in the PharmD curriculum cases

Aim 1: Providing underrepresented minority students a voice.

- The 2017-18 PharmD orientation was modified to include several sessions related to Diversity and Inclusion topics (e.g., microaggressions)
- A Diversity Mixer event was organized on October 3rd, 2018 to give our students an opportunity to meet other underrepresented minorities across other Health Sciences programs

- Guidelines for improving the diversity of invited PittPharmacy seminar speakers are under development
- Future Pharmacy Diversity Retreats and diversity-related seminars are under development

Aim 2: Monitoring School climate

Student focus group discussions were conducted by the Diversity and Inclusion Committee with the following student groups to understand their perceived School climate and to identify future Committee initiatives to improve our students' experiences:

- School of Pharmacy underrepresented minority PharmD students
- LGBTQ students
- School of Pharmacy Graduate students
- Students with disabilities (anticipated for FY20)

Aim 3: improving diversity representation in the PharmD curriculum cases

- The Committee analyzed and identified a lack of diversity in the PharmD curriculum and Pharmacotherapy Casebook
- Guidelines are under preparation to facilitate creating diverse patient cases in the curriculum
- The Diversity and Inclusion committee, based on feedback during the 2018 Diversity Retreat, led an initiative to modify existing School of Pharmacy Professional Attire Guidelines to be more inclusive. A taskforce, including Diversity and Inclusion Committee members, was created by PittPharmacy, and changes to the guidelines were implemented in August 2019

Education Appendix



Education Appendix

THE PHARMD PROGRAM

As a recognized national leader in pharmacy education, the School of Pharmacy offers world-class learning opportunities for students. The School of Pharmacy:

- contributes to the national dialogue about the scholarship of teaching, learning, and assessment through publications and presentations;
- provides students with a rich array of opportunities to personalize their education, including areas of concentration; elective courses; independent study; research engagement; experiential rotations; travel to state, regional, and national meetings; and international pharmacy travel;
- empowers students to become practitioners with the necessary skills and knowledge to be leaders in patient-centered care and key contributors on the health care team; and
- provides student pharmacists and graduate pharmacists with support and resources through a lifetime of professional development.

THE PHARMD PROGRAM

- A. Adopting the philosophy of “cost of PharmD education” vs. the credit-based tuition. Students are permitted to take courses above a standard credit limit and during the summer with no additional tuition.
- B. “Personalizing education.” See next major section.
- C. Accelerating learning through active engagement.
 1. Facilities enhance active engagement. The Novo Nordisk Learning Center, which opened in fall 2013, is a state-of-the-art classroom that facilitates active and small-group learning in a large group setting. A second technology-enhanced, flexible space teaching space was opened in FY17.
 2. Setting expectations and assessing performance. The FY15 implementation of a blended-simulation, readiness assessment sets student expectations and assesses student progress and readiness for Advanced Pharmacy Practice Experiences. P1 and P3 students plus PGY1 residents participate. Foundational knowledge, clinical decision making, patient communication skills, interprofessional communication skills, and attitudes of ownership for patient outcomes are all assessed in the performance-based assessment.

PittPharmacy’s readiness assessment received the national Excellence in Assessment Award in FY17 from the American Association of Colleges of Pharmacy. This assessment is now part of PittPharmacy's comprehensive assessment program. Data are used to inform student-specific education plans, as well as improvements to the curriculum to accelerate student development.
- D. Developing, implementing, and increasing the number of learning situations that engage students in simulated environments and with simulated patients and health care providers to accelerate the

development of clinical decision-making, patient education, and interprofessional communication skills.

1. Standardized patients
2. Standardized colleagues
3. Virtual patient simulation
4. Human patient simulators
5. Voice-oriented interprofessional communication
6. Educational games

Simulated patient experiences have tremendous value for learning because each of the above:

- Provides immediate feedback to the student on performance.
- Protects patients from medication errors or students practicing first-time communication skills.
- Provides a known safe environment for student learning.

1. Standardized Patients. Students gain skills in patient interviewing, clinical reasoning, and therapeutic decision making through a variety of simulated patient care experiences that are woven throughout the curriculum. Actors trained as standardized patients provide students opportunities to practice patient care in a safe environment and to receive detailed feedback from faculty focused on continued development and refinement of skills.

2. Standardized Colleagues. Faculty and residents trained as standardized physicians and other health professionals provide student opportunities to practice communication skills to effectively engage in collaborative team-based care delivery and navigate potentially difficult conversations. All P1 students also participate in the fall Interprofessional Forum to learn alongside first-year students in other health sciences programs on campus about the emerging importance of interprofessional collaborative care in the current era of health care reform.

3. Virtual Patient Simulation. PittPharmacy faculty members are nationally recognized for their development and use of computer-based, virtual patients to integrate case-based teaching of complex therapeutic concepts and clinical decision-making processes into the curriculum. Their award-winning work with a branched-outcome decision-making model is based on game theory. These cases have enhanced clinical decision making in the therapeutics component of the curriculum.

4. Human Patient Simulators. The Peter M. Winter Institute for Simulation, Education and Research (WISER) Center remains a valuable resource for use in pharmacy courses. Equipped with 16 full-sized simulators in a bank of simulated environments, control centers, and debriefing rooms, the WISER center is staffed with full-time technicians and serves students across the health sciences as well as practitioners across the UPMC system. In addition, the School has invested in a full-time director of simulation, two simulation mannequins, four arms to train in blood pressure monitoring, and a wound care foot that are housed in Salk Hall for students' use to improve their clinical skills.

5. Voice-Oriented Interprofessional Communication Evaluation System (VOICES). VOICES is a teaching strategy that incorporates telephone communication into the didactic and experiential learning curriculum. Using Google Voice (Google, Mountain View, CA), faculty have implemented learning activities to facilitate student development of skills needed for effective telephonic communication with patients and other health care professionals.

6. Educational Games. RxPedition is a semester-long course structured as a competitive game in which students learn the drug development process. Organized into 20 “companies,” students explore how drugs come to market and the drivers that influence drug discovery and development, participate in the design and evaluation of a simulated drug study according to FDA critically about the science, methods, and regulations that allow a product to reach the market with the expectation of safe and effective use by patients.

- E. Optimizing the use of required Introductory Pharmacy Practice Experiences (IPPEs) and Advanced Pharmacy Practice Experiences (APPEs), which require interactions with patients and other health care providers.

INDICATORS of EXCELLENCE

CURRICULAR IMPROVEMENT AND OVERSIGHT

The School has become nationally recognized for its assessment approaches and commitment to a culture of assessment. School faculty members received the Award for Excellence in Assessment from the American Association of Colleges of Pharmacy in 2012 and again in 2017. In addition, three projects were selected over two years (2013 and 2014) for presentation at the annual Assessment Institute, the nation’s oldest and largest event focused exclusively on outcomes assessment in higher education. The School’s Curriculum Assessment Committee is responsible for monitoring the effectiveness of the PharmD curriculum and the achievement of student learning outcomes.

Student Presentations at National and Regional Meetings

American Society of Health-System Pharmacists Midyear Clinical Meeting	
Primary Author	Poster Title
Jessica Cercone (P3)	Assessment of the impact of pharmacists' interventions in an advanced heart failure discharge clinic
Kara DeGrave (P3)	Implementation of a pharmacist-delivered patient education program on pharmacogenomics in cardiac medication selection
Ravi Desai (P3)	Understanding the unforeseen consequences of FDA drug safety communications
Kiana Green (P3)	Negative health behaviors contribute to the development of opioid use disorder
Melanie Hawn (P3)	Medication utilization evaluation of intravenous dextrose at an academic medical center
Jessica Hu (P3)	A novel risk-based approach to personalizing patient education following pharmacogenomic testing
Steven Moretti (P3) Madeline Kreider (P4)	Towards improving education for patients receiving pharmacogenomic results following cardiac catheterization
Caylee Sams (P3)	Evaluation of statin prescribing in patients with cardiovascular disease and/or diabetes in a primary care clinic with an embedded clinical pharmacy specialist
Lauren Albert (P4) Liam Callejas (P4) Connor Jan (P4) Rose Zhang (P4)	Medication management after acute kidney stress identified by a TIMP2-IGFBP7 value

American Society of Health-System Pharmacists Midyear Clinical Meeting	
Primary Author	Poster Title
Lauren Albert (P4) Andrea Bejjani (P4)	Effectiveness of direct oral anticoagulants for the treatment of venous thromboembolism in obesity
Simona Avramovska (P4)	Evaluation of induction and neuromuscular blocking agents use and adverse drug reactions during rapid sequence intubation by physicians
Simona Avramovska (P4) Kara Ioannou (P4) Shrey Parekh (P4) Marissa Waterloo (P4)	Evaluation of bleeding associated with genotype-guided antiplatelet therapy versus usual care for patients undergoing percutaneous coronary intervention
Olivia Berger (P4) Kristel Chatellier (P4) Adam Greenfield (P4) Jessica Marini (P4)	Effectiveness of genotype-guided antiplatelet therapy versus treatment-as-usual for patients undergoing percutaneous coronary intervention
Jenna Borowski (P4) Richard Jones (P4)	Pharmacy Investing as a tool for understanding healthcare trends
Rachel Cartus (P4) Layne Reihart (P4)	Effect of clopidogrel and proton pump inhibitor drug-drug interaction on bleeding events in CYP2C19-genotyped patients who underwent percutaneous coronary intervention
Jessica Chmielinski (P4) Mikhaila Rice (P4)	Effect of concomitant administration of clopidogrel and proton pump inhibitors on bleeding in CYP2C19-genotyped patients who underwent percutaneous coronary intervention
Amanda Colangelo (P4)	Impact of a novel poverty simulation board game on student pharmacists' attitudes toward poverty
Casey Dubrawka (P4) Luke Jennings (P4) Ashley Kamp (P4) Neha Poladi (P4)	Impact of pharmacogenetics on the possible drug interaction between clopidogrel and proton pump inhibitors
Abigail Elmes (P4)	Factors for enrollment in the work-based Master of Pharmacy (clinical) at the University of Namibia School of Pharmacy
Adam Greenfield (P4)	Predictors of delirium in lightly sedated mechanically ventilated patients
Niha Idrees (P4) Miranda Steinkopf (P4)	Health care providers' perceptions of an electronic inventory prescription management and inventory control system in rural Honduras
Ashley Kamp (P4) Layne Reihart (P4)	Evaluating the necessity of central venous catheter placement for patients requiring vasopressor infusions
Madeline Kreider (P4)	Does CYP2C19 genotype predict selective serotonin reuptake inhibitor maintenance dose? A prescriber-blinded pilot investigation
Amanda Li (P4)	Effects of Layered Learning Practice Model on a pharmacy team in an urban free clinic
Angela Li (P4)	Drug-associated delirium identified in the Food and Drug Administration Adverse Event Reporting System (FAERS)
Ann McAndrew (P4) Esther Tse (P4)	Evaluation of appropriateness of sacubitril/valsartan use at an academic medical center
Michelle Miller (P4)	Evaluation of appropriateness of tacrolimus dosing and incidence of rejection among kidney transplant recipients at UPMC Presbyterian Hospital
Kathryn Muzzio (P4)	Impact of an international medical service trip on attitudes toward interprofessional collaboration

Alyssa Pagliaro (P4)	Clinical evaluation of carbapenem resistant Enterobacteriaceae (CRE) infections in a community teaching hospital
Jordan Serio (P4)	Home deliriogenic medication effect on delirium development in a medical intensive care unit
Seth Stahl (P4)	Evaluating a dexmedetomidine stewardship initiative in a large academic medical center
Miranda Steinkopf (P4)	Walking tours as an education tool for pharmacy students
Angela Sutt (P4)	Evaluation of rabbit antithymocyte globulin dosing and incidence of rejection in simultaneous liver-kidney transplant recipients
American Pharmacists Association Annual Meeting	
Primary Author	Poster Title
Catherine Pfendner (P3) Jinli Zhao (P3) *K. Doong *M. McGivney *J. Carroll	Evaluating Interprofessional Collaboration Within a Community Pharmacy Enhanced Service Network
Divya Patel (P3) *D. Boulton *M. Nagard *R. Bertz *AstraZeneca (D. Boulton, M. Nagard)	Comprehensive Review of Gastric Acid Modifying Agent-Medicated Drug-Drug Interactions with Orally Administered Medications
*A. Lapping *L. Berenbrok	Successful Implementation Strategies for Community- Based National Diabetes Prevention Programs (NDPP) in Pennsylvania
Victoria Blake (P3) Jenny Li (P3) *J. Carroll *M. McGivney *K. Coley	Discovering Pharmacist Preferences for Engagement in a Statewide Community Pharmacy Practice-Based Research Network
Carson Shoemaker (P3) Jordan Serio (P4) Mikhaila Rice (P4) Alyssa Pagliaro (P4) *C. McHugh *P. Smithburger	Antipsychotic Medication Use in the Medical Intensive Care Unit and the Effects on Time Spent Delirious
Kiana Green (P3) Casey Butrus (P3) Jared Ickes (P3)	Negative Health Behaviors Contribute to the Development of Opioid Use Disorder
Jennifer Jordan (P3) Danielle Snyder (P3) *T. Mancuso *L. Berenbrok	Understanding Employee Preferences for an Employer-Sponsored Comprehensive Medication Management Benefit
Christine Barthen (P3) Rachel Writer (P3) *Brandon Antinopoulos *R. Uber *J. Stevenson *L. Berenbrok *P. Verona	An Implementation Plan for Integrating Pharmacogenomic Data at a Regional Supermarket Community Pharmacy
Jeong Heo (P3) Kara DeGrave (P3) *J. Coons	Implementation of a Pharmacist-Delivered Patient Education Program on Pharmacogenomics in Cardiac Medication Selection

Dhanuvarshini Prakasam (P3) *A. Wong *S. Kane-Gill	Benefit of Patient/Caregiver Reporting Compared to Other Sources of Reporting in the Inpatient Setting: A Systematic Review
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* Denotes Non-Student Contributors

Pennsylvania Pharmacists Association Mid-Year Conference	
Primary Author	Poster Title
Christine Barthen (P3)	An Implementation Plan for Integrating Pharmacogenomic Data at a Regional Supermarket Community Pharmacy
Eric Schneider (P3)	Pharmacist Led Direct Oral Anticoagulant Eligibility in Chronic Warfarin Users
Victoria Blake (P3)	Discovering Pharmacist Preferences for Engagement in a Statewide Community Pharmacy Practice-Based Research Network
Catherine Pfindner (P3)	Evaluating Interprofessional Collaboration Within a Community Pharmacy Enhanced Services Network (CPESN)
Tristan Thompson (P3)	Report on Project in Progress: Impact of Pharmacy-Driven Transitions of Care Calls on Discovery and Correction of Medication Discrepancies Post-Discharge
Danielle Snyder (P3)	Understanding Employee Preferences for an Employer-Sponsored Comprehensive Medication Management Benefit
Jenna Ingram (P3)	Pharmacists Preceptors' and Pharmacy Students' Perceptions of Poison Prevention Week Patient Education Materials

Recognition and Awards: Individual Students

Student	Award
Grace Erdman (P2) Mara Cubellis (P2) Hailey Mook (P2)	2019 National Consumers League (NCL) Script Your Future Medication Adherence Challenge
Marissa Badzik (P4) Kaitlyn Burkett (P3) Lindsay Jablonski (P4) Julie Mandel (P4) Justin Saver (P4)	American Pharmacists Association – Academy of Student Pharmacists Patient Care Achievement Award
Joshua Cinicola (P1)	American Foundation for Pharmaceutical Education (AFPE) Gateway to Research Award.
Kathy Monangai (P3) Hager Mohamedein (P2)	SNPhA 2019 Cultural Program of the Year Award for Black History Cultural Showcase – University of Pittsburgh Blue Stars Red Carpet Award
Sejla Jukic (P2)	Top Finalist in National Patient Counseling Competition - APhA
Kaitlyn Rudzik (P3) Hailey Fribance (P2)	APhA Medicine Safety National Award – 1 st runner up and Generation Rx Regional Award
Mohamed Kashkoush (P2) Diana Mansour (P3) Julia Heo (P3)	Published to the online journal and resource – "ID Stewardship: Promoting Clinical Pharmacy and Antimicrobial Stewardship."
Joseph Rizkalla (P2)	Kappa Psi Foundation Scholarship

Divya Patel (P3)	Published in the Journal of Clinical Therapeutics - Pittsburgh Schweitzer Fellow Program
Xinyan Ye (P4) Abigail Kois (P3)	Government Relations and Advocacy Award - Pennsylvania Pharmacists Association
Katie Van Golen (P3) Alyssa Lear (P3) Julianne Slomer (P3) Spencer Schlecht (P3)	Pennsylvania Pharmacists Association 2018 Achieving Independence Competition Award
Kristel Chatellier (P4) Kara Ioannou (P4) Diana Mansour (P3) Amanda Schwenk (P4)	American Society of Consultant Pharmacists – Top poster award at the ASCP National Conference Pharmacists Association
Seana Armstrong (P2) Vincent Piro (P2) Melanie Umbaugh (P2)	Panther's Forward Program Scholarship Recipients
Victoria Blake (P3)	Pennsylvania Pharmacists Association Educational Foundation- Student Member
Jessica Mattox (P2) Melanie Umbaugh (P2)	Kroger/Student National Pharmaceutical Association Clinical Skills Competition
Julia Heo (P3) Varsh Prakasam (P3)	American Society of Health System Pharmacists New Drug Update Competition Award
Mikhaila Rice (P4)	American College of Clinical Pharmacy National Student Network Advisory Committee
Kathy Monangai (P3)	Student National Pharmaceutical Association 2018 National Elections Committee- Region 1 Representative
Madison McConnell (P3)	2019 Walmart Scholars Recipient
Sophia Cothrel (P4)	Pennsylvania Pharmacists Association Educational Foundation Board Member
Julia Heo (P3) Varsh Prakasam (P3)	American Society of Hospital Pharmacists – New Drug Update Competition winners
Divya Patel (P3)	Presented at the FDA – Research on Gastric – Acid Modifying agent Mediated DDI's

Student Awards at Graduation

Student Awardee	Award Title
Robert Aikman and Simona Avramovska	Robert W. Taylor Award for Outstanding Performance in Patient Care Rotation
Ashley Blazewick	Pennsylvania Pharmacists Association Outstanding Pharmacy Student Award
Jamie Cekada and Marissa Waterloo	John Herman Wurdack Award
Rami El Chammas	The Dr. Gordon J. Vanscoy Business of Medicines Award
Amanda Colangelo	University of Pittsburgh, School of Pharmacy Excellence in Self-Care Award
Sophia Cothrel	University of Pittsburgh, School of Pharmacy Excellence in Self-Care Award
Jessica Chmielinski	The Pennsylvania Society of Health-Systems Pharmacists Award – The Daniel J. Cobaugh Award
Kelsey Hake	University of Pittsburgh, School of Pharmacy, Innovations in Community Practice Award

Katherine Halza and Mikhaila Rice	Merck Award
Sarah Hunt	Academy of Students of Pharmacy Senior Recognition Award
Anish Patel	University of Pittsburgh, School of Pharmacy Excellence in Research Award
Jordan Serio	Mylan Pharmaceutical Excellence in Pharmacy Award
Miranda Steinkopf	US Public Health Service–Excellence in Public Health Pharmacy Practice Award
Xinyan Ye	Lilly Achievement Award

RESIDENCY PROGRAM: EDUCATING THE NEXT GENERATION OF PRACTITIONERS

Residents 2018-2019

Last Name	First Name	Pitt Residency Program	Year	PharmD School	Plans for FY19
Aurora, Jr.	John	Ambulatory Care UPMC Presbyterian	PGY2	The University of Connecticut	Clinical Pharmacy Specialist in Endocrinology, Tufts Medical Center, Boston, MA
Nystrom	Hannah	Ambulatory Care UPMC Presbyterian	PGY2	Ohio Northern University	Ambulatory Care Clinical Pharmacist, St. Elizabeth's Physicians, Erlanger, KY
Pham	Theo	Ambulatory Care Global Health Tracks UPMC Presbyterian	PGY2	University of Washington	Summit/Ambulatory Intensive Care Unit (AICU) Clinical Pharmacist, Central City Concern - Old Town Clinic, Portland, OR
Ferdock	Ariel	Ambulatory Care UPMC St. Margaret's	PGY2	Nova Southeastern University	Hospital and Ambulatory Pharmacist, Mayo Clinic Health System, Sparta, WI
Kirpekar	Pooja	Ambulatory Care UPMC St. Margaret's	PGY2	Virginia Commonwealth University	Ambulatory Care Clinical Pharmacist, Penn Presbyterian Medical Center, Philadelphia, PA
Weinstein	Sara	Ambulatory Care UPMC St. Margaret's	PGY2	University of Arizona	Ambulatory Care Clinical Assistant Professor, Ernest Mario School of Pharmacy of Rutgers, Piscataway, NJ
Moreland	Lindsay	Cardiology UPMC Presbyterian	PGY2	Purdue University	Clinical Pharmacist with the Mechanical Circulatory Device Support Team, Mayo Clinic, Rochester, MN

Last Name	First Name	Pitt Residency Program	Year	PharmD School	Plans for FY19
Phi	Catherine	Community Asti's Pharmacy	PGY1	Massachusetts College of Pharmacy and Health Sciences	Pharmacist, Asti's South Hills Pharmacy, Pittsburgh, PA
Lapping	Amber	Community Giant Eagle Pharmacy	PGY1	University of Pittsburgh	Floater Pharmacist, Giant Eagle Pharmacy, Pittsburgh, PA
Mitra	Sneha	Community Rite Aid Pharmacy	PGY1	Duquesne University	Clinical Community Pharmacist, Rite Aid Corporation, Pittsburgh, PA
McHugh	Caitlin	Critical Care UPMC Presbyterian	PGY2	Duquesne University	Emergency Department Clinical Pharmacy Specialist, Allegheny General Hospital, Pittsburgh, PA
Bobrzynski	Emily	Geriatrics UPMC St Margaret's	PGY2	University of Pittsburgh	Inpatient Heart Failure Clinical Pharmacy Specialist, Allegheny Health Network/Forbes Hospital, Pittsburgh, PA
Wilson	Erica	Geriatrics UPMC St Margaret's	PGY2	University of Pittsburgh	Assistant Professor, Long Island University Arnold and Marie Schwartz College of Pharmacy, Brooklyn, NY
Asamoah	Benedicta	Health System Pharmacy Administration and Leadership UPMC Presbyterian	PGY1-2	University of Maryland	Safe Medication Management Fellow, Institute for Safe Medication Practices, Horsham, PA
Fawzy	John	Health System Pharmacy Administration and Leadership UPMC Presbyterian	PGY1-2	Long Island University - Arnold and Marie Schwartz College of Pharmacy	PGY2 Health System Pharmacy Administration and Leadership, UPMC Presbyterian, Pittsburgh, PA
Hoffman	Tyler	Health System Pharmacy Administration and Leadership UPMC Presbyterian	PGY1-2	University of Pittsburgh	Pharmacy Administration Fellow UPMC Presbyterian, Pittsburgh, PA
Hylwa	Keith	Health System Pharmacy Administration and Leadership	PGY1-2	Albany College of Pharmacy and Health Sciences	PGY2 Health System Pharmacy Administration and Leadership, UPMC Presbyterian, Pittsburgh, PA

Last Name	First Name	Pitt Residency Program	Year	PharmD School	Plans for FY19
		UPMC Presbyterian			
Hospodar	Alexa	Managed Care CVS Caremark	PGY1	University of Pittsburgh	Clinical Professional in Oncology Specialty Product Development, CVS Health, Pittsburgh, PA
Patel	Nishta	Managed Care CVS Caremark	PGY1	University of California - San Francisco	Clinical Professional in Specialty Product Development, CVS Health, Phoenix, AZ
Bastacky	Melissa	Oncology UPMC Shadyside	PGY2	University of Pittsburgh	Clinical Oncology Pharmacist, UPMC Shadyside Hospital, Pittsburgh, PA
Sparks	Meredith	Pharmacy UPMC Children's Hospital	PGY1	University of Pittsburgh	Pharmacist, Atrium Health/Levine Cancer Institute, Charlotte, NC
Korlinchak	Ariel	Pharmacy UPMC Hamot	PGY1	Lake Erie College of Osteopathic Medicine	Emergency Medicine Clinical Pharmacist, UPMC Hamot, Erie, PA
Martin	Meghan	Pharmacy UPMC Hamot	PGY1	Lake Erie College of Osteopathic Medicine	Acute Care Clinical Pharmacist Geisinger Holy Spirit Hospital, Camp Hill, PA
Zdaniewski	Christine	Pharmacy UPMC Hamot	PGY1	Duquesne University	Clinical Pharmacist, UPMC Hamot, Erie, PA
Bevan	Jennifer	Pharmacy UPMC Magee Womens Hospital	PGY1	The Ohio State University	Clinical Pharmacist, The Ohio State University Wexner Medical Center, Columbus, OH
Dadey	Liam	Pharmacy UPMC McKeesport	PGY1	University of Pittsburgh	Clinical Generalist Pharmacist, Parkview Regional Medical Center, Fort Wayne, IN
Bever	Andrew	Pharmacy UPMC Mercy	PGY1	Duquesne University	Lead Pharmacist, UPMC Mercy, Pittsburgh, PA
Caldwell, Jr.	Terrence	Pharmacy UPMC Mercy	PGY1	University of the Sciences in Philadelphia	Clinical Pharmacist, Children's Hospital of Philadelphia, Philadelphia, PA
Gray	Victoria	Pharmacy UPMC Mercy	PGY1	The Ohio State University	Staff Pharmacist, UPMC Mercy, Pittsburgh, PA
Hassen	Hayat	Pharmacy UPMC Mercy	PGY1	University of Missouri - Kansas City	PGY2 Ambulatory Care, Hennepin County Medical Center, Minneapolis, MN
Meyer	Abby	Pharmacy UPMC Mercy	PGY1	University of Pittsburgh	PGY2 Critical Care, UPMC Presbyterian, Pittsburgh, PA

Last Name	First Name	Pitt Residency Program	Year	PharmD School	Plans for FY19
Colvin	Bailey	Pharmacy UPMC Presbyterian	PGY1	University of the Sciences in Philadelphia	PGY2 Cardiology, UPMC Presbyterian, Pittsburgh, PA
Fredrick	Stacy	Pharmacy UPMC Presbyterian	PGY1	University at Buffalo	PGY2 Solid Organ Transplant, UPMC Presbyterian, Pittsburgh, PA
Landolf	Kaitlin	Pharmacy UPMC Presbyterian	PGY1	University at Buffalo	PGY2 Critical Care, University of Maryland Medical Center, Baltimore, MD
Sheridan	Erica	Pharmacy UPMC Presbyterian	PGY1	The University of Toledo	PGY2 Cardiology, University of Kentucky Medical Center, Lexington, KY
Spitznogle	Sarah	Pharmacy UPMC Presbyterian	PGY1	University at Buffalo	PGY2 Infectious Diseases, University of Texas MD Anderson Cancer Center, Houston, TX
Kim	Didi	Pharmacy UPMC Shadyside	PGY1	University of Maryland	Clinical Pharmacist, UPMC Shadyside Hospital, Pittsburgh, PA
Schoenle	Marilyn	Pharmacy UPMC Shadyside	PGY1	Butler University	PGY2 Ambulatory Care Family Medicine Track, UPMC Presbyterian, Pittsburgh, PA
Cardinal	Rachael	Pharmacy UPMC St. Margaret	PGY1	University at Buffalo	PGY2 Ambulatory Care, UPMC St. Margaret, Pittsburgh, PA
Panjwani	Sehrish	Pharmacy UPMC St. Margaret	PGY1	Texas Tech University Health Sciences Center	PGY2 Geriatrics, UPMC St. Margaret, Pittsburgh, PA
Raghavan	Archana	Pharmacy UPMC St. Margaret	PGY1	Virginia Commonwealth University	PGY2 Geriatrics, UPMC St. Margaret, Pittsburgh, PA
Williams	Anne	Pharmacy UPMC St. Margaret	PGY1	University of Maryland	PGY2 Ambulatory Care, UPMC St. Margaret, Pittsburgh, PA
Wissman	Kevin	Pharmacy UPMC St. Margaret	PGY1	University of Kansas	PGY2 Ambulatory Care Family Medicine, UPMC St. Margaret, Pittsburgh, PA
Goulding	Hannah	Pharmacy UPMC Western Psychiatric Hospital	PGY1	University of North Carolina	Clinical Pharmacist, UPMC Western Psychiatric Hospital, Pittsburgh, PA
Yabs	Melanie	Pharmacy UPMC Western Psychiatric Hospital	PGY1	The University of Texas at Austin	PGY2 Psychiatry, UPMC Western Psychiatric Hospital, Pittsburgh, PA
Dean	Taylor	Psychiatric Pharmacy UPMC Western Psychiatric Hospital	PGY2	The University of Texas at Austin	Clinical Psychiatric Pharmacist, The University of Kansas Health System, Kansas City, KS

2019-2020 Residents

Program Type	Location	Resident	Education
PGY1 Community Pharmacy – University of Pittsburgh	Asti's Pharmacy	Evan Turco	West Virginia University
	Giant Eagle	Carly Gabriel	University of Pittsburgh
	Rite Aid	Kelsey Hake	University of Pittsburgh
PGY1 Health System Pharmacy Administration and Leadership	UPMC Presbyterian	Madison Postlewaite	West Virginia University
		Lauren Ray	West Virginia University
PGY1 Managed Care	CVS Caremark	Carley Mingone	University of Pittsburgh
		Kevin Niehoff	The University of Iowa
	UPMC Health Plan	Taylor Akers	Duquesne University
PGY1 Pharmacy	UPMC Children's Hospital	Meghan Gill	Virginal Commonwealth University
	UPMC Hamot	Molly Bacon	South Carolina College of Pharmacy
		Richard Jones	University of Pittsburgh
		Joseph Welch	Lake Erie College of Osteopathic Medicine
	UPMC Magee Womens Hospital	Jennifer Fay	Lake Erie College of Osteopathic Medicine
	UPMC McKeesport	Katherine Halza	University of Pittsburgh
	UPMC Mercy	Alexander Cain	St. John Fisher Wegmans School of Pharmacy
		Liam Callejas	University of Pittsburgh
		Sydney Hand	Duquesne University
		Ann McAndrew	University of Pittsburgh
		Emily Spencer	The Ohio State University
	UPMC Presbyterian	Julie DiBridge	University of Pittsburgh
		Jacob Gregory	West Virginia University
		Aaron Hutchins	West Virginia University
		Marissa Levito	Massachusetts College of Pharmacy and Health Science
		Katharine Woodworth	University of North Carolina
	UPMC Shadyside	Lindsay Courtney	University of Colorado
		Dodi Zenilman	University of Maryland
	UPMC St. Margaret	Kristel Chatellier	University of Pittsburgh
		Samantha DeMarco	Virginia Commonwealth University
		Amisha Mehta	Ernest Mario School of Pharmacy at Rutgers
		Nolan Schmitz	University of Kansas
		Cassidy Williams	Xavier University of Louisiana College of Pharmacy
	UPMC Western Psychiatric Hospital	Rena Sackett	Loma Linda University
		Andrea Temelie	University of Minnesota
	PGY2 Ambulatory Care	UPMC Presbyterian	Precious Dadzie
Kayla Davis			Albany College of Pharmacy and Health Sciences

	UPMC St. Margaret	Jennifer Ko	University at Buffalo
		Marilyn Schoenle	Butler University
		Rachael Cardinal	University at Buffalo
		Anne Williams	University of Maryland
		Kevin Wissman	University of Kansas
PGY2 Cardiology	UPMC Presbyterian	Bailey Colvin	University of the Sciences in Philadelphia
PGY2 Critical Care	UPMC Presbyterian	Abby Meyer	University of Pittsburgh
PGY2 Geriatrics	UPMC St. Margaret	Sehrish Panjwani	Texas Tech University Health Sciences Center
		Archana Raghavan	Virginia Commonwealth University
PGY2 Health System Pharmacy Administration and Leadership	UPMC Presbyterian	John Fawzy	Long Island University - Arnold and Marie Schwartz College of Pharmacy
		Keith Hylwa	Albany College of Pharmacy and Health Sciences
PGY2 Oncology	UPMC Shadyside	Kristian Casem	Rutgers Ernest Mario School of Pharmacy
PGY2 Psychiatric	UPMC Western Psychiatric Hospital	Melanie Yabs	University of Texas at Austin
PGY2 Solid Organ Transplant	UPMC Presbyterian	Stacy Fredrick	University at Buffalo

2018-2019 Pharmaceutical Sciences Graduate Students

Name	Advisor	Track	Enrollment	Degree
Al Busaysi, Salwa	Fabian, Tanya	Pharmaceutics	11-Jan	PhD
Alvarez, Celeste	Wipf, Peter	Medicinal Chemistry	11-Aug	PhD
Bian, Yuemin	Xie, Xiang-Qun	Medicinal Chemistry	15-Aug	MS
Birabaharan, Jonathan	Poloyac, Samuel	Pharmaceutics	18-Aug	PhD
Cai, Xinran	Xie, Wen	Pharmacology	15-Aug	PhD
Chaphekar, Nupur	Venkataramanan, Raman	Pharmaceutics	17-Aug	MS
Chen, Jing	Ma, Xiaochao	Pharmacology	17-Aug	MS
Chen, Yuang	Li, Song	Pharmaceutics	18-Aug	MS
Cheng, Haizi	Xie, Xiang-Qun	Medicinal Chemistry	13-Jan	PhD
Chheda, Urmi	Sant, Shilpa	Pharmaceutics	17-Aug	MS
Chiang, Yun-Shan	Rohan, Lisa	Pharmaceutics	18-Aug	MS
Crisamore, Karryn	Empey, Phil	CPS*	17-Aug	PhD
Deppas, Joshua	Beumer, Jan	CPS*	18-Aug	MS
Desai, Stuti	Rohan, Lisa	Pharmaceutics	17-Aug	MS
Durairajan, Prithvirajan	Rohan, Lisa	Pharmaceutics	16-Aug	PhD
Eichinger, Katherine	Empey, Kerry	CPS*	11-Aug	PhD
Fan, Peihao	Wang, LiRong	Medicinal Chemistry	17-Aug	MS
Fancher, Ashley	Xie, Xiang-Qun	Medicinal Chemistry	13-Aug	PhD

Name	Advisor	Track	Enrollment	Degree
Feturi, Firuz	Venkataramanan, Raman	Pharmaceutics	11-Aug	PhD
Franchetti, Yoko	Nolin, Tom	CPS*	15-Aug	PhD
Gray, Matthew	Kane-Gill, Sandy	POPR†	18-Aug	PhD
Hogle, Brett	Folan, Maggie	NTMS	16-Aug	NTMS
Hu, Ziheng	Xie, Xiang-Qun	Medicinal Chemistry	13-Aug	PhD
Huang, Haozhe	Li, Song	Pharmaceutics	18-Aug	PhD
Jhunjhunwala, Kunal	Rohan, Lisa	Pharmaceutics	13-Aug	PhD
Ji, Beihong	Wang, LiRong	Medicinal Chemistry	17-Aug	MS
Jing, Yankang	Xie, Xiang-Qun	Medicinal Chemistry	16-Aug	PhD
Kelkar, Rachana	Wipf, Peter	Medicinal Chemistry	17-Aug	MS
Kiesel, Brian	Beumer, Jan	Pharmaceutics	14-Aug	PhD
Kirshner, Ziv	Gibbs, Bob	Pharmacology	11-Aug	PhD
Kochanek, Stanton	Johnston, Paul	Pharmacology	13-Aug	PhD
Li, Jing	Rohan, Lisa	Pharmaceutics	13-Aug	PhD
Li, Junyi	Gibbs, Robert	Pharmacology	12-Aug	PhD
Li, Lingjue	Poloyac, Samuel	CPS*	13-Aug	PhD
Li, Sihan	Yang, Da	Pharmacology	17-Aug	MS
Liu, Shuhan	Wang, Junmei	PSP‡	18-Aug	MS
Long, Keith	Hurny, Donna	Medicinal Chemistry	17-Aug	PhD
Long, Tao	Yao, Jeffrey	Pharmacology	11-Aug	PhD
Luo, Zhangyi	Li, Song	Pharmaceutics	17-Aug	MS
Ma, Shifan	Xie, Xiang-Qun	Medicinal Chemistry	13-Aug	PhD
Moharil Pearl	Li, Song	Pharmaceutics	17-Aug	MS
Naik, Shweta	Sant, Vinayak	Pharmaceutics	17-Aug	MS
Niznik, Joshua	Thorpe, Carolyn	POPR†	15-Aug	PhD
Pakalapati, Naren	Venkataramanan, Raman	Pharmaceutics	18-Aug	MS
Patel, Akhil	Sant, Shilpa	Pharmaceutics	13-Aug	PhD
Prokopienko, Alexander	Nolin, Thomas	CPS*	14-Aug	PhD
Qi, Xiguang	Wang, Lirong	PSP‡	18-Aug	MS
Rao, Di	Gibbs, Bob	Pharmacology	17-Aug	MS
Sakharkar, Mrunal	Sant, Vinayak	Pharmaceutics	17-Aug	MS
Schleiden, Loren	Thorpe, Carolyn	POPR†	17-Aug	PhD
Shah, Tanvi	Rohan, Lisa	Pharmaceutics	17-Aug	MS
Shehu, Amina	Ma, Xiaochao	Pharmacology	13-Aug	PhD
Shen, Mingzhe	Bertz, Richard	PSP‡	18-Aug	MS
Silva Barbosa, Anne	Wen, Xie	Pharmacology	15-Aug	PhD
Springer, Sydney	Thorpe, Carolyn	POPR†	17-Aug	PhD

Name	Advisor	Track	Enrollment	Degree
Tang, Chenxiao	Poloyac, Sam	CPS*	14-Aug	PhD
Thanukrishnan, Harisudhan	Venkataramanan, Raman	CPS*	12-Aug	PhD
Tong, Xin	Rohan, Lisa	Pharmaceutics	16-Aug	MS
Tung, Hung-Chun	Xie, Wen	Pharmacology	16-Aug	PhD
Vasudevan, Aishwarya	Sant, Vinayak	Pharmaceutics	18-Aug	MS
Vaughn, Zoe	Hurn, Donna	Medicinal Chemistry	18-Aug	PhD
Wan, Zhuoya	Li, Song	Pharmaceutics	16-Aug	PhD
Wang, Jingyuan	Xie, Wen	Pharmacology	18-Aug	PhD
Wang, Siyi	Feng, Zhiwei	PSP [‡]	18-Aug	MS
Wang, Yifie	Yang, Da	Pharmacology	18-Aug	MS
Wang, Yue	Yang, Da	Pharmacology	16-Aug	PhD
Wu Nan	Xie, Xiang-Qun	Medicinal Chemistry	17-Aug	MS
Xie, Yang	Xie, Wen	Pharmacology	14-Aug	PhD
Xing, Changrui	Xie, Xiang-Qun	Medicinal Chemistry	14-Aug	PhD
Xu, Jieni	Li, Song	Pharmaceutics	13-Aug	PhD
Xu, Rongkun	Rohan, Lisa	Pharmaceutics	17-Aug	MS
Xu, Ruichao	Venkataramanan, Raman	Pharmaceutics	14-Aug	PhD
Xu, Yuanyuan	Xie, Xiang-Qun	PSP [‡]	18-Aug	MS
Zhan, Yunpeng	McDermott, Lee	Medicinal Chemistry	17-Aug	MS
Zhang, Hongfei	Venkataramanan, Raman	CPS*	13-Aug	PhD
Zhang, Ziqian	Li, Song	Pharmaceutics	18-Aug	MS
Zheng, Ruohui	Rohan, Lisa	Pharmaceutics	17-Aug	PhD
Zhou, Xiang	Yao, Jeffrey	Pharmacology	13-Aug	PhD

*CPS – Clinical Pharmaceutical Scientist Program

†POPR - Pharmaceutical Outcomes and Policy Research Track

‡PSP – Pharmacometrics and Systems Pharmacology

Students Selected for the Pharmaceutical Sciences PhD and Research-based MS Graduate Program, Beginning in Fall 2019

Name	Track	Degree
Alabdali, Rana	Pharmacology	PhD
Casal, Morgan	CPS*	PhD
Chaphekar, Nupur	Pharmaceutics	PhD
Chen, Xinyun	Pharmacology	MS
Cuyler, Jacob	Medicinal Chemistry	PhD

Name	Track	Degree
Dodeja, Prerna	Pharmaceutics	MS
Fan, Peihao	PSP [‡]	PhD
Guo, Xiaojiang	PSP [‡]	MS
Hoshitsuki, Keito	CPS*	PhD
Hou, Tianling	Pharmaceutics	PhD
Ji, Beihong	PSP [‡]	PhD
Kreider, Madeline	CPS*	PhD
Li, Huatian	Pharmaceutics	MS
Li, Sihan	Pharmacology	PhD
Li, Yujia	POPR [†]	MS
Liang, Tianjian	PSP [‡]	MS
Lipp, Madeline	CPS*	PhD
Luo, Zhangyi	Pharmaceutics	PhD
Nmmas, Mohammed	Pharmaceutics	PhD
Pardeshi, Apurva	Pharmaceutics	MS
Wang, Xiaofei	Pharmacology	MS
Xu, Kexin	Medicinal Chemistry	MS
Yang, Lanting	POPR [†]	PhD
Young, Gregory	Pharmacology	PhD
Zhai, Jingchen	PSP [‡]	MS
Zhang, Bei	Pharmaceutics	MS
Zhang, Yuzhao	PSP [‡]	MS
Zhang, Zhongfang	Pharmaceutics	MS

*Clinical Pharmaceutical Scientist Program and Pharmaceutics Track

†Pharmaceutical Outcomes and Policy Research Track

‡PSP – Pharmacometrics and Systems Pharmacology

STUDENTS COMPLETING GRADUATE DEGREES IN 2018-2019

Master of Science Graduates

Non-Thesis MS Graduates

Shweta Naik, MS

Advisor: Vinayak Sant, PhD

Graduation: April 2019

Thesis MS Graduates

Nupur Chaphekar, MS

Advisor: Raman Venkataramanan, PhD

Graduation: April 2019 (Defense completed April 2019)

Thesis Title: Preliminary Safety Evaluation of 17-Hydroxyprogesterone Caproate (17-OHPC) Intravaginal Gel in Pregnant Rats

Jing Chen, MS

Advisor: Xiaochao Ma

Graduation: April 2019 (Defense completed April 2019)

Thesis Title: Role of Cytochrome P450s in Isoniazid Bioactivation

Urmi Chheda, MS

Advisor: Shilpa Sant, PhD

Graduation: April 2019 (Defense completed April 2019)

Thesis Title: Analysis of Gene Signatures of Migratory Phenotypes Using Three-Dimensional Breast Microtumor Models

Stuti Desai, MS

Advisor: Lisa Rohan

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Development of Biorelevant In Vitro Release Testing Methods for Periodontal Microparticles

Ameya Deshpande, MS

Advisor: Lee McDermott, PhD

Graduation: August 2018 (Defense completed July 2018)

Thesis Title: Synthesis and Evaluation of Novel 20-HETE formation inhibitors

Peihao Fan, MS

Advisor: Junmei Wang

Graduation: April 2019 (Defense completed April 2019)

Thesis Title: Identification of Novel Targets for Psychosis in AD with Real World Evidence and Network Analysis Approaches

Beihong Ji, MS

Advisor: Junmei Wang

Graduation: April 2019 (Defense completed April 2019)

Thesis Title: Pharmacokinetics Modeling and Molecular Modeling of Drug-Drug Interactions Between Opioids and Benzodiazepines

Rachana S. Kelkar, MS

Advisor: Peter Wipf, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Effect of Temperature, Age and Lifespan Extending Interventions on Caenorhabditis Elegans Models of Amyloid Beta Pathology

Sihan Li, MS

Advisor: Da Yang, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Regulation of DNA Damage Response via Gene Copy Number Variations

Zhangyi Luo, MS

Advisor: Song Li, MD, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Co-delivery of 2-DG and V9302 via a Prodrug Micellar Formulation for Synergistic Targeting of Metabolism in Cancer

Pearl Moharil, MS

Advisor: Song Li

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Folic Acid Conjugated Polymer as a Nano-Carrier: Dual Targeting of Tumor Cells and Tumor Microenvironment

Di Rao, MS

Advisor: Robert Gibbs, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Effects of Chronic Restraint Stress on Aromatase, Estrogen Receptors, Inflammatory Markers and Local Estrogen Production in Brain

Mrunal K. Sakharkar, MS

Advisor: Vinayak Sant, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Development of Micro-Patterned Films for Ophthalmic Drug Delivery

Tanvi Shah, MS

Advisor: Lisa Rohan, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Stabilization of a Tenofovir Alafenamide Fumarate Formulation for Use in a Subcutaneous Implant

Sydney Springer, PharmD, MS

Advisor: Carolyn Thorpe, MPH, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Prevalence of Aspirin Receipt and Discontinuation Amongst Veterans Health Administration Community Living Center Residents with Indications for Secondary Prevention of Cardiovascular Events

Nan Wu, MS

Advisor: Xiang-Qun Xie, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: An Insight into an Autophagy Receptor P62 Oligomerization Through PB1 Domain Using Molecular Modeling

Yunpeng Zhan, MS

Advisor: Lee McDermott, PhD

Graduation: April 2019 (Defense completed April 2019)

Thesis Title: Synthesis and Evaluation of Halogenated 20-HETE Formation Inhibitors

PhD Graduates

Salwa Albusaysi, PhD

Advisor: Tanya Fabian, PharmD, PhD

Graduation: April 2019 (Defense completed January 2019)

Thesis Title: Major Depressive Disorder (MDD): Potential Predictors of Vulnerability and Treatment Response

Katherine Eichinger, PharmD, PhD

Advisor: Kerry Empey, PharmD, PhD

Graduation: April 2019 (Defense completed March 2019)

Thesis Title: Characterization and Immunomodulation of the Infant Immune Response to Respiratory Syncytial Virus

Ashley Fancher, PhD

Advisor: Paul Johnston, PhD

Graduation: August 2019 (Defense completed April 2019)

Thesis Title: Disrupting Androgen Receptor Transactivation Domains to Identify Lead Compounds with Potential to be Optimized and Developed into Prostate Cancer Therapeutics

Fanuel T. Hagos, PhD

Advisor: Philip Empey, PharmD, PhD

Graduation: August 2018 (Defense completed May 2018)

Thesis Title: The Role of Membrane Transporters in Traumatic Brain Injury: Interventional and Genetic Investigations

Sung Tae Kim, PhD

Advisor: Yon-Tae Kwon, PhD

Graduation: August 2018 (Defense completed July 2018)

Thesis Title: The Role of the N-End Rule Pathway in Mammalian Development and Innate Immunity

Stanton Kochanek, PhD

Advisor: Paul Johnston

Graduation: August 2019 (Defense completed July 2019)

Thesis Title: Data-Driven HTS Strategies for Selection of Drug Combinations and 3D Models for Physiologically Relevant Drug Discovery

Jing Li, PhD

Advisor: Lisa Rohan

Graduation: December 2018 (Defense completed October 2018)

Thesis Title: Leveraging Mucoadhesive Thiomers and PLA-Based Polymers to Design Biodegradable Extended Release Vaginal Films for HIV Prevention

Junyi Li, PhD

Advisor: Robert Gibbs, PhD

Graduation: December 2018 (Defense completed June 2018)

Thesis Title: Local Estrogen Production in The Brain and Its Regulation Under Pathological Conditions

Lingjue Li, PhD

Advisor: Samuel Poloyac, PharmD, PhD

Graduation: April 2019 (Defense completed April 2019)

Thesis Title: Alteration of Cerebral Blood Flow After Neurovascular Injury

Tao Long, PhD

Advisor: Robert Gibbs

Graduation: April 2019 (Defense completed February 2019)

Thesis Title: Metabolomics Analysis of Brain Monoamines, Metabolites and Amino Acids in Two Models of Menopause with/without Estrogen Receptor Agonist Treatments

Joshua D. Niznik, PharmD, PhD

Advisors: Carolyn Thorpe, MPH, PhD and Samuel Poloyac, PharmD, PhD.

Graduation: August 2019 (Defense completed May 2019)

Thesis Title: Deprescribing of Acetylcholinesterase Inhibitors in Older Adult Nursing Home Residents with Severe Dementia

Alexander Prokopienko, PharmD, PhD

Advisor: Thomas Nolin, PharmD, PhD

Graduation: August 2019 (Defense completed July 2019)

Thesis Title: Effect of Kidney Disease and Gut-Derived Uremic Toxins on Flavin Monooxygenases: Clinical and Translational Research Studies

Harisudhan Thanukrishnan, PhD

Advisor: Raman Venkataramanan, PhD

Graduation: August 2019 (Defense completed June 2019)

Thesis Title: Pharmacological Approaches to Preserve Renal Grafts and to Optimize Immunosuppression in Renal Transplantation

Jieni Xu, PhD

Advisor: Song Li, MD, PhD

Graduation: April 2019 (Defense completed February 2019)

Thesis Title: Multifunctional Nanocarriers for Combination Cancer Therapy

Yingfei Xue, PhD

Advisor: Shilpa Sant, PhD

Graduation: August 2018 (Defense completed July 2018)

Thesis Title: Micro/Nanotechnologies to Engineer Microenvironmental Cues for Regenerative Heart Valve Therapies

Hongfei Zhang, PhD

Advisor: Raman Venkataramanan, PhD

Graduation: August 2019 (Defense completed 2019)

Thesis Title: Optimization of Buprenorphine Dosing in Pregnant Women

Xiang Zhou, PhD

Advisor: Robert Gibbs

Graduation: December 2018 (Defense completed September 2018)

Thesis Title: Clinical Significance of Adenosine Signaling Deficits in Schizophrenia Pathology: From Theoretical Foundations to Symptomatology

AWARDS TO GRADUATE STUDENTS

Competitive Fellowships/Scholarships

- **Solomon Adams** was the recipient of a Clinical and Translational Science TL1 Postdoctoral Fellowship from the Institute for Clinical Research Education, University of Pittsburgh.
- **Karryn Crissamore** was awarded a 2018 AFPE Pre-Doctoral Fellowship in Pharmaceutical Sciences for her proposal “A Pharmacogenomic Approach to Explaining Pharmacokinetic Variability of Sedatives in the Pediatric Intensive Care Unit”.
- **Fanuel Hagos** was the recipient of a Clinical and Translational Science TL1 Predoctoral Fellowship from the Institute for Clinical Research Education, University of Pittsburgh.
- **Brian Kiesel** was awarded a 2018 AFPE Pre-Doctoral Fellowship in Pharmaceutical Sciences for his proposal “The Translational and Clinical Pharmacology of Chemoradiation Sensitizers”.
- **Brian Kiesel** was the recipient of a Clinical and Translational Science TL1 Postdoctoral Fellowship from the Institute for Clinical Research Education, University of Pittsburgh.
- **Joshua Niznik** was the recipient of a T-32 NIH Training Grant for Clinical Research in Geriatrics/Gerontology from the University of Pittsburgh Department of Medicine - Division of Geriatrics Medicine
- **Alexander Prokopienko** was the recipient of a Clinical and Translational Science TL1 Postdoctoral Fellowship from the Institute for Clinical Research Education, University of Pittsburgh.

Research or Presentation Awards

- **Anne Caroline Silva Barbosa’s** poster, “Requirement of Estrogen Sulfotransferase for the development of ischemic Acute Kidney Injury in Mice” was chosen for a Podium Presentation at the 2019 Annual Graduate Student and Post-Doctoral Research Retreat held at Seven Springs, PA.
- **Xinran Cai’s** poster, “Role of Tyrosylprotein Sulfotransferase 2 (TPST2) in Pancreatic Cancer” was chosen for the Pharmacology Track Podium Presentation at the 2019 Annual Graduate Student and Post-Doctoral Research Retreat held at Seven Springs, PA.
- **Alexander Prokopienko’s** poster, “Metabolic Activation of Flavin Monooxygenase-mediated Trimethylamine-N-oxide Formation” was chosen for the Clinical Pharmaceutical Sciences Track Podium Presentation at the 2019 Annual Graduate Student and Post-Doctoral Research Retreat held at Seven Springs, PA.
- **Chenxiao Tang’s** poster, “In silico, in vitro, and in vivo Evaluation of Novel 20-HETE Formation Inhibitors to Ameliorate Secondary Brain Injury After Cardiac Arrest” was chosen for a Podium Presentation at the 2019 Annual Graduate Student and Post-Doctoral Research Retreat held at Seven Springs, PA.
- **Ruohui Zheng’s** poster, “Cervical Tissue Explant Mode: Potential Application for Studying Drug Transport” was chosen for the Pharmaceutics Track Podium Presentation at the 2019 Annual Graduate Student and Post-Doctoral Research Retreat held at Seven Springs, PA.

- **Haizi Cheng** won the Young Investigator Award at The American Society for 2018 Bone and Mineral Research Annual Meeting in Montreal, Quebec, Canada for his presentation, “p18 is Required and Regulated by BMP4 in Muscle-Derived Stem Cell-mediated Osteogenesis and Bone Regeneration During Aging”.
- **Matthew Gray** won the 2019 Student Research Award from the American Society of Health System Pharmacists for his publication entitled “Outcomes of Patients With Atrial Fibrillation Newly Recommended for Oral Anticoagulation Under the 2014 American Heart Association/American College of Cardiology/Heart Rhythm Society Guideline”.
- **Joshua Niznik** won the Best Postdoctoral Clinical Research Award at the 2018 UPMC/Pitt Aging Institute Research Day for his poster entitled “Factors Associated with De-prescribing AChEIs in Older Nursing Home Residents with Severe Dementia”.
- **Akhil Patel** received a People’s Choice Award at the 2019 McGowan Institute Research Retreat for his poster entitled “RegenMatrix: A Growth Factor-free Bone Graft for Craniofacial Bone Regeneration”.
- **Akhil Patel** won a Runner Up Award at the Society for Biomaterials 2018 meeting for his poster entitled, “Growth Factor-free Bioactive Nanocomposite Promotes Bone Regeneration in vivo”.
- **Loren Schleiden** received an Honorable Mention (Clinical Sciences - Master's Level Students and Candidates for Doctoral Degrees) at the 2018 UPMC/Pitt Aging Institute Research Day for his poster, “Geographic Variation in Antidementia Medication Use Among Medicare Part D Beneficiaries with Alzheimer's Disease”.
- **Hongfei Zhang** won the Student Abstract Award at the 2018 meeting of the American College of Clinical Pharmacy for her abstract “Model-Based Analysis to Evaluate Alteration of Buprenorphine Pharmacokinetics During Pregnancy”.

Other Awards

- **Matthew Gray** won the Randy and Reneé Juhl Pharmacy Graduate Scholar Award for excellent academic achievement for the 2018-2019 academic year.
- **Yuemin Bian** won the Norman R. and Priscilla A. Farnsworth Student Research Award for the 2018-2019 Academic year.
- **Amina Shehu and Yang Xie** won the Pharmaceutical Sciences Graduate Student Excellent Award for the 2018-2019 academic year.
- **Yankang Jing** received the Teaching Assistant of the Year Awards for the 2018-2019 Academic term.

Travel Awards

- **Karryn Crisamore** received a Graduate Program Council travel award to attend the 2019 Clinical Pharmacogenetics Implementation Consortium Meeting in Nashville, TN for her poster “Evaluation of Whole Genome Sequencing for Pharmacogenomics Testing”

- **Kunal Jhunjunwala** received a Graduate Program Council travel award to attend the 2018 Annual Meeting of the American Association in Pharmaceutical Sciences in Washington, DC for his poster “Impact of Hydroxyl Value of Fatty Acid Based Suppository on Condom Compatibility”.
- **Zhuoya Wan** received a Graduate Program Council travel award to attend the 2019 American Chemical Society Fall National Meeting and Expo in San Diego, CA for her presentation “Dual Functional Immunostimulatory Polymeric Prodrug Carrier with Pendent Indoximod for Enhanced Cancer Imunochemotherapy”
- **Joshua Niznik** received a Graduate Program Council travel award to attend the 2018 Annual Research Meeting of The Academy Health Conference in Seattle WA for his presentation “Factors Predicting the Use of Anticholinergic Medications in Nursing Home Patients”.

Graduate Student Publications and Presentations

Publications

- **Kochanek SJ**, Close DA, Wang AX, Shun T, Empey PE, Eiseman JL, Johnston PA. Confirmation of selected synergistic cancer drug combinations identified in an HTS campaign and exploration of drug efflux transporter contributions to the mode of synergy. *SLAS Discov.* 2019 Jul;24(6):653-668.
- **Kochanek SJ**, Close DA, Johnston PA. High content screening characterization of head and neck squamous cell carcinoma multicellular tumor spheroid cultures generated in 384-well ultra-low attachment plates to screen for better cancer drug leads. *Assay Drug Dev Technol.* 2019 Jan;17(1):17-36.
- Close D1, Wang AX, **Kochanek SJ**, Shun T, Eiseman JL3, Johnston PA. Implementation of the NCI-60 human tumor cell line panel to screen 2260 cancer drug combinations to generate >3 million data points used to populate a large matrix of anti-neoplastic agent combinations (ALMANAC) Database. *SLAS Discov.* 2019 Mar;24(3):242-263.
- Man VH, He X, Derreumaux P, **Ji B**, Xie XQ, Nguyen PH, Wang I. Effects of all-atom molecular mechanics force fields on amyloid peptide assembly: the case of A β 16-22 dimer. *J Chem Theory Comput.* 2019 Feb 12;15(2):1440-1452.
- He X, Man VH, **Ji B**, Xie XQ, Wang J. Calculate protein-ligand binding affinities with the extended linear interaction energy method: application on the Cathepsin S set in the D3R Grand Challenge 3. *J Comput Aided Mol Des.* 2019 Jan;33(1):105-117.
- **Niznik J1**, He H, Kane-Gill SL. Impact of clinical pharmacist services delivered via telemedicine in the outpatient or ambulatory care setting: A systematic review. *Res Social Adm Pharm.* 2018 Aug;14(8):707-717.
- **Schleiden LJ1**, Thorpe CT, Cashy JP, Gellad WF, Good CB, Hanlon JT, Mor MK, **Niznik JD**, Pleis JR Van Houtven CH, Thorpe JM. Characteristics of dual drug benefit use among veterans with dementia enrolled in the Veterans Health Administration and Medicare Part D. *Res Social Adm Pharm.* 2019 Jun;15(6):701-709.

- **Jing Y, Bian Y, Hu Z**, Wang L, Xie XQ. Deep learning for drug design: An artificial intelligence paradigm for drug discovery in the Big Data era. *AAPS J*. 2018 Mar 30;20(3):58
- **Long T**, Yao JK, Li J, **Kirshner ZZ**, Nelson D, Dougherty GG, Gibbs RB. Comparison of transitional vs surgical menopause on monoamine and amino acid levels in the rat brain. *Mol Cell Endocrinol*. 2018 Nov 15;476:139-147.
- **Adams SM, Crisamore KR**, Empey PE. Clinical pharmacogenomics: Applications in nephrology. *Clin J Am Soc Nephrol*. 2018 Oct 8;13(10):1561-1571.
- **Zhang H1, Kalluri HV1**, Bastian JR, Chen H, **Alshabi A**, Caritis SN, Venkataramanan R. Gestational changes in buprenorphine exposure: A physiologically-based pharmacokinetic analysis. *Br J Clin Pharmacol*. 2018 Sep;84(9):2075-2087.
- Sun J, Sun L, Li J, Xu J, **Wan Z**, Ouyang Z, Liang L, Li S, Zeng D. A multi-functional polymeric carrier for simultaneous positron emission tomography imaging and combination therapy. *Acta Biomater*. 2018 Jul 15;75:312-322.
- Johnson C, **Prokopienko AJ**, West RE 3rd, Nolin TD, Stubbs JR. Decreased kidney function is associated with enhanced hepatic flavin monooxygenase activity and increased circulating Trimethylamine N-Oxide concentrations in mice. *Drug Metab Dispos*. 2018 Sep;46(9):1304-1309.
- Vendetti FP, Karukonda P, Clump DA, Teo T, Lalonde R, Nugent K, Ballew M, **Kiesel BF**, Beumer JH, Sarkar SN, Conrads TP, O'Connor MJ, Ferris RL, Tran PT, Delgoffe GM, Bakkenist CJ. ATR kinase inhibitor AZD6738 potentiates CD8+ T cell-dependent antitumor activity following radiation. *J Clin Invest*. 2018 Aug 31;128(9):3926-3940.
- **Patel A, Xue Y**, Hartley R, Sant V, Eles JR, Cui XT, Stolz DB, Sant S. Hierarchically aligned fibrous hydrogel films through microfluidic self-assembly of graphene and polysaccharides. *Biotechnol Bioeng*. 2018 Oct;115(10):2654-2667.
- Wang L, **Ma S, Hu Z**, McGuire TF, Xie XS. Chemogenomics systems pharmacology mapping of potential drug targets for treatment of traumatic brain injury. *J Neurotrauma*. 2019 Feb 15;36(4):565-575.
- Zhou C, Guo C, Li W, Zhao J, Yang Q, Tan T, **Wan Z**, Dong J, Song X, Gong T. A novel honokiol liposome: formulation, pharmacokinetics, and antitumor studies. *Drug Dev Ind Pharm*. 2018 Dec;44(12):2005-2012.
- **Wang Y**, Wang Z, Xu J, Li J, Li S, Zhang M, Yang D. Systematic identification of non-coding pharmacogenomic landscape in cancer. *Nat Commun*. 2018 Aug 9;9(1):3192.
- Zhao J, **Wan Z**, Zhou C, Yang Q, Dong J, Song X, Gong T. Hyaluronic acid layer-by-layer (LbL) nanoparticles for synergistic chemo-phototherapy. *Pharm Res*. 2018 Aug 24;35(10):196.
- **Bian YM**, He XB, **Jing YK**, Wang LR, Wang JM, Xie XQ. Computational systems pharmacology analysis of cannabidiol: a combination of chemogenomics-knowledgebase network

analysis and integrated in silico modeling and simulation. *Acta Pharmacol Sin.* 2019 Mar;40(3):374-386.

- Thorpe CT, Gellad WF, Mor MK, Cashy JP, Pleis JR, Van Houtven CH, **Schleiden LJ**, Hanlon JT, **Niznik JD**, Carico RL Jr, Good CB, Thorpe JM. Effect of dual use of veterans affairs and medicare Part D Drug benefits on antihypertensive medication supply in a national cohort of veterans with dementia. *Health Serv Res.* 2018 Dec;53 Suppl 3:5375-5401.
- **Niznik JD**, Zhang S, Mor MK, Zhao X, Ersek M, Aspinall SL, Gellad WF, Thorpe JM, Hanlon JT, **Schleiden LJ**, **Springer S**, Thorpe CT. Adaptation and initial validation of Minimum Data Set (MDS) mortality risk index to MDS version 3.0. *J Am Geriatr Soc.* 2018 Dec;66(12):2353-2359.
- Lu P, **Cai X**, Guo Y, Xu M, Tian J, Locker J, Xie W. Constitutive activation of the human aryl hydrocarbon receptor in mice promotes hepatocarcinogenesis independent of its coactivator Gadd45b. *Toxicol Sci.* 2019 Feb 1;167(2):581-592.
- **Hu Z**, Wang L, **Ma S**, Kirisci L, Feng Z, Xue Y, Klunk WE, Kamboh MI, Sweet RA, Becker J, Lv Q, Lopez OL, Xie XQ. Synergism of antihypertensives and cholinesterase inhibitors in Alzheimer's disease. *Alzheimers Dement (N Y).* 2018 Oct 14;4:542-555.
- Wu X, Xie S, Wang L, **Fan P**, Ge S, Xie XQ, Wu W. A computational strategy for finding novel targets and therapeutic compounds for opioid dependence. *PLoS One.* 2018 Nov 7;13(11):e0207027.
- LaPorte MG, Burnett JC, Colombo R, Bulfer SL, **Alvarez C**, Chou TF, Neitz RJ, Green N, Moore WJ, Yue Z, Li S, Arkin MR, Wipf P, Huryn DM. Optimization of phenyl indole inhibitors of the AAA+ ATPase p97. *ACS Med Chem Lett.* 2018 Sep 18;9(11):1075-1081.
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- **Cheng J, Wang S, Lin W, Wu N, Wang Y, Chen M, Xie XQ, Feng Z.** Computational systems pharmacology-target mapping for fentanyl-laced cocaine overdose. *ACS Chem Neurosci.* 2019 Aug 21;10(8):3486-3499.
- **Prokopenko AJ, West RE 3rd, Stubbs JR, Nolin TD.** Development and validation of a UHPLC-MS/MS method for measurement of a gut-derived uremic toxin panel in human serum: An application in patients with kidney disease. *J Pharm Biomed Anal.* 2019 Sep 10;174:618-624.
- **Gao J, Wu MX, Dai D, Cai Z, Wang Y, Fang W, Wang Y, Yang YW.** N-doped carbon dots covalently functionalized with pillar[5]arenes for Fe³⁺ sensing. *Beilstein J Org Chem.* 2019 Jun 7;15:1262-1267.

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PRESENTATIONS, POSTERS, AND PODIUM

- Chemistry and Pharmacology on Drug Abuse 2018, Boston, MA. Systems pharmacology analysis of cannabidiol (CBD). **Bian, Y**. August 2, 2018.
- The American Society for Bone and Mineral Research Annual Meeting 2018, Montreal, Quebec, Canada. p18 is required and regulated by BMP4 in muscle-derived stem cell-mediated osteogenesis and bone regeneration during aging. **Cheng, H**. September 28, 2018.

- American Society for Clinical Pharmacology & Therapeutics (ASCPT) 2018, Annual Meeting, Washington, D.C. “Evaluation of a testing platform for population-based preemptive pharmacogenomics. **Crisamore K.** March 13, 2019.
- Clinical Pharmacogenetics Implementation Consortium (CPIC) Open Meeting 2019, Memphis, TN. Evaluation of whole genome sequencing for pharmacogenomics testing. **Crisamore K.** June 6, 2019.
- American Association of Pharmaceutical Scientists (AAPS) Regional Meeting 2018, Morgantown, WV. “Towards precision medicine: A pilot study to evaluate pharmacogenomics testing platforms”. **Crisamore K.** July 7, 2019.
- Magee-Women’s Research Institute FAME-II Annual Meeting 2019, Pittsburgh, PA. Re-formulation of an extended release film based on clinical observations. **Durairajan, P.** April 4, 2019.
- McGowan Institute 2019 Research Retreat, Pittsburgh, PA. Local delivery of FK506 with impregnated nerve wraps accelerates nerve regeneration and recovery after injury. **Feturi F.** March 11, 2019.
- Plastic Surgery Research Council Annual Meeting 2019, Baltimore, MD. single locally implanted tacrolimus disk promotes long-term vascularized composite allograft survival via site specific immunosuppression and without systemic side effects. **Feturi F.** May 5, 2019.
- Division of Pharmacometrics (DPM)/ OCP/OTS/CDER/FDA/ Pharmacometrics Seminar 2018, FDA, Silver Spring, MD. Individualized physiologically based pharmacokinetic modeling to evaluate non-renal drug disposition pathways in patients with kidney disease: A novel precision medicine approach. **Franchetti, Y.** September 21, 2018.
- American College of Clinical Pharmacy Annual Meeting 2018, Bethesda, MD. Distinguishing the hepatic transport and metabolism pathways by modeling 14CO_2 production rate data: Application of PBPK modeling to erythromycin breath test in healthy subjects **Franchetti, Y.** September 24, 2018.
- American Society for Clinical Pharmacology and Therapeutics Annual Meeting 2019, Washington, D.C Individualized PBPK modeling of 14CO_2 production rate (iPBPK-R) to distinguish metabolism and transport of the non-specific probe drug erythromycin. **Franchetti, Y.** March 15, 2019.
- The Society of Industrial and Applied Mathematics (SIAM) Conference on Computational Science and Engineering 2019, Spokane, WA. Towards precision medicine: Simulation based parameter estimation for drug metabolism. **Franchetti, Y.** February 27, 2019.
- International Society of Pharmacoeconomics and Outcomes Research Annual Meeting 2019, New Orleans, LA. Impact of direct-to-consumer drug advertising during the super bowl on drug utilization and spending. **Gray, M.** May 22, 2019.
- Academy Health Annual Meeting 2019, Washington DC. Impact of direct-to-consumer drug advertising during the super bowl on drug utilization and spending. **Gray, M.** June 2, 2019.

- American Society for Clinical Pharmacology and Therapeutics Annual Meeting 2019, Washington, DC. The development of a clinical data visualization tool (CDVT): Easy and reproducible data cleaning and plotting using R Shiny. **Hu, Z.** March 13, 2019.
- American Association of Pharmaceutical Scientists Annual Meeting 2018, **Washington DC.** Impact of hydroxyl value of fatty acid-based suppository on condom compatibility. **Jhunjhunwala K.** November 6, 2018.
- Chemistry and Pharmacology of Drug Abuse Conference 2018, Boston MA. DAKB-GPCRs: A computational chemogenomics platform for drug abuse. **Jing, Y.** August 2, 2018.
- American Institute of Chemical Engineers 2018, Pittsburgh PA. Co-delivery of 2DG and V9302 via prodrug micellar formulation for synergistically target to cancer metabolism. **Luo, Z.** October 30, 2018.
- UPMC/Pitt Aging Institute Research Day 2018. Pittsburgh, PA. Factors associated with de-prescribing AChEIs in older nursing home residents with severe dementia. **Niznik, J.** December 7, 2018.
- Annual Scientific Meeting of the American Geriatrics Society 2019, Portland, OR. Factors associated with de-prescribing AChEIs in older nursing home residents with severe dementia. **Niznik, J.** May 3, 2019.
- Society for Biomaterials 2018, Atlanta, GA. Growth factor-free bioactive nanocomposite promotes bone regeneration in vivo. **Patel, A.** April 17, 2018.
- McGowan Institute Retreat - Rapid Fire Presentations 2018, Pittsburgh, PA. RegenMatrix: A growth factor-free bone graft for craniofacial bone regeneration. **Patel, A.** March 5, 2018.
- Pitt-CMU Chapters of Society for Biomaterials Day 2018, Pittsburgh, PA. Optimization and automation of fibrous hydrogel scaffold fabrication. **Patel, A.** November 20, 2018.
- American College of Clinical Pharmacology 2018, Washington, D.C. Activation of flavin-containing monooxygenase formation of a gut-derived cardiovascular disease risk factor in kidney disease. **Prokopienko, A.** September 23, 2018.
- American Society for Clinical Pharmacology and Therapeutics Annual Meeting 2019, Washington, D.C. Mechanistic Evaluation of Increased flavin-containing monooxygenase formation of the gut-derived cardiovascular disease risk factor trimethylamine-N-oxide in experimental kidney disease. **Prokopienko, A.** March 14, 2019.
- Endo 2019, New Orleans, LA. Estrogen sulfotransferase (est) as a mediator of ischemic acute kidney injury in mice. **S. Barbosa, A.** March 23, 2019.
- UPMC Aging Institute 2018. Pittsburgh, PA. Geographic variation in antidementia medication use among Medicare Part D beneficiaries with Alzheimer's disease. **Schleidan, L.** December 6, 2018.

- Great Lakes Breast Cancer Symposium 2019, Columbus, OH. Identify noncoding determinants of immune response in cancer. **Wang, Y.** May 3, 2019.
- UPMC Hillman Cancer Center 31st Annual Scientific Retreat 2019, Pittsburgh, PA. Identify noncoding determinants of immune response in Cancer. **Wang, Y.** June 9, 2019.
- American College of Clinical Pharmacology 2018, Washington, D.C. Model-based analysis to evaluate alteration of buprenorphine pharmacokinetics during pregnancy. **Zhang, H.** September 25, 2019.
- Simcyp Internship Presentation 2019, Princeton, NJ. A physiologically-based pharmacokinetic modeling approach to predict buprenorphine. **Zhang, H.** November 14, 2019.

POSTDOCTORAL FELLOWS

School of Pharmacy Postdoctoral Associates FY19

Name	Degree	Degree/University	Field	Country
Ahmed, Nayyar	PhD	Deakin University (Australia)	Immunology	India
Al Antary, Doaa	PhD	The University of Arizona	Pharmaceutics	Jordan
Ardila Montoya, Diana Catalina	PhD	University of Pittsburgh	Bioengineering	United States
Guan, Jibin	PhD	Shenyang Pharmaceutical University	Pharmacy	China
Gundala, Venkata Naveen Kumar	PhD	Jawaharlal Nehru Technological University	Biotechnology	India
Guo, Weiwei	PhD	Fudan University	Genetics	China
Joshi, Anand Anant	PhD	University of Kansas	Medicinal Chemistry	India
Joyasawal, Sipak	PhD	Vidyasagar University	Organic Chemistry	India
Junaid, Toluwalope	PhD	The University of Manchester, United Kingdom	Maternal and Fetal Health	Nigeria
Man, Viet Hoang	PhD	Polish Academy of Sciences	Physics	Viet Nam
Mohammed, Shabber	PhD	IIIM-Academy of Scientific Innovative Research	Chemical Sciences	India
Rathod, Sanjay	PhD	National Institute of Virology	Biotechnology	India
Ruttala, Hima	PhD	Yeungnam University (South Korea)	Pharmaceutical Sciences	India
Shaik, Imam	PhD	Texas Tech University	Pharmaceutical Sciences	India
Sun, Jingjing	PhD	Chinese Academy of Sciences	Polymer Chemistry and Physics	China
Vallicherla, Guru Raghavendra	PhD	CSIR-Central Drug Research Institute	Pharmacokinetics	India
Wang, Peng-Cheng	PhD	Chinese Academy of Sciences	Medicinal Chemistry	China

Name	Degree	Degree/University	Field	Country
Xu, Pengfei	PhD	Beijing Normal University	Developmental Biology	China
Xue, Ying	PhD	Fudan University	Pharmacology	China
Zhu, Junjie	PhD	Chinese Academy of Sciences	Medicinal Chemistry	China

Research Appendix



Research Appendix

FY19 PHS Funding

Investigator	Agency	Title	Direct \$	Indirect \$	Total
K. Empey	NIH	An adjuvant for an RSV prefusion F vaccine that safely protects infants via maternal vaccination (Yondola)	69,901	37,934	107,835
P. Empey	NIH	African American Pharmacogenomic Consortium Network (ACCOuNT): Discovery and Translation (Mylynda Massart)	3,133	0	3,133
P. Empey	NIH	All of Us (Reis) - Supplement	44,899	25,265	70,164
P. Empey	Washington University	Randomized Clinical Trial of Sodium Nitrate for Out-of-Hospital Cardiac Arrest (Kim)	7,825	4,421	12,246
C. Fernandez	NIH	Improving the disposition of antileukemic asparaginase after drug-induced immunotoxicity	199,698	112,829	312,527
P. Johnston	NIH	qHTS of Patient Derived HCC Models to Identify Novel Probes/Therapeutic Agents	255,772	144,511	400,283
L. Kirisci	NIH	Mechanisms of Change for an Effective Alcohol text Messaging - Chung	10,125	5,712	15,837
S. Li	NIH	Novel Antimicrobial Agents to Overcome Antibiotic Resistant Pseudomonas and MRSA Respiratory Infection	12,315	6,959	19,274
S. Li	NIH	PROJ 1: Signature-Directed, Sequential Delivery of Radiation Mitigators	12,315	6,650	18,965

Investigator	Agency	Title	Direct \$	Indirect \$	Total
S. Li	NIH	Nanotherapeutics for Synergistic Targeting of Myc in Prostate Cancer	22,1887	12,3862	345,749
S. Li	NIH	Developing Nano Technology for HER2 Directed Therapy	77,446	43,756	121,202
L. McDermott	NIH	Improved Methods and applications for interactive online virtual screening optimization - Koes	35,651	20,142	55,793
T. Nolin	NIH	PopulAtion health management to OPTimize Care in CKD (PANOPTIC-CKD) (Abdel-Kader) (Jhamb)	66,768	37,724	104,492
T. Nolin	UNIVCO	drug metabolizing enzyme and transporter function in chronic kidney disease	147,354	67,260	214,614
S. Poloyac	NIH	20-HETE Formation Inhibitors in Cardiac Arrest	250,000	119,304	369,304
S. Poloyac	NIH	CORE F: Signature-Directed, Sequential Delivery of Radiation Mitigators - Greenberger	4,2448	22,922	65,370
S. Poloyac	NIH	Melatonin Biosynthesis in Neuronal Mitochondria	2,396	1,354	3,750
S. Poloyac	MAGEE	Laboratory Center (LC): Microbicide Trails Network-Protocol Funds	44,426	25,100	69,526
S. Sant	NIH	Three-dimensional organoid models to study breast cancer progression	284,490	160,737	445,227
R. Tarter	NIH	Prescription Opioid Misuse: Pharmacist delivered Intervention at Point of Service (Eack)	7,725	43,65	12,090

Investigator	Agency	Title	Direct \$	Indirect \$	Total
R. Venkataramanan	NIH	Optimization of Drug Dosing in Pregnant Women through Research and Education - OPRC Administrative Core - Caritis	12,315	6,649	18,964
R. Venkataramanan	NIH	Optimization of Drug Dosing in Pregnant Women through research and Education - Impact of Pregnancy on Buprenorphine Pharmacokinetics and Pharmacodynamics-Caritis	35,989	19,434	55,423
R. Venkataramanan	NIH	Optimization of Drug Dosing in Pregnant Women through research and Education - Basic/Translational Investigations on Buprenorphine- Caritis	141,702	76,518	218,220
R. Venkataramanan	NIH	Pharmacologically-based Strategies for Buprenorphine Treatment During Pregnancy (MWRIF - Caritis)	160,387	90,619	251,006
L. Wang	NIH	Synaptic Resilience to Psychosis in Alzheimer Disease (Sweet)	35,587	16,755	52,342
J. Wang	NIH	Testing a Synergistic, Neuroplasticity-Based Intervention for Depressive Neurocognition (Price)	9,835	5,557	15,392
X. Xie	NIH	NIDA Center of Excellence for Computational Drug Abuse Research (CDAR)	807,070	273,746	1,080,816
W. Xie	NIH	PXR-Mediated Xenobiotic Response in the Pathogenesis Hemorrhagic Shock	225,000	127,125	352,125
W. Xie	NIH	Role of the ADAR1-mediated RNA editing? RNA sensing axis in sterile inflammation	12,315	69,581	19,2731

Investigator	Agency	Title	Direct \$	Indirect \$	Total
W. Xie	NIH	AHR-FGF21 Axis in Hepatic Steatosis and Metabolic Syndrome	230,986	121,139	352,125
W. Xie	NIH	Role and regulation of Beta-catenin in Cholestatic Liver Disease	7,514	4,057	11,571
D. Yang	NIH	Identification of Novel Human LncRNAs Controlling Human Cardiogenesis	22,801	12,883	35,684
D. Yang	NCI	The oncogenic role of EPIC1MYC axis in breast cancer	228,750	129,244	357,994
S. Li	NIH	Immunostimulatory Nanocarrier for Breast Cancer Immunotherapy	281,783	159,207	440,990
L. Rohan	MAGEE	Film Antiretroviral Microbicide Evaluation-Project 1	423,079	80,977	504,056
L. Rohan	MAGEE	Film Antiretroviral Microbicide Evaluation-Core A- Hillier	107,230	18,514	125,744
L. Rohan	MAGEE	Film Antiretroviral Microbicide Evaluation-Project 4 Hillier	368,464	132,322	500,786
L. Rohan	JOHNS	Development of Rectal Enema As Microbicide (DREAM)	73,201	43,189	116,390
L. Rohan	Louisville	Griffithsin-based Rectal Microbicides for PREvention of Viral EVTry (Prevent)	123,992	73,155	197,147
L. Rohan	MAGEE	Studies to Assess Interactions between Dapivirine and Vaginally Applied Over-the-Counter Products (CRIMP)	255,763	99,237	355,000
L. Rohan	MAGEE	Plant-derived Molecular Condom as an On-demand Nonhormonal Female Contraceptive	46,704	27,545	74,249
L. Rohan	MAGEE	Long Acting Film Technology for Contraception and HIV	1,081,069	269,824	1,350,893

Investigator	Agency	Title	Direct \$	Indirect \$	Total
L. Rohan	MAGEE	Laboratory Center (LC): Microbicide Trials Network	792,970	263,530	1,056,500
I. Hernandez	NHLBI	Patient and Ssystem-Level Determinants of Oral Anticoagulation Use in Atrial Fibrillatoin	147,738	11,566	159,304
J. Beumer	NIH	NCI ET-CTN with Phase I Emphasis at UPCI	183,979	99,349	283,328
J. Beumer	NIH	Cancer Center Support Grant	52,847	28,537	81,384
J. Beumer	NIH	University of Pittsburgh Microphysiology Systems Database Center	17,881	10,103	27,984
J. Beumer	NIH	Mechanism-Directed Sequential Delivery of Radiation Mitigators	56,682	30,608	87,290
J. Beumer	NIH	Application of mucolytic therapy in Patient-Derived Models of Pseudomyxoma	3,577	2,021	5,598
J. Beumer	NIH	Formulation and Optimized Delivery of JP4-039	58,336	32,960	91,296
J. Beumer	NIH	Testing Formulations for Small- molecule Drug Candidates Suitable for Early Pharmacokinetic Assessments	7,454	4,137	11,591
Total			380,756	207,715	588,471

FY19 Federal Other Funding

Investigator	Agency	Title	Direct \$	Indirect \$	Total
R. Tarter	CDC	Optimizing Pregnancy and Treatment Intervention for Moms 2.0 (OPTI-Mom 2.0) / (Univ. of Utah - Cochran)	13,924	7,867	21,791
D. Huryh	DOD	Optimizing Small Molecule Therapeutics for Diabetic Kidney Disease and Acute Kidney Injury - Hukriede	210,197	117,010	327,207
J. Pringle	FULT	Collaboration of Rural Agencies for Reduction of Opioid Related Overdoses	31,948	18,052	50,000
J. Pringle	HRSA	Community Health Worker Opioid Use Disorder Webinar (Eastcentral PA Area Health Education Center / Youngfelt) - EC UP6111	13,888	1,112	15,000
D. Huryh	Leidos	University of Pittsburgh Chemical Diversity Center	1,028,356	581,021	1,609,378
L. Rohan	MAGEE	Physiologically-based model of the female reproductive tract	122,733	16,918	139,651
J. Pringle	NIJ	NIJ Novel Quantitation Workflow for Improved Drug Surveillance	494,745	130,244	624,989
J. Pringle	PA	Enhancing the Access and Quality of Medication-Assisted Treatment (MAT) for Individuals with Opioid Use Disorder (OUD) in Rural Pennsylvania's Medicaid Primary Care Practices (Cole)	157,550	89,016	246,566
J. Pringle	PA	Pennsylvania Screening, Brief Intervention and Referral to Treatment (PA-SBIRT) (White)	248,581	74,574	323,155
J. Pringle	PA DOH	PDMP System User Training	14,598	6,279	20,877

Investigator	Agency	Title	Direct \$	Indirect \$	Total
M. Somma	PAPHARM	State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health	24,112	10,368	34,480
R. Patel	Penn State	Student Spaceflight Exploration Program (SSEP) Mission 13 to the International Space Station / Prime Sponsor: NASA	12,250	-	12,250
M. Somma	PPA	State Public Health Actions to Prevent and Control Diabetes	23,403	2,597	26,000
J. Pringle	SAMHSA	Targeted capacity expansion: Medication assisted treatment - prescription drug and opioid addiction	27,273	15,409	42,682
J. Pringle	SAMHSA	ARTEMIS: AHN Researching Treatment Effectiveness and Medical Integration Through SBIRT (Allegheny-Singer / Johnjulio)	191,693	108,307	300,000
J. Pringle	SAMHSA	Growing Evidence Based Prevention in Pennsylvania to Address Opioid Misuse (PSU - Welsh)	12,037	963	13,000
M. Reynolds	SAMHSA	University of Pittsburgh PA Studies MAT Training Program (David Beck)	58,620	4,610	63,230
J. Pringle	SAMHSA	Commonwealth Opioid Medical MAT Training Program (COMMIT)- Washington County, PA	419,543	100,291	519,834
M. Reynolds	SAMHSA	Pittsburgh SBIRT: Training Health Professions Students to Conduct Screening, Brief Intervention and Referral to Treatment	218,108	17,449	235,557
M. Reynolds	SAMSHA	SBIRT-Student Training (Douaihy)	79,432	6,355	85,787
X. Ma	UCONN	Short and long-term impacts on drug metabolism, therapeutic efficacy, and drug-induced toxicity due to drug exposure	13,636	7,364	21,000

Investigator	Agency	Title	Direct \$	Indirect \$	Total
J. Pringle	VA	Suicide Prevention Accelerated Research Construct (SPARC) / Task N0121	626,198	353,802	980,000
J. Pringle	VA	Web and Print Toolkit Development for Rural Suicide Prevention (Western Interstate Commission for Higher Education)	41,533	23,467	65,000
J. Pringle	VRHA	Rural Communities Opioid Response Program - Planning (O'Connor)	40,255	22,745	63,000
J. Pringle	WEST	First Responder Collaboration with Treatment Services for Overdose Reduction (SCOPE)	136,009	76,845	212,854
J. Beumer	DOD	Small molecules targeting AR in castration-resistant prostate cancer	27,603	15,596	43,199
L. Rohan	NSF	Pitt I-Corps Site	3,000	-	3,000
Total			1,185,774	523,623	1,709,397

FY19 Industry Funding

Investigator	Agency	Title	Direct \$	Indirect \$	Total
R. Venkataramanan	UT	PBPK and Population pharmacokinetic analysis of	70,558	21,167	91,725
Total			70,558	21,167	91,725

FY19 Foundation/Association Funding

Investigator	Agency	Title	Direct \$	Indirect \$	Total
P. Empey	Mellon	Precision Medicine Implementation and Commercialization	171,328	68,182	239,510
S. Aspindall	DONA	De-prescribing of Anti-Dementia Medications	30,970	3,097	34,067

Investigator	Agency	Title	Direct \$	Indirect \$	Total
K. Coley	NACDS	Impact of Pharmacist Intervention in Hepatitis B Vaccination in Adult Patients with Diabetes (Prime Sponsor: GSK)	305,059	45,759	350,818
K. Doong	PPA	Community pharmacist-provided comprehensive medication management services a case series	1,000	-	1,000
A. Lapping	PPA	NDPP	600	-	600
D. Yang	ACS	The regulation of cell cycle by long non-coding RNA in breast cancer (ACS)	165,000	33,000	198,000
M. Somma	CPF	Community Pharmacy Practice Transformation Initiative Facilitating Partnerships between Community Pharmacy Enhanced Services Networks CPESN and Schools of Pharmacy	40,000	-	40,000
J. Pringle	HILL	Hillman Overdose Prevention	150,000	-	150,000
L. Rohan	Magee	Rohan Pharmaceutical Laboratory Formulation of TAF	219,651	9,321	228,972
J. Pringle	PA Higher Education Foundation	Implementing SBIRT in State Colleges (Prime Sponsor: PCCD)	39,402	7,880	47,282
K. Coley	PCORI	A Statewide Community Pharmacy Research Network that Aligns Patients, Pharmacists & Researchers	178,527	71,410	249,937
P. Empey	LOWEN	Application of machine learning to pharmacogenomics and medication outcome prediction	83,353	-	83,353
J. Beumer	Alliance for Clinical Trials in Oncology Foundation	A Randomized Double-blinded Phase III Study of Cabozantinib versus Placebo in Patients with Advanced Neuroendocrine Tumors after Progression on Everolimus	220,000	22,000	242,000
Total			1,604,890	260,649	1,865,539

FY19 Other Funding

Investigator	Agency	Title	Direct \$	Indirect \$	Total
J. Pringle	PA	Pennsylvania Opioid Overdose Reduction Technical Assistance Center	672,500	134,500	807,000
J. Pringle	PA	First Responder Opioid Training Module	255,591	144,409	400,000
J. Pringle	PA	Settlement Agreement: PA DHS Centers of Excellence	186,257	22,351	208,608
V. Sant	SMRI	Chromoglycate adjunctive therapy for patients with schizophrenia (Nimgaonkar)	18,070	2,711	20,781
L. Rohan	Long Grove Pharmaceuticals	Biorelevant Dissolution Study	14,691	9,329	24,020
J. Pringle	USCI	PCCD-SAEDR SBIRT Training in Community Pharmacy	57,692	17,308	75,000
Total			1,204,801	330,608	1,535,409

RESEARCH RECOGNITION OF FACULTY

Faculty members received various forms of recognition for their accomplishments and their expertise during FY19.

27 faculty members served on scientific journal editorial boards.

12 faculty members served on NIH grant review committees.

Members of Editorial Boards

Faculty Member	Number	Editorial Board
Lucas A. Berenbrok, PharmD, MS, BCACP, CTS	1	Journal of American Pharmacists Association
Jan H. Beumer, PharmD, PhD, DABT	3	Cancer Chemotherapy and Pharmacology Journal of Chromatography and Separation Techniques Oncology Research
Kim C. Coley, PharmD, FCCP	2	PPA Editorial Board Journal of the American College of Clinical Pharmacy
James Coons, PharmD, FCCP, BCCP	1	Cardiovascular Therapeutics
Colleen Culley, PharmD, BCPS	1	Clin-Alert

Faculty Member	Number	Editorial Board
Barry Gold, PhD	2	Editorial Advisory Board of Future Medicinal Chemistry Advisory Editorial Board for Medicinal Chemistry Communications
Inmaculada Hernandez PharmD, PhD, FACC	1	BMI Cardiovascular Disorders
Donna M. Huryn, PhD	3	Organic Letters Organic Reactions Associate Editor - ACS Med Chem Letters
Paul A. Johnston, PhD	1	Journal of Assays and Drug Development Technologies, Mary Ann Liebert, Inc. publishers
Sandra L. Kane-Gill, PharmD, MS, FCCP, FCCP	6	Critical Care Medicine Annals of Pharmacotherapy-Adverse Reactions and Medication Safety Panel Advances in Pharmacoepidemiology and Drug Safety Hospital Pharmacy, Critical Care Column Editor Pennsylvania Patient Safety Advisory Journal of Pharmacy Practice, Critical Care
Song Li, MD, PhD	5	Journal of Gene Medicine Biological Procedure Online American Journal of Cancer Therapy and Pharmacology Journal of NanoMedicine and Application Asian Journal of Pharmaceutical Sciences
Xiaochao Ma, PhD	3	Advances in Pharmacoepidemiology & Drug Safety Journal of Drug Metabolism & Toxicology Nuclear Receptor Research
Lee A. McDermott, PhD, MBA	2	Journal of Drug Research and Development Chronicles of Pharmaceutical Science
Melissa A. Somma McGivney, PharmD, FCCP, FAPhA	2	Innovations in Pharmacy Journal of the American College of Clinical Pharmacy
Thomas D. Nolin, PharmD, PhD	3	American Journal of Kidney Diseases American Journal of Kidney Diseases; 'Research Letters' Clinical Journal of the American Society of Nephrology
Lisa Cencia Rohan, PhD	2	AIDS Research and Therapy Guest Editor, MDPI Pharmaceuticals
Shilpa Sant, PhD	5	Associate Editor, IEEE Transactions on NanoBioScience Scientific Reports In Silico Pharmacology JSM Regenerative Medicine Biomaterials, Frontiers in Molecular Biosciences, Bioengineering and Biotechnology and Materials
Vinayak Sant, PhD	1	Enliven: Biosimilars and Bioavailability
Amy L. Seybert, PharmD, FASHP, FCCP	1	International Scholarly Research Network Critical Care Pharmacy
Ralph E. Tarter, PhD	5	Drug and Alcohol Dependence Experimental and Clinical Psychopharmacology Clinical Psychology Review Prevention Science International Journal of Person Centered Medicine
Gordon J. Vanscoy, PharmD, CACP, MBA	1	Journal of Thrombosis and Thrombolysis
Raman Venkataramanan, PhD	8	American Journal of Analytical Chemistry Therapeutic Drug Monitoring Open Pharmacology Journal Open Current Clinical Pharmacology

Faculty Member	Number	Editorial Board
		Open Clinical and Experimental Pharmacology Open Transplantation Open-International Journal of Pharmacokinetics BOAJ Pharmaceutical Sciences
Junmei Wang, PhD	2	Current Computer-Aided Drug Design Bioenergetics
LiRong Wang, PhD	2	Journal of Pharmacy & Pharmaceutics Enliven Archive: Biosimilar and Bioavailability
Wen Xie, MD, PhD	10	Drug Metabolism World Journal of Gastroenterology Drug Metabolism Letters Drug Metabolism Reviews Molecular Endocrinology Drug Metabolism and Disposition Endocrinology Molecular Pharmacology Chinese Medical Journal Acta Pharmaceutica Sinica B (APSB)
Xiang-Qun (Sean) Xie, PhD, EMBA	2	American Association of Pharmaceutical Scientists (AAPS) Journal US FDA Advisory Committee, the United States, the Food and Drug Administration (FDA))
Da Yang, MD, PhD	2	Journal of Gene Medicine Molecular Carcinogenesis

Faculty Participation in NIH Review Committees and Panels

Faculty Member	Department	No. of Panels
Jan H. Beumer, PharmD, PhD, DABT	Pharmaceutical Sciences	1
Kerry Empey, PharmD, PhD	Pharmacy and Therapeutics	1
Donna M. Huryn, PhD	Pharmaceutical Sciences	2
Paul A. Johnston, PhD	Pharmaceutical Sciences	1
Levent Kirisci, PhD	Pharmaceutical Sciences	1
Song Li, MD, PhD	Pharmaceutical Sciences	2
Lee A. McDermott, PhD, MBA	Pharmaceutical Sciences	1
Samuel M. Poloyac, PharmD, PhD	Pharmaceutical Sciences	1
Lisa Cencia Rohan, PhD	Pharmaceutical Sciences	5
Shilpa Sant, PhD	Pharmaceutical Sciences	2
Wen Xie, MD, PhD	Pharmaceutical Sciences	3
Da Yang, MD, PhD	Pharmaceutical Sciences	3

School of Pharmacy Publications in Peer-Reviewed Journals

Abraham O, Feathers A, **Grieve L**, Babichenko D. Developing and piloting a serious game to educate children about over-the-counter medication safety. *J Pharm Health Serv Res*. 2019 Feb; 10(2): 235. doi: 10.1111/jphs.12292.

Abraham O, Feathers A, Mook H, **Korenski A**. The perceived benefits of student pharmacists educating children about over-the-counter medication safety. *Curr Pharm Teach Learn*. 2019 Feb; 11(2): 184-191. doi: 10.1016/j.cptl.2018.11.005. Epub 2018 11 22. PMID 30733016.

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Strategic Plan



The Plan for Pitt

Making a Difference Together

Academic Years 2016–2020



Over the past several decades, the University of Pittsburgh has risen to the ranks of the top universities in the world by building exceptional research strength and academic programs that prepare students for productive and meaningful lives. In addition, as an institution that is at once interwoven in the fabric of the hardworking communities of Western Pennsylvania and engaged globally, we have established a rich history of community support and global impact, making a difference in the lives of individuals, communities, and the world.

From this enviable position, we have united in launching a new phase of institutional planning, determined to build on strengths and confront challenges to hone our unique identity as a top university deeply engaged with the world beyond our campus. Through wide-ranging discussions with the University community and beyond—community leaders in our region and commonwealth, the Board of Trustees, alumni, faculty, staff, and students—we have developed strategies for navigating the challenging terrain we face in our region and the global landscape of higher education and identified a collection of strategic initiatives that will focus efforts to advance our mission over the next five years.

Through this plan, we will add to Pitt's impressive record of achievement in improving lives and making the world better through knowledge. Our efforts will be purposeful, coordinated, and collaborative, and success will be measured in terms of accomplishment and impact.

Together we will make a difference.





The Plan

We will build upon our record of accomplishment and reputation as world-class university. As a place where pioneering research and academic achievement combine with holistic approaches to student engagement to provide outstanding educational experiences. As a place engaged with alumni, private, public, government, and international partners on strategic initiatives that advance human understanding and achievement and build community strength. And as a place enriched by its embrace of diversity and inclusion, its agility and entrepreneurial spirit, and the commitment and excellence of its people.



Planning Framework

MISSION

- Offer superior educational programs
- Advance the frontiers of knowledge and creative endeavor
- Share expertise with private, community, and public partners

STRATEGIC PRIORITIES

In advancing our mission, we will rank among the finest universities in the world, emphasizing as Strategic Priorities:

Consistently Deliver Excellence in Education

Impact Through Pioneering Research

Build Community Strength

Extend Our Global Reach

Provide Top Value

Secure an Adequate Resource Base

DRIVERS

As we strive for excellence and impact in advancing our mission and vision, we face profound challenges and opportunities in our region and the global landscape of higher education. These demand dynamic responses, presented here as drivers of foundational change.

Partnering for Impact

We will facilitate internal collaboration to enrich the interdisciplinarity of our academic endeavors and enhance operational efficiency; and actively pursue engagements with private, public, government, and international partners on strategic initiatives.

Harnessing Information

We will transform the scale and impact of our activities by harnessing information in pursuit of grand challenges. This will drive innovative approaches to research, student learning and development, community and alumni engagement, and operational excellence.

Shaping Our Culture

Ours will be a culture in which faculty, staff, students, and alumni all strive for excellence. We will invest in the continuous development of our people; and become more diverse and interconnected, agile in our decision making, and engaged as a community. With resiliency, integrity, and determination, we will be entrepreneurial and innovative in achieving impactful results.

VALUES

With respect for each other and our rich tradition, the University of Pittsburgh embraces as core values:

- Excellence, Impact
- Integrity, Virtue
- Collaboration, Collegiality
- Diversity, Inclusion
- Entrepreneurship, Agility

Goals

We aspire to be a university that ...

Prepares students to lead lives of impact through a supportive environment focused on a holistic and individualized approach to learning inside and outside the classroom.

Advances the frontiers of knowledge and makes a positive impact on the world through collaborative and multidisciplinary approaches to research that focus on areas of great societal need.

Strengthens our communities—from the Pitt community, to our region and the world around us—by expanding engagements, supporting collaborations, and embracing a global perspective.

Embodies diversity and inclusion as core values that enrich learning, scholarship, and the communities we serve.

Engages with the world to explore and address global issues that improve life in the world's local communities.

Supports success through a foundation of strong internal culture, a robust capacity to partner, outstanding infrastructure, and effective operations.





GOAL 1:

Advance Educational Excellence

We aspire to be a university that prepares students to lead lives of impact through a supportive environment focused on a holistic and individualized approach to learning inside and outside the classroom.

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Advance Educational Excellence

We aspire to be a university that prepares students to lead lives of impact through a supportive environment focused on a holistic and individualized approach to learning inside and outside the classroom.

Strategies

- **Enhance the curriculum** at all levels through innovative, discipline-based approaches to teaching and learning and appropriate uses of technology to enrich the on-campus learning environment
- **Serve as a leader in personalizing educational experiences** of undergraduate, graduate, and professional students, with particular attention to mentorship, advising, and tailoring engagement to the goals of individual students
- **Enrich the student experience** through engagement with diverse cultures and perspectives and expanded opportunities for study abroad and by integrating global perspectives in the curriculum
- **Promote access and affordability** through partnerships with local school districts, increased voluntary support for student aid, improved time-to-degree for all students, and expanded access to masters and professional education



GOAL 2:

Engage in Research of Impact

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Engage in Research of Impact

We aspire to be a university that advances the frontiers of knowledge and makes a positive impact on the world through collaborative and multidisciplinary approaches to research that focus on areas of great societal need.

Strategies

- **Identify and engage in strategic research opportunities** where we can have significant impact on society
- **Position the University to participate in large research collaborations** through investments in shared core facilities; strategic recruitment; and partnerships with industry
- **Expand our computational capacity**, human and physical, to meet research needs across a broad range of disciplines into the future
- **Extend the impact of our research** through application to practice, policy development, and commercial translation



GOAL 3:

Strengthen Communities

We aspire to be a university that strengthens our communities—from the Pitt community, to our region and the world around us—by expanding engagements, supporting collaborations, and embracing a global perspective.

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We aspire to be a university that strengthens our communities—from the Pitt community, to our region and the world around us—by expanding engagements, supporting collaborations, and embracing a global perspective.

Strategies

- **Strengthen life-long alumni connections** to the University through improved outreach and engagement and expanded continuing education opportunities
- **Foster a culture of civic engagement,** seeking to increase societal impact
- **Increase the economic impact** of our work through fostering entrepreneurship, commercialization, corporate engagement, and mutually beneficial public and private partnerships



GOAL 4:

Promote Diversity and Inclusion

We aspire to be a university community that embodies diversity and inclusion as core values that enrich learning, scholarship, and the communities we serve.

Goal 4:

Promote Diversity and Inclusion

We aspire to be a university community that embodies diversity and inclusion as core values that enrich learning, scholarship, and the communities we serve.

Strategies

- **Transform the campus climate** to reinforce the value of diversity and inclusion as essential to advancing our teaching, research, community engagement and to enriching the student experience
- **Enrich the student experience** through engagement with diverse cultures and perspectives, expanded opportunities for study abroad, and by integrating global perspectives in the curriculum
- **Help to attract and retain a diverse regional population and University community** through the recruitment and retention of a diverse student body, faculty, and staff



GOAL 5: Embrace the World

We aspire to be a university that is committed to convening bright minds to explore and address global issues that improve life in the world's local communities.

Goal 5:

Embrace the World

We aspire to be a university community that is committed to convening bright minds to explore and address global issues that improve life in the world's local communities. By engaging in research, policy, partnerships, and the study of language and culture, we open the door to global citizenship.

Strategies

- **Connect our domestic and international pursuits** to generate synergies that help strengthen our communities
- **Cultivate globally capable and engaged students** for lives of impact in their communities and beyond
- **Convene a global community of researchers** that advances our frontiers of knowledge and tackles real-world problems
- **Rewire and improve our infrastructure** to streamline, facilitate, and expand engagement with the world



GOAL 6:

Build Foundational Strength

We aspire to be a university that supports success through a foundation of strong internal culture, a robust capacity to partner, outstanding infrastructure, and effective operations.

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Build Foundational Strength

We aspire to be a university that supports success through a foundation of strong internal culture, a robust capacity to partner, outstanding infrastructure, and effective operations.

Strategies

- **Build a faculty to advance the goals and strategies** of the strategic plan
- **Create a supportive and productive work environment** that recognizes the contributions of our faculty and staff by offering competitive compensation and providing professional development opportunities
- **Transform information infrastructure** to expand our reach and better support recruitment, research, learning, and operational efficiency
- **Strengthen administrative and operational efficiency** by improving communication and collaboration between and among academic and business units
- **Enhance our ability to partner** both internally and with public and private partners locally, nationally, and globally
- **Facilitate and support engagement with Pitt**



