

OSU COLLEGE OF PHARMACY  
ANNUAL ACADEMIC REPORT: 2017-18

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**1. Performance Indicators:** *Provide a brief summary and assessment of the college's performance on key strategic metrics.*

Indicators of Student Success, Retention and Diversity: The College of Pharmacy continues to maintain a record of retention and 4-year on-time graduation rate in the PharmD program above 90%. The level of preparation of our PharmD graduates for entering the workforce or advanced training is illustrated in their performance on the North American Pharmacist Licensure Examination (NAPLEX) and the Multistate Pharmacy Jurisprudence Examination (MPJE) – the two licensing exams that all graduates must pass in order to practice as pharmacists. Graduates of the OSU/OHSU PharmD program had a first-time pass rate on the NAPLEX of 96%, well above the national averages of 88%. Their performance on the MPJE of 88% passing also exceeded the national average of 85%. Indicative of a strong clinical emphasis in the program, 28% of the graduating class secured competitive postgraduate residencies at a variety of health systems, hospitals and clinics across the nation.

The PharmD program received a total of 407 applications in 2018 for the incoming class of 2022. A total of 114 offers of admission were extended and 93 were accepted. Two first year students will enter after deferring admission from the previous year, for a total class size of 95 P1 students. The College remains committed to supporting a diverse and inclusive community. The percentage of students in the PharmD program identified as being US minority students is approximately 47% - highest among academic programs at OSU.

The 407 PharmD program applicants this year is down from 489 the previous year, 649 in 2016 and 734 in 2015. The decline reflects a nationwide trend. Competition for top students has intensified and schools across the country struggle to meet their target class sizes. To date, the size of the PharmD program remains stable but has required more intentional focus on recruiting applicants. Flexibility in our budget model has permitted us to maintain a class size that is balanced with the availability of employment openings and postgraduate residencies. Our focus on graduating well-trained professionals guides our commitment to only admit well-qualified students we believe will succeed in our rigorous program. We continue working to improve recruiting and marketing strategies that highlight our reputation for quality and value, the success of our graduates, research opportunities, and the benefits of our formal affiliation with OHSU, a top-tier academic health science center.

In AY18, a record 10 PhD degrees were awarded to students with thesis major advisors in the Department of Pharmaceutical Sciences. This includes two in the PharmD/PhD program. Admissions to the graduate program in Pharmaceutical Sciences is highly competitive and the total number of graduate students enrolled increased slightly. Eight new PhD students are expected to enter the graduate program in the fall and one is a US minority.

Although the College does not have its own undergraduate program, the faculty are deeply committed to providing high-impact research experiences to undergraduate students from across campus who are intent on pursuing graduate education in biomedical and health sciences research or entering a professional school. In AY18, Pharmaceutical Sciences faculty mentored 43 undergraduate students in research laboratory experiences, of whom 34% were URM students, and five were conducting Honors college thesis research.

University metrics on external funding and research expenditures are not yet available for FY18. We anticipate the numbers to be similar to those from FY17, when faculty secured 29 new grants and contracts totaling over \$5.88M and research expenditures were \$3.67M.

**2. Teaching and Learning: *Discuss the college's accomplishments on the shared goal of providing a transformative educational experience for all learners.***

The major redesign of the pharmacy professional curriculum entered its fourth and final year in AY18, bringing the full sequence of changes onboard. A wide variety of improvements were implemented including:

Assessment of revised courses in the first and second years of the curriculum provided evidence of need for a few changes as part of continuous improvement of the revised curriculum, including adding more clinical content to early foundational classes and revamping the interprofessional education series that includes Western University's osteopathic program in Lebanon and nursing students from Linn-Benton Community College. Required co-curricular activities were designed by faculty/student committees and implemented for first year students. The goal is to assure that all students participate in activities designed to advance personal and professional readiness and is a new requirement of accreditation. This will be expanded to all classes next year.

The Pre-APPE Readiness (PAR) block, the most pedagogically unique change in the new curriculum, is a four-week assessment for advanced clerkships at the end of the third year. The PAR Block was completed for the second time and benefitted from refinements that improved student success on a number of clinical knowledge and case-based performance activities. Assessment of PAR block outcomes last year led to a new activity added to P3 pharmacy practice: one hour of interactive learning was added to the course weekly to target fundamental knowledge areas of pharmacotherapy.

Assessment of the PAR block indicated students have better awareness of their strengths, weaknesses, and personal goals as they enter advanced experiential clerkships, thus allowing them to have greater confidence and help direct their learning. This serves to equalize opportunities for students to succeed in the P4 year. Students have expressed value in extension of advanced experiential clerkships as they work to differentiate their abilities, explore different career paths, and prepare for post-graduate opportunities.

The innovative PAR Block approach to ensure students are adequately prepared for advanced experiential training has becoming a signature feature of the curriculum and has gained attention from our peer institutions. Pedagogical changes related to the PAR Block were also recognized by the American Association of Colleges of Pharmacy (AACP) competition for Excellence in Assessment. Our submission was entitled *Gatekeeper or Facilitator: Empowering Students to Optimize Experiential Learning through Structured Summative and Formative Assessments*. The OSU team was one of three selected to present on Pre-APPE Readiness models at the 2018 AACP annual meeting in Boston in July.

The Early Assurance Program (EAP) is an important part of our effort to build a robust and diverse pipeline of applicants to the PharmD program. In AY18 we opened up the EAP to colleges throughout the state and renamed it EAP Oregon. Now students may attend any accredited college or university in Oregon while completing their prerequisites and bachelor's degree. We believe this will help recruit a more diverse and higher-achieving population to the PharmD program if they don't have to come to OSU until they start pharmacy school. This policy should also permit students to prepare for pharmacy school as economically as possible. One of the College's advisors meets with each EAP student individually every term.

We further expanded our long-standing EAP arrangement with Portland State University to include regular and transfer students with sophomore and junior class status to help elevate pipeline diversity. Finally, we instituted an affiliation with the OSU Honors College to formally incorporate Honors pre-pharmacy students into the EAP program.

An OSU team of three P2 students, Chelsea Harmon, Rachel Proteau and Tyler Lantz, placed third out of 80 schools in the 2018 American College of Clinical Pharmacy's (ACCP) Clinical Research Challenge. The team developed a proposal on antibiotic prescribing practices in hospital emergency departments. This was the third year in a row an OSU team placed in the top three. The team was invited to present their research design at the 2018 ACCP Global Conference in Seattle.

PharmD post-graduate training was successful for the year with the graduation of seven advanced trainees in first and second year residencies that included: a PGY1 resident at the Student Health Services at OSU; a PGY1 resident shared with Salud clinic in Woodburn; two PGY2 Ambulatory Care residents with Central City Concern; a newly created PGY2 Ambulatory Care residency with Richmond Clinic; and both an Education Fellow and an Infectious Diseases Fellow at the Portland campus.

The graduate programs in Pharmaceutical Sciences underwent the required 10-year self-study and external program review in May 2017, led by Dr. Kerry McPhail and the Graduate Studies Committee. The final report of the review committee and external examiners was extremely positive and highlighted achievements in growth of the program, increased funding for graduate assistantships, and success of our PhD graduates.

Several Pharmaceutical Sciences PhD students received prestigious scholarships and awards for their research: David Gallegos received the prestigious 2018 Kilmer Prize which is administered and supported jointly by the American Pharmacists Association and the American Society of Pharmacognosy; Brianna Cote was awarded a competitive Oregon Lottery Scholarship; Adel Al-Fatease won the award for best oral presentation at OHSU's Research Week; and Richard Tehan received a scholarship from the Oregon Mycological Society.

Faculty in Pharmaceutical Sciences worked with colleagues from the Comparative Health Sciences graduate program in the College of Veterinary Medicine to expand a course in grant writing and professional development for graduate students in both programs.

**3. Research and Creative Work: *Discuss the college's accomplishments on the shared goal of advancing high impact research and creative work while building preeminence in the three signature areas of distinction.***

The Department of Pharmaceutical Sciences partnered with other units on campus to hire two outstanding computational biologists over the past year. Dr. Kevin Brown focuses on mathematical modeling in systems biology and nonparametric statistical methods for inference of network structure from data. Dr. Maude David studies the gut-brain axis, to understand how microbes can impact our behavior, specifically in Autism Spectrum Disorder and anxiety.

The College was instrumental in the recruitment of Prof. Richard Van Breemen to join OSU as the Director of the Linus Pauling Institute. His tenure home is in the Department of Pharmaceutical Sciences. Van Breemen was previously on the College of Pharmacy faculty at the University of Illinois, Chicago where he established a career as an internationally-recognized expert on cancer prevention by nutritional and dietary supplements. He brings with him a large research group, including six PhD students that are now part of the Pharmaceutical Sciences program.

The College of Pharmacy was particularly focused in developing and expanding faculty entrepreneurship in FY18. We partnered with the OSU Office of Commercialization and Corporate Development to host the first 'Innovation Day' put on by OCCD staff. The event was open to all faculty, post-docs and senior graduate students in the College. The day-long seminar featured talks and training sessions that covered entrepreneurship and start-up opportunities, writing invention disclosures and patenting in the life sciences, conflict of interest considerations, industry funded research and Federal SBIR/STTR funding. Speakers included patent attorneys, successful entrepreneurs, and representatives from the OSU Advantage Accelerator.

Pharmaceutical Sciences faculty co-founded three new start-up companies developed around research from their laboratories. Gadusol Laboratories was co-founded by Professors Taifo Mahmud and Alan Bakalinsky (OSU Dept. of Food Science) and applies proprietary OSU synthetic biology methodology to produce natural sunscreen compounds that offer natural sun protection and are sustainably sourced and environmentally safe. Gadusol Laboratories is an Oregon BEST company and a National Science Foundation SBIR grantee. Lipidomics Inc. develops cosmetics and pharmaceutical products that help prevent inflammatory skin conditions, such as eczema, by replenishing lipids that are deficient in the skin of eczema subjects. Lipidomics Inc. was co-founded by Professors Arup and Gitali Indra, and is funded by ONAMI. Celnex, LLC is developing a family of proprietary compounds that serve as targeted anti-cancer therapies to treat Ewing's sarcoma, a common form of bone cancer in children. Celnex was co-founded by Professors Mark Leid and Monika Davare (OHSU Dept. of Pediatrics) and is currently supported by venture development funds (OSU) and the Biomedical Innovation Program (OHSU).

Pharmacy remains one of the most active units at OSU in submitting invention disclosures and protecting intellectual property. Faculty filed 11 patent applications in FY18 and signed new licensing agreements on two existing patents.

In FY17, the College committed a significant investment in faculty research success by providing seed funding of \$400K among 11 faculty and another \$100K to replace aging equipment and acquire new, cutting edge instruments. Now in FY18, this investment has begun paying dividends. The seed funding spurred submission of 19 new grant proposals, of which five have been funded for nearly \$1.5M. Eleven peer-reviewed papers have been published and seven more are in review. Additionally, two new invention disclosures have been submitted along with three patents being filed.

Investments in faculty success for FY18 include \$110K for bridge funding to support faculty with a temporary lapse in external support. This funding by the College allows faculty to be productive and maintain competitiveness during gaps in funding and to weather these gaps without losing critical research staff. Other efforts to advance faculty development include enlisting the services of a grant writing coach to help faculty win more research grants and providing access to editorial services to improve manuscript and grant applications.

The College promotes engagement of PharmD students in their P4 year to participate in faculty-directed research. For those students that conduct research leading to first authorship on a podium or poster presentation, the College helps offset the expense of the students attending a national meeting to present their finding. In AY18, 12 students took advantage of this program.

Faculty productivity, as measured by disseminating their research and scholarship and submitting grant applications, reached an all-time high last year. Faculty published 93 articles in peer-reviewed journals and authored or co-authored 19 book chapters. College investigators submitted 99 grant proposals in FY18, requesting over \$58M in total costs. Both the number of proposals and the total funds requested are up 30% from FY17.

Cross-disciplinary and inter-institutional partnerships continue to drive much of the high-impact research by our faculty. In particular, are the collaborations with investigators at OHSU. Illustrative examples are: Professors Oleh Taratula and Daniel Marks (OHSU Pediatrics) developed a safe therapy to combat muscle wasting in cancer patients (cachexia) without special diet or exercise regimens; Professors Daniel Hartung and Dennis Bourdette (OHSU Neurology) led an influential study that suggests financial conflicts of interest may be driving the use of some drugs in the Medicare program; Professors Gaurav Sahay and Kelvin MacDonald (OHSU Pulmonology) developed a simple inhalation-based product for delivering mRNA-loaded nanoparticles to cystic fibrosis patients; and Professors Sahay and Sadik Esener (OHSU Knight Cancer Institute) reported development of a new nanomaterial, termed nanodrills, that can cross cell membranes, thus providing a novel platform for intracellular delivery of a variety of payloads.

Other collaborative ventures include a project led by Profs. Arup Indra, Gitali Indra and Fred Stevens to use a byproduct of the local meadowfoam oilseed industry to develop an agent that protects skin from damage by the sun.

**4. Outreach and Engagement: *Discuss the college's accomplishments on the shared goal of strengthening OSU's impact and reach throughout Oregon and beyond.***

Students from OSU, OHSU and PSU in the Pharmacy, Medicine, Dentistry, Nursing and Public Health programs partnered to develop the Bridges Collaborative Care Clinic. This is a new interprofessional, student-run free clinic that assists vulnerable populations by providing low-barrier, participant-centered care and services in the Portland Metro area. The clinic opened in October.

The College was host to a group of 25 visiting Japanese pharmacists from the Nippon Pharmacists Association. The group was given tours of a variety of community and hospital pharmacies, attended lectures on pharmacy practices in the US and visited both the Portland/OHSU and Corvallis campuses.

One way we maintain strong ties to our stakeholders throughout the community is through our extensive Experiential Education program. This includes a network of nearly 450 practicing pharmacists in the region that serve as preceptors to our students on internships and clerkships. In addition to the interactions with this group through the eight, six-week long clerkships the P4 students complete, the Assistant Dean for Experiential Programs visits these preceptors regularly to ensure the quality of the training sites and to maintain relationships with them. We also provide preceptor development via a wide variety of on-line and in-person training programs.

Implementation of the PAR Block described in Section 2 facilitated making numerous new connections with a variety of external healthcare professional who helped to implement the many small group components of the program as well as evaluate student performance in Objective Structured Clinical Examinations (OSCEs). Over 30 professionals from outside the College provided support ranging from leading *Law & Ethics* discussion sections and *Complex Case Facilitations*, to *Case Evaluations*. Feedback from participants in these sessions provided valuable input regarding our students' preparation and served as a bridge to new groups at OHSU and the larger pharmacy community.

The College is very active in continuing professional education and presentation of state-of-the art clinical, research, and educational programming. At the local, state, and national levels, the faculty have presented over 50 continuing education presentations throughout the year. In AY18 the College's continuing education office worked with the other professional schools at OHSU to launch the first OHSU Interprofessional CE event. Under the heading of 'Current Issues in Healthcare', specific topics covered included *Gender Identity Diversity in Healthcare*, *Cannabinoid Concerns* and *Refugee and Immigrant Health in Oregon*. Several College faculty contributed to the lectures and panel discussions.

In the process of initiating the self-study for upcoming reaccreditation of the PharmD program in 2019, alumni across all practice settings have accepted invitations to participate in an evaluation of the professional program. The alumni and other professional stakeholders continue to be strongly supportive as preceptors and advisors for student professional development and public health outreach activities.

In AY18, student participation in community health outreach was at an all-time high. Examples of student impact include:

- 99 student-led patient care events, including events specifically targeted to underserved populations, such as Health Equity week, and Chinese and Vietnamese New Year events
- 11,500 individuals immunized, including primary support for the meningococcal B mass vaccinations conducted by the OSU Student Health Center and Student Services.
- 566 blood glucose readings and 438 blood pressure readings
- nearly 400,000 individuals reached through various types of media outreach

The Experiential Programs office entered into a partnership with St. Joseph Health Medical Group in Humboldt County, CA to help introduce more clinically trained pharmacists into ambulatory care settings in this region of Northern California. In return for student support and housing, the College is working with St. Joseph's to place pharmacy students in internships and clerkships at their Humboldt County locations. This relationship builds on the long-standing interest of the College in increasing access to pharmacists in rural areas and has also led to discussions with Humboldt State University in Arcata, CA to extend the Early Assurance Program to their pre-pharmacy students. This would be the first extension of the program to increase applicant pipeline outside of Oregon.

Faculty groups are active in hosting scientific meetings that elevate national and international awareness of research programs in the College and OSU more broadly. In July 2017, the medicinal chemistry and natural products group organized the American Society for Pharmacognosy meeting in Portland. This is the premier annual international natural products meeting and was attended by over 425 scientists and students from across the globe. Faculty in the Pharmaceutics discipline are hosting the Nanotechnology and Drug Delivery Symposium (NanoDDS) in Portland this summer. This international meeting will bring nearly 200 researchers working in cancer drug delivery technology to our campus in Portland and showcase the exceptional facilities and our productive partnerships with the OHSU Knight Cancer Institute.

Faculty participate in numerous regional, national and international pharmacy, scientific and medical specialty organizations, serving in leadership roles, as journal editors and as reviewers for publications, grant applications, and promotion dossier reviews. Ten faculty served on NIH study sections in AY18.

The University recognized four Pharmacy students as part of the new Global Awareness campaign. Two of those students are actively working to reinvigorate participation of our students with the International Pharmacy Student Federation (IPSF).

Faculty grew participation in a variety of international partnerships. New collaborative relationships were established with the University of Tanjungpura and the University of Lampung, both in Indonesia. Scholar exchanges have begun and Dr. Taifo Mahmud visited both universities as part of the Indonesian Diaspora Network mission to build human resources in Papua and West Papua. Dr. Fred Stevens was a visiting lecturer in Belgium and also hosted international scholars from Germany, France and Japan. Dr. Kerry McPhail received a prestigious new grant from the Gordon and Betty Moore Foundation to support an international collaboration among researchers from OSU, UC San Diego, University of Wisconsin and Rhodes University, South Africa. Other active research collaborations are ongoing with scientists in Brazil, Panama, England, the Netherlands, Finland, Japan, Indonesia, India, Russia, and Saudi Arabia.

**5. Diversity and Inclusion:** *Discuss the college's accomplishments on the shared goal of advancing diversity and inclusion at OSU, especially related to increasing the diversity of faculty, staff and students.*

To ensure a full and diverse cohort of qualified PharmD students every year we continue efforts to better promote our program and the profession of pharmacy to pre-college and college students. New marketing strategies emphasize advantages of our OSU/OHSU program, highlight opportunities for members of underrepresented groups, and outline myriad PharmD career paths. In order to more effectively target students that meet our academic standards and advance our diversity goals we hired a full-time recruiter in AY18. Their initial effort will focus on the development and implementation of an updated communication, marketing and recruiting strategy including online content and social media presence. Target audiences will include high school and undergraduate students and influencers such as parents, high school counselors, and academic advisors. The new recruiter will engage with low-income, first-generation in college and racially/ethnically/culturally diverse applicants to ensure we maintain inclusive and diverse cohorts. This summer, the recruiter will attend the International Leadership Conference for HOSA, an international organization focused on development and recruitment of underrepresented minorities to health profession careers. Our participation will distinguish OSU as one of only a handful of Colleges of Pharmacy engaging at this level.

The College annually sends a representative to the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) meeting to staff a recruiting booth and provide information on both the PhD and PharmD programs and answer questions about pharmacy and biomedical research careers.

As one of the five health profession schools at OHSU, the College of Pharmacy joined an effort to enhance opportunities for Native American students in health professions. An application submitted to the Health Resources & Services Administration (HRSA) seeks to establish a Health Careers Opportunity Program (HCOP) in partnership with 43 tribes, the NW Portland Indian Health Board and Washington State University College of Medicine. The proposal outlines a program providing academic enrichment activities at the high school, undergraduate, and health professional stages. If the application is successful, an HCOP Ambassador program will be started consisting of an interprofessional cohort of 25 students per year who will receive additional enrichment to better prepare them to be competitive applicants who meet the requirements of admission to the participating professional programs.

Through the College's Diversity Committee, we continue to provide financial support of *OnTrack OHSU!* and make pharmacy student volunteers available. This engagement program reaches into socioeconomically disadvantaged and culturally-diverse neighborhoods in Portland and rural Oregon to provide students in grades 6-12 the chance to explore the sciences and health professions.

**6. Faculty and Staff Development and Support:** *Discuss the college's efforts to provide professional development opportunities for its employees; to mentor its tenured, tenure-track and non-tenure track faculty; and to support the work-life balance of its employees.*

Last year, the college supported two faculty members to complete training offered by the National Center for Faculty Development and Diversity. The College also provided funds for four faculty to utilize an external grant writing coach for proposal development. Support for grant and manuscript editing is also made available to faculty as needed. All junior faculty have formal, three-person mentoring committees that meet twice per year.

Professional faculty and staff are encouraged to take coursework and seminars offered on campus to keep them current with the various changes in OSU operational systems, such as new data management systems. Staff have also been supported to attend training sessions to improve their mastery of software packages specific to managing the logistics of organizing and monitoring student placement and progress in our large experiential program. A new office specialist was added to the staff at the Corvallis campus to help manage a growing workload related to the graduate program, student services and faculty support.

The Assessment office regularly offers faculty and staff development activities through faculty meeting agenda items and coordination with programs offered at OSU and OHSU.

The College continues to help underwrite attendance at professional meetings for clinical and instructional faculty who do not have access to external grant support to assist with opportunities to improve their abilities and remain engaged in professional networks.

**7. Resource Stewardship: *Discuss the college's efforts to steward resources wisely, enhance support to faculty and students through effective administration, and grow resources through philanthropy.***

The college strives to extend its resources by working with other units at OSU, OHSU and external partners to share faculty support and expand cross-discipline research. As noted above, two new faculty members holding split positions joined the Department of Pharmaceutical Sciences last year and both highlight efforts to leverage resources. A recruitment in the College of Earth, Ocean and Atmospheric Sciences provided an opportunity to hire Dr. Kevin Brown as a spousal recruitment. Dr. Brown will have a joint appointment with the School of Chemical, Biological and Environmental Engineering. This is the first shared appointment between Pharmaceutical Sciences and Bioengineering. In January 2018, Dr. Maude David joined OSU as the final hire in the Bioinformatics and Genomics (BIG) Initiative – a collaboration between the OSU Center for Genome Research and Bioinformatics and the Colleges of Pharmacy, Engineering, Agricultural Sciences and Science. Dr. David holds a joint position in Pharmaceutical Sciences and the Department of Microbiology. Both of these hires support developing interdisciplinary, computational biosciences research and education across OSU and help form a cohort of researchers in Pharmaceutical Sciences with expertise in computer modeling and big data analysis.

Several faculty in the Department of Pharmacy Practice are supported in part by external partnerships. Half of the support for two clinical faculty in Corvallis is provided by Samaritan Health Systems, where they provide clinical services and precept students. OHSU provides partial support for three faculty members at the Portland campus; one is an ambulatory care specialist with a practice at OHSU's Richmond Clinic in Southeast Portland and two are clinical faculty fulfilling an in-patient service in Family Medicine.

Philanthropic giving and foundation and corporate investment totaled nearly \$1.7M last year, continuing the growing trend of increasing private investment to support the education and research missions of the college.