

March 2021

MESSAGE FROM THE DEAN

Dear Friends and Colleagues,

More vaccines are on the way, the days are getting longer, and we are more than two-thirds of the way through this academic year. Though it's been a challenging year, the clouds seem to be parting and there are many reasons for us to be cautiously optimistic!

First and foremost, congratulations to [Associate Professor Darrell Jackson](#) on receiving the Martin Luther King Jr. Distinguished Service Award. Each year, WSU recognizes an individual who continues the work of Dr. Martin Luther King Jr. Darrell has demonstrated altruism and community service, advancement and diversity, and education and inclusion through his work as a teacher and mentor to our students. I know from student feedback that he has been a great advisor to many, and we are delighted to share this news with our community.



Also, in keeping with the good news, congratulations to [Associate Professor Kim McKeirnan](#) and [Vice Dean Linda Garrelts MacLean](#) who were quoted in the [New York Times](#) and [CBS News](#) article for their work around pharmacy technician immunization training across the country and beyond. The article and WSU was even noted in this year's keynote at the AACP interim meeting. What began as a pilot project in 2016, has now flourished into a nationwide race to make pharmacies one of many distribution points for the COVID-19 vaccine. Thanks to our partners at APhA, [who have since adopted the training early last year](#), over 30,000 pharmacy technicians have been trained. Kim and Linda's work has helped WSU CPPS gain national recognition in how we have pioneered this program, and we could not be prouder. The articles describe an expanding job market for pharmacists with many companies offering signing bonuses. Our college has been no exception to this. In the last few months, we've seen signing bonuses and recruiters coming through our jobs board on a daily basis seeking the expertise of our students and alumni.

Our student pharmacists continue to make strides in the ongoing fight against COVID-19. Many of our students and alumni have been featured on a weekly basis in the mass vaccination effort taking place across the country. The most recent piece was on Spokane's local station [KREM2 News](#), where [Rochelle Taicz](#), a second-year student pharmacist, truly embodies the Cougar pharmacist spirit: "I really love my patients and it's great being able to do this and get hands-on experience." You can visit our website to see regular updates on how our community continues to [make a difference on the frontlines of the pandemic](#).

I am proud that during these dark times, our community of Cougar pharmacists has shone the brightest. I don't want to minimize the challenges that we have faced as a college this year. Our students have had to juggle jobs, virtual learning, and supporting their families. To help them continue to grow as pharmacists, scientists, and future health care providers, I have created [Club 1891 Dean's Circle](#) to support our students and college during these difficult times. Our student stories on the frontlines are published [daily on Instagram](#) and truly what inspires me to

ensure they have all the support they need. To learn more about how you can help our students, and build on our college's legacy, [visit our website here](#).

Thank you all for another great month in the books as we make history together!

Sincerely,



Mark Leid, Professor and Dean
WSU College of Pharmacy and Pharmaceutical Sciences

Top Stories

How summer on the lake may impact your liver

As the weather warms, daydreams of summer set in; the sounds of birds chirping, the smell of freshly mown grass, the feel of a cool swim on a warm day. But as the flowers begin to bloom so do algae unleashing a green scum across bodies of water and toxins that can affect the health of anyone exposed to too much.

Microcystin-LR is the most common and the most potent toxin produced by freshwater blue-green algae. It was first identified as a potent liver toxin in the 1980s and has since been linked to liver damage and cancer. Today, levels of the toxin are monitored in drinking and recreation waters for a designated maximum amount that people can safely ingest known as a tolerable daily intake value.

“It’s ubiquitous, every continent in the world has algae,” said Pharmaceutical Sciences Assistant Professor John Clarke. “We’re trying to assess whether individuals living with liver disease may be at greater risk.”

Clarke recently received an Outstanding New Environmental Scientist (ONES) grant from the National Institute of Environmental Health Sciences (NIEHS) of \$2.1 million over the next five years to further his research into how exposure to microcystin may contribute to the progression of nonalcoholic fatty liver disease (NAFLD)—a condition characterized by the accumulation of extra fat in liver cells.

“We often talk about the hits that the liver takes that drive the progression of [NAFLD],” said Clarke, explaining that his research team is looking into how microcystin may act as one of these “hits” driving the disease forward and possibly predisposing the liver to cancer later on. His research will help determine whether the designated tolerable daily intake value of microcystin should be different for those living with NAFLD.

■ “You don’t just get cancer overnight, it’s small changes that happen over time”

NAFLD is the most common chronic liver disease in the United States and estimated to affect approximately 25% of people worldwide. While the condition begins as an accumulation of fat in the liver, it can progress through several stages where the liver becomes inflamed (known as nonalcoholic steatohepatitis or NASH) and eventually causes fibrosis—a buildup of scar tissue in the liver.

Clarke explained that fibrosis is a natural part of the liver’s repair processes after toxin exposure. In a healthy liver, once the toxins are removed, the liver repairs itself, reversing the fibrosis.

Previous research out of Clarke’s lab found that when a healthy liver was exposed to microcystin it caused fibrosis, which then repaired itself. However, when a NAFLD liver was exposed to the same toxin the fibrosis stayed.



Pharmaceutical Sciences Assistant Professor John Clarke

When fibrosis becomes very severe and permanent, the liver disease has progressed to a stage known as cirrhosis. Both fibrosis and cirrhosis increase the risk of developing hepatocellular carcinoma, the most common type of primary liver cancer.

“You don’t just get cancer overnight, it’s small changes that happen over time,” said Clarke.

The concern is that microcystin causes some of these small changes that given time may lead to cancer.

Clarke explained, “When we looked at the comparison of healthy livers to those with NASH we saw a lot of cancer-related genes that had changed after exposure to microcystin.”

The most common exposure to microcystin is through drinking water, especially when taken from surface water. In 2014, microcystin levels in some parts of Ohio exceeded tolerable daily intake values after an [algal bloom in Lake Erie leading to the shutdown of the water supply to more than 400,000 people](#).

Even when drinking water is treated, it is often done so by killing off all algae which can in turn release more microcystin into the water. Other avenues of exposure can come through accidental ingestion while swimming, or through eating fish and shellfish that have been exposed to the toxin.

“I hope that my research will help people better understand how our environment impacts our overall health,” Clarke said.

New York Times cites WSU on growing demand for pharmacists and technicians

Vice Dean of External Relations Linda Garrelts MacLean started seeing a growing demand for pharmacy students in April 2020, just two months after the COVID-19 pandemic officially kicked off in the US. First came the requests by public health officials for students to help at COVID-19 testing sites. Soon, the need for student pharmacists and their skills in being able to communicate with patients and knowledge in administering vaccines became a bright spot in a very challenging year of virtual learning.

“We are receiving requests from pharmacies and providers, big and small, for our students. They know our students have the skills they need to communicate knowledgeably about the vaccine and other medications as well as administer the vaccines themselves,” said Garrelts MacLean.

We are receiving requests from pharmacies and providers, big and small, for our students. They know our students have the skills they need to communicate knowledgeably about the vaccine and other medications as well as administer the vaccines themselves.

Garrelts MacLean, along with Associate Professor Kimberly McKeirnan were recently featured in a [New York Times article on the pharmacy hiring spree](#) taking place across the nation. McKeirnan, who authored immunization training for pharmacy technicians, says that demand for the course has skyrocketed in the past year.

“The training has been a game changer for pharmacies,” said McKeirnan.

In the three years since the training was developed in 2016, McKeirnan instructed around 650 pharmacy technicians; in the past year, that number has grown exponentially to more than 10,000 since the training was adopted a year ago by the [American Pharmacists Association](#).

“This pandemic has been very difficult for our students on so many levels, but I’ve seen many of them turn this challenging time into a very positive experience, putting what they’ve learned into motion,” said Associate Dean for Professional Education Jennifer Robinson.

Though students have had to quickly adapt to learning from home, many have taken this once-in-lifetime pandemic and turned it into a learning opportunity.



Associate Dean Jennifer Robinson poses with a group of volunteer pharmacy students she precepted during a COVID-19 immunization clinic to vaccinate health care workers.

“This has been the most rewarding experience of the entirety of my pharmacy education. Being able to feel the sense of community has changed my perspective on health care forever and I will utilize all the knowledge I’ve gained,” said third-year pharmacy student Shannon Patterson, Chair of the American Pharmacist Association Academy of Student Pharmacists Operation Immunization.

Patterson and a group of WSU pharmacy students began vaccinating frontline health care workers in late January at the Summit Cancer Centers in Spokane, Washington. Since then, students at the college have volunteered their time at mass vaccination sites across the state and country.

“It’s really cool that we are able to be a part of this vaccination clinic. I don’t know if we will have a chance like this ever again,” said Crystal Lewis, a third-year pharmacy student at the college.

For fourth-year pharmacy student Breanna Byrne, the pandemic has been a matter of being in the right place at the right time. Though still months away from graduating with her Doctor of Pharmacy degree, Byrne has already received a full-time offer at a large community pharmacy.

“There are tons of job postings online,” said Byrne. “For a while, there was a very negative attitude around job prospects and the future of pharmacy and I always kept a positive attitude and look what happened. Right now we are seeing the big push for the importance of pharmacy in the health care team.”

Use of goldenseal may compromise glucose control in diabetics on metformin

By Judith Van Dongen, WSU Health Sciences Spokane Office of Research

Originally published in the [WSU Insider](#) February 8, 2021

SPOKANE, Wash. – Diabetic patients taking the natural product goldenseal while taking the prescription drug metformin may be unwittingly sabotaging their efforts to maintain healthy blood glucose levels. This concern arose from a [recent study published in the journal *Clinical Pharmacology & Therapeutics*](#).

Metformin—the world’s most-prescribed oral glucose-lowering medication—was included in a cocktail of selected drugs given to participants in a clinical study led by scientists at Washington State University’s College of Pharmacy and Pharmaceutical Sciences. The study sought to determine the impact of goldenseal on specific drug transporters, proteins that facilitate absorption or expulsion of drug molecules in different tissues such as the intestine, liver and kidney.

After six days of taking goldenseal, participants had about 25 percent less metformin in their bodies, a statistically significant change that could potentially impact glucose control in patients with type 2 diabetes.

“After six days of taking goldenseal, participants had about 25 percent less metformin in their bodies, a statistically significant change that could potentially impact glucose control in patients with type 2 diabetes,” said the study’s first author James Nguyen, a Ph.D. candidate in pharmaceutical sciences and recent Doctor of Pharmacy graduate. He said the finding serves as a caution to health care providers and patients that over-the-counter natural product use can lead to unwanted drug interactions, which may lead to negative health outcomes.

Unstable glucose levels increase patients’ risk of serious health complications, such as heart disease, kidney disease and infections. Adding to that concern, Nguyen said there are reports that diabetic patients are increasingly using goldenseal and berberine—a substance found in goldenseal—to self-treat their condition, likely based on claims that berberine helps lower glucose levels.

A perennial herb native to North America, goldenseal is often combined with Echinacea, a top-selling botanical product, in herbal remedies used to self-treat the



Third-year pharmacy student Shannon Patterson administers the first dose of the Moderna COVID-19 vaccine on a health care worker.



James Nguyen, who conducted the goldenseal research, is a PhD candidate and WSU Doctor of Pharmacy graduate.

common cold and other respiratory tract infections. Goldenseal is also commonly used to self-treat digestive issues such as diarrhea and constipation as well as rashes and other skin problems.

ESTABLISHING BEST PRACTICES

Goldenseal is one of several natural products being studied by the researchers as part of the National Institutes of Health-funded Center of Excellence for Natural Product Drug Interaction Research, a WSU-led, multidisciplinary effort to develop standardized approaches for studying interactions between natural products and pharmaceutical drugs.

Senior author and center principal investigator Mary Paine—a professor in the WSU College of Pharmacy & Pharmaceutical Sciences—noted that while the Food and Drug Administration and other regulatory agencies have well-established guidelines for studying potential interactions between drugs, no such guidelines exist for natural product-drug interactions. This gap exists because, unlike drugs, natural products are not required to be tested for potential drug interaction risks prior to entering the market.

“Our work in this goldenseal study helps lay the foundation for establishing best practices for studying these interactions, with a particular niche in transporter-mediated interactions,” Paine said.

STUDY TESTS MODEL PREDICTIONS

One of the overarching goals of this recently published study was to determine whether established FDA basic mathematical models for predicting transporter-mediated drug-drug interactions could be used to successfully predict natural product-drug interactions. To find out, the researchers partnered with a contract research organization to conduct test tube experiments to determine whether a goldenseal extract inhibited any of 15 different transporters. Data from those experiments were then incorporated into the models to predict whether goldenseal interacts with any of the drugs included in a drug cocktail slated to be used in the subsequent clinical study. The cocktail included low doses of three different drugs known to be transported by various transporters: furosemide (a diuretic), rosuvastatin (an anti-cholesterol drug), and metformin. The drug midazolam (a short-acting sedative) was included in the cocktail as a positive control, or a drug known to interact with goldenseal. Goldenseal inhibits the metabolic enzyme that breaks down midazolam, leading to increased midazolam in the body.



Mary Paine, professor at the WSU College of Pharmacy and Pharmaceutical Sciences, is the principal investigator and senior author for the goldenseal research. She also leads the team of investigators at the Center of Excellence for Natural Product Drug Interactions.

Finally, they conducted a clinical study with 16 healthy participants to see if their predictions held up. Participants were given just the drug cocktail during the baseline phase. In the goldenseal exposure phase, participants took goldenseal three times daily for five days before being given the drug cocktail and another dose of goldenseal on day six, followed by two more doses later that day. Blood and urine samples were collected at regular intervals after participants took the drug cocktail and analyzed by the researchers to compare how each drug moved through the body with or without exposure to goldenseal.

Based on their model predictions, the researchers expected to find an interaction between goldenseal and rosuvastatin in the clinical study, but it did not materialize. Surprisingly, the clinical data showed that taking goldenseal along with metformin decreased metformin blood concentrations, which the model predictions did not reveal.

These findings will help the researchers refine these models to increase prediction accuracy of future natural product-drug interaction studies. As follow-up to the research, Nguyen plans to conduct studies to determine the mechanism by which goldenseal alters metformin absorption. Based on the data, he said that this appears to happen in the intestine and may be driven by the transporter OCT1. This research could eventually lead to the discovery of other natural product-drug interactions involving goldenseal and drugs transported by OCT1.

In addition to researchers at WSU, the team includes scientists from the University of North Carolina at Greensboro, the University of Washington, the University of Pittsburgh and SOLVO Biotechnology.

The study was funded by the National Center for Complementary and Integrative Health U54 Center Grant for Natural Product-Drug Interaction Research, U54-AT008909.

A NOTE FROM LINDA GARRELTS MACLEAN

Dear Friends and Colleagues,

Though we are well into the second half of the academic year, the need for student support has never been greater. Many of our students continue to volunteer their time to help with vaccination efforts across the state and country despite having to juggle virtual learning, family responsibilities and more. Working with the National Guard, health care providers, and pharmacies, our students are mobilizing resources and helping to set-up mass COVID-19 vaccination clinics.



As a show of gratitude for their services and time, please support our students for [CougsGive on April 14](#). This is a one-day fundraising event dedicated to expanding, sharing, and celebrating the impact of donor support at Washington State University. As a donor, you will support our students as they continue to work with our communities where they are visibly making an impact to help put an end to this pandemic. While we are still several weeks away from CougsGive, you can help by signing up to [become a Cougar Ambassador](#) and amplifying our call to action via email, social media, or by word of mouth with friends and family.

Thank you to our generous donors who continue to help us attract the best and the brightest. We are willing to work with donors to ensure that your philanthropic vision is met. Thank you again to Dr. John Staniewski, husband of late Stephanie Staniewski, class of 1990, who established a scholarship in her memory with a major gift to the college. In addition, I'd like to share my sincere appreciation to Leon and Merrie Kay Alzola for funding their scholarship endowment. These gifts have gone on to help many students weather these challenging times.

To learn how our students continue to make a difference on the frontlines of this pandemic, [please visit our website for regular updates](#). If you want to support our students, visit our [Ways to Give webpage](#). Thank you Manpreet Chahal for [sharing your insights](#) on the importance of giving back. It rings true to the Cougar spirit, which is paying it forward to support the next generation of health care providers and scientists.

With best regards and much respect,

A handwritten signature in black ink that reads "L. Garrelts MacLean". The signature is fluid and cursive.

Linda Garrelts MacLean, Vice Dean of External Relations
WSU College of Pharmacy and Pharmaceutical Sciences

Spotlight on Success

Pharmacy's Angie Stewart to lead interprofessional coalition in Yakima

By Kevin Dudley, Originally posted in the [WSU Health Sciences Spokane Extra](#)

WSU Health Sciences Spokane is pleased to announce that College of Pharmacy and Pharmaceutical Science's Angie Stewart was selected as incoming executive director for the Yakima Valley Interprofessional Practice and Education Collaborative (YVIPEC).

Currently an associate dean for WSU's Doctor of Pharmacy program in Yakima and an associate professor in Pharmacotherapy, Stewart has been an integral part of the YVIPEC since its inception, serving on various committees and leadership positions. Her experience will help build on progress made over the past few years and lead to greater impacts as the Collaborative begins its next strategic plan.



Angie Stewart, photo provided by
PNWU

The Collaborative was created by four universities in Washington's Yakima Valley about five years ago to launch a sweeping experiment in interprofessional education. The team-based approach begins in classrooms, eventually

flowing to simulation training and clinical experiences in the community. Some 20 years of research and evidence shows such collaboration improves the quality and cost-effectiveness of health care.

“Students readily buy in to the philosophy behind why interprofessional education and interprofessional practice are so important,” said Mark Leid, dean for the WSU College of Pharmacy and Pharmaceutical Sciences. “Now, these students will have the added benefit of experiencing Angie’s leadership as she builds on the innovative concepts already in place thanks to previous director Keith Monosky and the YVIPEC team, who we are grateful to.”

Stewart will continue to maintain her formal administrative and faculty positions with WSU. Monosky leaves the YVIPEC director role as he retires from Pacific Northwest University of Health Sciences (PNWU) in March. Stewart and Monosky are already working on transitioning roles.

In addition to WSU pharmacy students, YVIPEC also includes nursing students from WSU; osteopathic medical students from PNWU; public health, paramedic and dietitian students from Central Washington University; and nursing and physician assistant students from Heritage University.

Said Stewart, “Having four universities involved in YVIPEC makes the collaboration unique among the growing number of interprofessional education programs. Students across the board want to work as part of a team, particularly when they know teamwork will help them better take care of their patients in the future.”

Stewart received her BS in pharmacy from the University of Washington and her PharmD from the University of Texas, Austin and University of Texas Health Science Center, San Antonio (UTHSCSA). She completed a PGY1 residency at St. Joseph Hospital in Tacoma and a specialty residency in adult internal medicine at the UTHSCSA and Bexar County Hospital District in San Antonio.

She is a board-certified Pharmacotherapy specialist with more than 30 years of experience caring for patients and precepting students. Her precepting happened within multiple inpatient and ambulatory care teams at Yakima Valley Memorial Hospital where she served as residency director and clinical pharmacy supervisor.

She is a two-time board member and past president of the Washington State Pharmacy Association and remains active in the association locally and on the state level. Stewart teaches throughout the PharmD curriculum in courses including politics, leadership, management, and medication safety. Her current research interests center around interprofessional education and the scholarship of teaching and learning.

Please join us in congratulating Stewart on this achievement!

Provost’s Featured Faculty virtual recognition

Yakima Pharmacotherapy Assistant Professor Christina Buchman was selected as one of the 2020-21 Provost Featured Faculty for her outstanding contributions to the College of Pharmacy and Pharmaceutical Sciences and the University as a whole. Honorees embody the tremendous teaching and mentorship that are trademarks of WSU faculty members across the University. She and other 2020-21 featured faculty were recognized during a virtual event on Wednesday, February 24, 2021.

Watch the video: youtu.be/FvN5AzHScww?t=940

COVID-19 Response Recruitment – Medical Reserve Corps of Eastern Washington

Are you a pharmacist who is retired or has free time to make a real difference in your community? In light of the COVID-19 pandemic, the biggest potential challenge that health care faces is low staffing. In the coming months, there may be an increased need for trained, qualified individuals to help with vaccination efforts and provide support in the event of a surge in cases that strains our hospital systems. Sign up to be part of the Medical Reserve Corps of Eastern Washington.

Learn more or apply to volunteer: bit.ly/2PC0pfE



PHILANTHROPY FOCUS

Everett Gibbons, class of 1956, and his wife, **Dolly**, recently reached a major milestone of philanthropy: 50 years of giving to the College of Pharmacy and Pharmaceutical Sciences! Everett, who owned Gibbons Pharmacy in Toppenish, is part of what will soon be a three-generation of pharmacy alumni at the college. His son, **Greg Gibbons** graduated in 1982 and now is the owner of Gibbons Pharmacy as well as three other independent pharmacies in the Yakima, Washington area. Everett's grandson and Greg's son, **Seth Gibbons**, is currently a PY3 at the CPPS. Congratulations to the Gibbons family, and on behalf of the college, please accept our heartfelt gratitude for your generosity.

Alumni News

Skye McKennon, class of 2007, returned to Spokane two years ago to be closer to family after faculty positions at the University of Washington and the University of Utah, where she taught pharmacy, medical and physician assistant students. Her practice was in the ambulatory setting for underserved patients with a particular interest in preventive medicine. Dr. McKennon and her husband, who has been practicing as a pulmonary and critical care physician at Sacred Heart, are the proud parents of a lovely daughter, aged three. Currently, Dr. McKennon is teaching part-time at both WSU and UW. At WSU, she teaches in the therapeutics course and also teaches an evidence-based preventive health elective. In addition, Dr. McKennon has been actively writing textbooks and her fifth and sixth textbooks recently went to press. Dr. McKennon also [hosts a website that promotes health and disease prevention.](#)



Skye McKennon with her family

Alice Knotts, class of 2018, has taken the reins as President of the Spokane Pharmacy Association (SPA) and is busy planning the organization's Centennial Celebration event that will take place this fall. In her career since graduating, Dr. Knotts completed a PGY1 residency program at VA Puget Sound in Seattle, then began working as a clinical staff pharmacist at St Luke's Rehabilitation Institute in Spokane, Washington. In 2020, an exciting chance to join the pharmacy team at Kootenai Health presented itself, and with encouragement from her employer St Luke's, she jumped at the opportunity to do so. She is currently working as the Kootenai Care Network pharmacist at Kootenai Health in Coeur d'Alene, Idaho. Her role involves MTM, population health, quality metric management, and a whole host of other ambulatory and administrative pharmacy projects. Prior to pharmacy school, Dr. Knotts graduated from George Fox University in Newberg, Oregon with a degree in writing and literature. She then worked as a writer for several years before changing careers to become a real estate agent and investor. In her free time, she still owns and operates a real estate investment company and enjoys a variety of activities, including freelance journalism, creative writing, reading, eating good food, socializing with friends, rock climbing, skiing, and ping pong.



Alice Knotts

Want to be listed in our alumni updates? Send us your career information or let us know what you've been up to at pharmacy.gocougs@wsu.edu!

A SPECIAL NOTE FROM FELICIA E. GASKINS

I want to thank Dean Mark Leid and Kelly Sylvester for giving me the opportunity to write a piece in the college newsletter. I know that the newsletter has a wide circulation and therefore I have an opportunity to communicate with many faculty, staff, classmates, students, and friends of Bill. I want to thank you for your many cards, letters, flowers, donations to the William and Felicia Gaskins scholarship, candy, prayers and well wishes. Thank you to so many who wrote about your personal experience with Bill. My family and I are incredibly grateful to you.

Our family is planning to hold a “celebration of life” for Bill as soon as COVID-19 restrictions are lifted, and it is safe to travel and gather. We are planning that it will take place in Pullman and we hope that many will be able to join us. Knowing that little is certain right now, we will let you know if our plans change. Above all, we want everyone to be safe and stay healthy. Thank you again from the Gaskins family.



Felicia Gaskins at the 2019 Crimson Gala where Bill was honored with the R. Keith Campbell Lifetime Achievement Award

Other News

‘It’s an access thing’: Pacific Islanders get COVID-19 shots at community clinic in Spokane

Pharmacy students recently volunteered to help eligible Pacific Islanders living in the Spokane community get their COVID-19 vaccine.

[Read more from The Spokesman Review](#)

In touch with safety: Guidelines say gloves aren’t required for COVID-19 vaccinators

To glove or not to glove? According to the CDC and Washington Department of Health, gloves are mostly not necessary to administer COVID-19 vaccines. WSU College of Nursing faculty member Kay Olson recently talked to the Spokesman Review about why WSU Health Sciences students aren’t wearing gloves when giving COVID-19 vaccines.

[Read more from The Spokesman-Review](#)

With vaccines in more drugstores, pharmacies go on hiring sprees

As COVID-19 vaccination efforts continue to gain speed around the country, pharmacies are hiring thousands of pharmacists and technicians to vaccinate customers. The New York Times talked to WSU College of Pharmacy and Pharmaceutical Sciences faculty members Linda Garrelts MacLean and Kim McKeirnan about the growing demand for pharmacists and technicians, along with the immunization training offered through a collaboration between the American Pharmacists Association and the college.

[Read more from the New York Times](#)

WSU students volunteer giving COVID-19 vaccines at Spokane clinics

KREM2 News recently stopped by Summit Cancer Care Center where they talked to second-year pharmacy student Rochelle Taicz about her experience vaccinating in the Spokane community.

[Read more from KREM2 News](#)

Pharmacy student administers COVID vaccines

During her first volunteer shift third-year pharmacy student Crystal Lewis helped vaccinate about 200 people at the Summit Cancer Care Center. She is one of many pharmacy students assisting in volunteer vaccination efforts across the state.

[Read more from the Daily Evergreen](#)

Getting the COVID-19 vaccine

Pharmacotherapy Chair John White addresses the question: I may have the opportunity to receive a COVID vaccine in a couple of weeks. Should I take it now or wait and see what happens?

[Read more from Health & Home Magazine](#)

Pharmacists are hot commodity as U.S. ramps up COVID-19 vaccine rollout

As pharmacists become a hot commodity in the US, pharmacy students across the country are finding themselves in high demand.

[Read more from CBS Money Watch](#)

Wake up with Research: COVID-19 and Vulnerable Populations

Researchers from the WSU College of Pharmacy and Pharmaceutical Sciences, College of Nursing, and Elson S. Floyd College of Medicine talked about COVID-19 and its impact on vulnerable populations.

[Watch the video](#)

Faculty Scholarship

PUBLICATIONS

United States Transuranium and Uranium Registries (USTUR) Postdoctoral Research Associate **Martin Šefl**, USTUR Assistant Professor **Maia Avtandilashvili**, USTUR Director and Professor **Sergei Tolmachev**, "[Inhalation of soluble plutonium: 53-year follow up of Manhattan project worker](#)," in Health Physics in February 2021.

Pharmacotherapy Assistant Professor **Taylor Bertsch**, Pharmaceutical Sciences Assistant Professor **Travis Denton**, Pharmacotherapy Assistant Professor **Nicole Perea (Rodin)**, Pharmaceutical Sciences Assistant Professor **Ayesha Ahmed** and Pharmacotherapy Associate Professor **Kimberly McKeirnan** published, "[Drug development and the process of transitioning to team-based learning in a qualitative way](#)," in the peer-reviewed journal Currents in Pharmacy Teaching and Learning in February 2021.

Kimberly McKeirnan and one co-author published, "[Pharmacy patient perceptions of pharmacy technicians as immunizers](#)," in the Journal of the American Pharmacists Association in February 2021.

Pharmaceutical Sciences Associate Professor **Bhagwat Prasad** contributed as a co-author in a research article "[Characterization of CYP3A pharmacogenetic variation in American Indian and Alaska Native communities, targeting CYP3A4*1G allele function](#)," from a multicenter study in Clinical and Translational Science in January 2021.

Pharmaceutical Sciences Assistant Professor **John Clarke**, Pharmaceutical Sciences Professor **Mary Paine**, Research Technologist **Katherine Lynch**, Postdoctoral Research Associate **Dan-Dan Tian** and six co-authors published "[Hepatic organic anion transporting polypeptides mediate disposition of milk thistle flavonolignans and pharmacokinetic silymarin-drug interactions](#)," in Phytotherapy Research in February 2021.

John Clarke, **Katherine Lynch** and two co-authors published "[Sub-chronic microcystin-LR renal toxicity in rats fed a high fat/high cholesterol diet](#)," in Chemosphere.

John Clarke and one co-author published "[Multi-factorial pharmacokinetic interactions: unraveling complexities in precision drug therapy](#)," in Expert Opinion on Drug Metabolism and Toxicology in January 2021.

Pharmaceutical Sciences Assistant Professor **Travis T Denton** and three co-authors published, "[The metabolic importance of the overlooked asparaginase II pathway](#)," in Analytical Biochemistry in December 2020.

Travis T. Denton and four co-authors published, "[The metabolic importance of the glutaminase II pathway in normal and cancerous cells](#)," in Analytical Biochemistry in December 2020.

Pharmaceutical Sciences Professor **Salah-uddin Ahmed**, Pharmaceutical Sciences Assistant Professor **Anil K. Singh** and one co-author published, "[Guanylate Binding Protein 5 \(GBP5\) regulates synovial fibroblast mediated inflammation and tissue destruction in rheumatoid arthritis,](#)" in Arthritis and Rheumatology in December 2020.

PRESENTATIONS

J. Roberts and Marcia Fosberg Distinguished Professor of Pharmacotherapy **Danial Baker** led a webinar titled, "Policy and practice issues in the USA," for the United Arab Emirates Ministry of Health Pharmacists at Gulf Medical University in Ajman, United Arab Emirates on February 4, 2021

Kimberly McKeirnan and two others participated in the WSU Wake Up with Research panel titled, "[COVID-19 and Vulnerable Populations,](#)" on February 24, 2021. The presentation reviewed COVID 19 in high risk communities including the Marshallese, testing and immunization outreach, and vulnerability index and detection of the virus in wastewater.

Danial Baker led a webinar titled, "Quality of Evidence," for the Evidence-Based Practice and Interprofessional Care (EBP-IPC) Certificate Course at Gulf Medical University in Ajman, United Arab Emirates on February 26, 2021.

SERVICE

Allen I. White Distinguished Associate Professor in Pharmacotherapy **Joshua Neumiller** served as a Course Director for the American Diabetes Association's (ADA's) Virtual 68th Advanced Postgraduate Course from February 3-7, 2021. Additionally, he chaired and moderated four sessions during the meeting:

- 2021 ADA Standards of Care Updates
- Update on the Management of Diabetic Kidney Disease
- Current and Future State of Blood Glucose Monitoring
- Panel Discussion: Management of Type 2 Diabetes in Complex Patients: A Multi-specialty Discussion

Josh Neumiller has been appointed to the American Diabetes Association's FDA Advisory Working Group. This is a new council of experts convened by the ADA to advise their work with the U.S. Food and Drug Administration.

Vice Dean of External Relations **Linda Garrelts MacLean** and **Kimberly McKeirnan** were cited in the New York Times article, "[With vaccines in more drugstores, pharmacies go on hiring sprees,](#)" about the booming pharmacy job market.

GRANTS & AWARDS

John Clarke received an Outstanding New Environmental Scientist (ONES) grant of \$2,132,242 over five years from the National Institute of Environmental Health Sciences (NIEHS) for a research project titled, "Mechanisms of microcystin-induced hepatocellular carcinoma in nonalcoholic steatohepatitis."

Student Achievement

DOCTOR OF PHILOSOPHY (PHD) STUDENTS

Baron Bechtold (Clarke lab) with faculty co-author **John Clarke** published "[Multi-factorial pharmacokinetic interactions: unraveling complexities in precision drug therapy,](#)" in Expert Opinion on Drug Metabolism and Toxicology in January 2021.

Tarana Arman (Clarke lab) with faculty co-author **John Clarke** and two other co-authors published "[Sub-chronic microcystin-LR renal toxicity in rats fed a high fat/high cholesterol diet,](#)" in Chemosphere.

Tarana Arman (Clarke lab), **Victoria Oyanna** (PharmD/PhD, Clarke lab) and **Baron Bechtold** (Clarke lab) with faculty co-authors **John Clarke** and **Mary Paine** and five other co-authors published "[Hepatic organic anion transporting polypeptides mediate disposition of milk thistle flavonolignans and pharmacokinetic silymarin-drug interactions,](#)" in Phytotherapy Research in February 2021.

DOCTOR OF PHARMACY (PHARMD) STUDENTS

Ehsan Sedaghat (class of 2021) with faculty co-authors **Kimberly McKeirnan** and Research Fellow **Sorosh Kherghehpoush** and one other co-author published, "[Using the Patient Activation Measure during a pharmacist-led rural patient home visit pilot project](#)," in the Journal of the American Pharmacists Association in February 2021.

Emily Hitt (class of 2022) with faculty co-author Pharmaceutical Sciences Associate Professor **Sue Marsh** presented the poster, "Impact of hypothyroidism on reproductive health" at the 2020 American Society of Health-System Pharmacists (ASHP) Midyear Clinical Meeting and Exhibition; December 10, 2020.

Simarleen Kaur (class of 2021) with faculty co-author **Kimberly McKeirnan** published, "[Pharmacy patient perceptions of pharmacy technicians as immunizers](#)," in the Journal of the American Pharmacists Association in February 2021.

Kayla Leland (class of 2022) was selected as one of ten pharmacy students nationwide to receive the Independent Pharmacy Cooperative (IPC) 2020 RxScholarship Foundation scholarship.



College of

**Pharmacy and
Pharmaceutical Sciences**

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