Dynamic and challenging disciplines, such as Pharmaceutical science and Nutritional science, are committed to the promotion of health, treatment of disease and overall well-being of humans and animals. The programs at the college provide students with the essential knowledge and skills to be global professional leaders and committed to high quality patient care and innovative health sciences research.

U of S College of Pharmacy and Nutrition has immense talent, outstanding students, a great tradition and a world class reputation for research and practice innovation. Our College is well respected and known as the epicenter for pharmacy practice innovation and research excellence within Canada. It is one of the oldest pharmacy/ nutrition schools in Canada dating back to 1914. Many of the graduates over the past 100 years have gone on to be innovators, scholars, teachers, leaders, and pioneers in pharmacy-practice, research scientists in pharmacy, nutrition, biotechnology, and medicine across the globe.

Our research funding continues to increase, and we are among the top in Canada for fundraising. The promotion of graduate student interdisciplinary research training is encouraged with a high degree of excellent shared research services that include the Centre for Cyclotron Science, Canadian Light Source (the only one in Canada), world class Core Mass Spectrometry Facility, Drug Discovery and Development Research facility, Social Sciences Research Laboratories, and others.

Research Spotlight
U of S leading Interdisciplinary Cannabis Research in Canada to tackle some of the concerns such as investigating the safety and efficacy of Cannabis oil for children with epilepsy, age-stratified pharmacokinetics of cannabinoids, and further understanding the mechanism of the endocannabinoid system.

Inspirational Corner
U of S CSPS-YSN Representatives pay tribute to a legend who is the epitome of professionalism and an outstanding mentor, scientist, teacher, friend and a great advocate for the College and the University of Saskatchewan.
What is CSPS-YSN?

The Canadian Society for Pharmaceutical Sciences- Young Scientists Network (CSPS-YSN) formed at the annual CSPS conference this year in Toronto (May 2018). Additionally, at the inaugural meeting the integration of CSPS-YSN representatives with the relevant university AAPS Chapter (that currently have a student chapter) was suggested to strengthen the network. We hope that this network will bring together trainees (undergraduates, graduate students, post-docs and other lab personnel) pursuing pharmaceutical science across Canada and provide a platform where we can share success and learn from each other.

Follow us on..... Twitter @CSPS_YSN

“Young Scientists Network is a fresh, enthusiastic and ambitious group of scientists in training, providing a platform for networking, sharing science and finding mentors. It’s a creative and fun initiative which I believe everyone can benefit from.

Raj Rai, M.Sc. candidate (Pharmacy), U of S

“I believe the CSPS-YSN is a great initiative. This network will allow for stronger collaborations and more ground-breaking research among the younger generation of scientists. The importance of a strong network among scientists sharing ideas and working on projects together cannot be downplayed. More importantly, networking is imperative. I am really excited for the CSPS-YSN and future of pharmaceutical scientists.”

Omozojie Paul Aigbogun, M.Sc. candidate (Chemistry), U of S
San Diego, CA, USA
U of S AAPS Chapter members at the AAPS Annual Meeting and Exposition 2017

Saskatoon, SK, Canada
Chair: Stephanie Vuong, Chair-Elect: Mujtaba Badr,
Vice-Chair: Raj Rai, Treasurer: Saniya Alwani, Secretary:
Kingsley Nwabufo, Design and Media Officer: Paul
Aigbogun, and Past-Chair: Franklyn De Silva. Faculty
Advisors: Dr. Kishor Wasan and Dr. Robert Laprairie.

STAY CONNECTED....

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U of S College of Pharmacy and Nutrition

Website:
pharmacy-nutrition.usask.ca
Twitter: @usaskPharmNut

U of S AAPS Student Chapter

The University of Saskatchewan's (UofS) Student Chapter of the American Association of Pharmaceutical Scientists (AAPS) formed in early 2015. As a newer AAPS Student Chapter, they aim at creating a more coherent, diverse, social and scientific community at the University of Saskatchewan.

This student chapter connects students and postdoctoral fellows from different pharmaceutical backgrounds to the larger community of pharmaceutical discovery, development and manufacturing.

The chapter helps each student member share knowledge with peers and mentors from a wide variety of fields, such as biotechnology, clinical and epidemiological studies, pharmacology, toxicology, medicinal chemistry, analytical chemistry, pharmacokinetics, natural products and nutraceuticals, pharmaceutical quality as well as drug discovery and development, and pharmaceutics.

The primary target is to launch a platform where the members’ multidisciplinary expertise can meet, nourish and grow. This is best achieved through the integration of different interactive learning environments that will not only help students to grow professionally but also allow them to develop other communication and leadership skills. Workshops, seminars and discussion groups on career opportunities and current advancements in pharmaceutical sciences are organized by the student chapter. Speakers from industry are invited to talk to students about career options and how to effectively search for jobs in the industry.

Members of the AAPS Student Chapter are continuously encouraged to engage more with the activities organized by the AAPS such as the internationally recognized Annual AAPS Meeting and Exposition (PharmSci360). Undeniably this stream of activities fosters the multidisciplinary interaction and provides excellent networking opportunities that will benefit the faculty, staff, students, postdoctoral fellows and other research personnel at the University of Saskatchewan.
Upcoming Events @U of S

U of S AAPS Visiting Scientist Day

09-20-2018 | 9.00 am | HSB

Seminar: Precision Medicine
Workshop 1: Bioanalytical Method
Workshop 2: Career & Professional Development

You are invited!!!

RSVP: For more details uofs.aaps@usask.ca

“Dream Big”, is exactly what the U of S - AAPS Student Chapter did when they decided to invite Dr. Binodh DeSilva, the immediate past president and current board member of the American Association of Pharmaceutical Scientists, and Head of Analytical Strategy & Operations at Bristol-Myers Squibb (BMS) Company (NJ, USA) as the guest speaker for the 3rd Annual U of S AAPS Visiting Scientist Day, held on September 19 - 20th, 2018. The chapter executive members are excited about this two-day event, which is bigger than ever.

Dr. DeSilva received her Bachelor’s in Analytical Chemistry from the University of Colombo, Sri Lanka in 1987, and a Ph.D. in Chemistry (Bioanalytical) from the University of Kansas, USA in 1994. Prior to joining BMS, Dr. DeSilva led the bioanalytical teams at Procter & Gamble Pharmaceuticals (New York) and Amgen (California). She has been an active participant in developing bioanalytical guidance and has represented North America as a member of the Steering Committee of the Global Bioanalytical Consortium. Dr. DeSilva has extensively published topics on validation of Ligand Binding assays, use of emerging technologies to enable bioanalysis, scientific data driven decisions when validating the for regulated support and so forth.

The 6th Western Canadian Medicinal Chemistry Workshop (WCMCW)

September 21 - 23th, 2018 | University of Saskatchewan

Website: www.wcmcw.ca

Invited Speakers:
- Rebecca Davis (Manitoba)
- Kate Dadachova (Saskatchewan)
- Robert Laprairie (Saskatchewan)
- Florence Williams (Alberta)
- Darren Derksen (Alberta)
- Tim Storr (SFU)
- Katherine Maloney (Northern Vine Labs)

WCMCW Goals:
1) Provide a forum for Western Canadian researchers in the pharmaceutical sciences (medicinal chemistry, pharmacokinetics, and pharmaceutics) chemistry, biochemistry, pharmacology, toxicology and physiology to meet and learn about common interests, with the goal of establishing cross-disciplinary collaborations within and between institutions.
2) Provide training opportunities for postdoctoral, graduate and undergraduate researchers with an interest in the pharmaceutical sciences.
Trainee Spotlight
Interview - Graduate Student

Mays Al-Dulaymi

Bio:
Current Supervisors: Drs. Ildiko Badea and Anas El-Anied

Current and Previous Position(s)
• Current: Ph.D. candidate, College of Pharmacy and Nutrition, and Research Associate, Department of Pediatrics, College of Medicine, U of S
• Past: Research Assistant, Leslie Dan Faculty of Pharmacy, University of Toronto, and Community Pharmacist, Amman, Jordan

Leadership Roles:
• Graduate student representative/Community Administrator on the Steering Committee of the Lipid-Based Drug Delivery Systems Focus Group of American Association of Pharmaceutical Scientists (October 2018 - Present)
• Co-founder and Chair of the AAPS University of Saskatchewan Student Chapter (December 2014 - June 2016)
• Co-leader of the University of Saskatchewan Supervisor-Student Agreement Committee (September 2016-present)
• Graduate student representative on the Research, Scholarly and Artistic Work Committee at the University of Saskatchewan Council (May 2017 - 2018)
• Graduate student representative on the Research and Graduate Affairs Committee in the College of Pharmacy and Nutrition at the U of S (September 2014- September 2017).
• Co-founder and Chair of the Arab Students’ Association at the U of S (July 2016- present)

Education: B.Sc. in Pharmacy, Al-Zaytoonah University of Jordan, Amman, Jordan, August 2010

What made you decide to study/work at U of S College of Pharmacy and Nutrition? Why did you choose your current supervisors?
“I came to the U of S mainly due to my interest in the project itself, benefiting from the U of S state-of-the-art facilities. Also, the reputation the U of S has as a research-intensive institute where students have the chance to get an excellent training opportunity”.

Do you think that the supervisor/principle investigator play a role on the success of a trainee?
“I believe that the supervisors play an extremely important role in shaping the postgraduate experience. They not only oversee the project and provide you with feedback; but they also motivate you when your experiments fail, challenge you when you become ‘too confident’ and help steer you towards making a wise career choice”.

As a trainee, what can you do to prepare for a successful career?
“In today’s competitive multidisciplinary job market, I try to focus on becoming a “well-rounded” trainee. While I spend a great amount of time working on my project and expanding my scientific knowledge, I try to focus on improving my interpersonal and leadership skills”.

What do you enjoy most about your job/project/grad-life?
“The hope is that my research could contribute even slightly to the wellness of someone life in the future. Also, the idea of being challenged and the excitement of cracking a puzzle is my daily fuel”.

As a trainee, what skills do you think are essential to be successful in grad-school?
“It is hard to pin point one golden trail that will make you successful in grad school but having a diverse skill set will do. Essential skills could include problems solving, strong communication skills, time management, self-advocacy and persistence. I also find the quality of being proactive by taking responsibility of your own experience is a foundational characteristic of a successful student”.

Mays Al-Dulaymi
Her research project focuses on the development and characterization of gemini surfactants-based formulation for cutaneous gene delivery. She also utilizes mass spectrometry to track the fate and distribution of the topically applied formulations. The development of efficient and safe gene delivery system could in theory revolutionize the way we treat diseases. Currently, the health systems worldwide are burden with more than 500 genetic disorders that do not have a cure. An example of such diseases is melanoma, a highly aggressive type of skin cancer. In fact, the Canadian Cancer Statistics reported over a thousand death cases caused by melanoma alone in 2017, making melanoma the deadliest form of skin cancer.

Highlights: Recipient of the Gattefossé Canada/CSPS Award in Lipid-Based Drug Delivery at the annual CSPS conference (Montreal, 2017), and the AAPS Graduate Student Research Award in Drug Discovery and Development (San Diego, 2017)

Mona Hamada
Her project focuses on developing liquid chromatography-mass spectrometric methods to quantify selected metabolites in urine of asthma and COPD patients. Preliminary studies had demonstrated the diagnostic potential of these metabolites. She further stated that “we need robust analytical methods to verify their clinical usefulness as biomarkers”.

Highlights: Recipient of the 56th Eastern Analytical Symposium Student Research Award in Analytical Chemistry.
Kingsley Nwabufo

His research interest is on drug disposition and bioanalysis. Recently, his laboratory has discovered novel dimer compounds that have the potential to prevent the death of dopamine-producing neurons. His research is focused on these compounds. To accomplish this he will determine the metabolic stability of novel compounds in liver microsomes, identify metabolites of these compounds using accurate mass measurement and tandem mass spectrometry (MS), elucidate the MS fingerprint of these compounds, develop and validate a reverse phase HPLC method for the quantitative analysis of these compounds in microsomes, and determine the enzyme kinetic parameters of these compounds.


Mona Hamada (Khamis)

Bio-

Current Supervisors: Drs. Anas El-Aneed and Darryl Adamko

Current and Previous Position(s)
- Current: Ph.D. candidate (5th year), College of Pharmacy and Nutrition, U of S
- Past: Prior to U of S, she was a research assistant during her Master’s program, involved in developing analytical methods for quality control purposes of pharmaceutical formulations

Leadership Roles:
- Co-founded the U of S AAPS Student Chapter and the College of Pharmacy and Nutrition Graduate Student Council

What made you decide to study/work at U of S College of Pharmacy and Nutrition? Why did you choose your current supervisors?
“The college has a top-notch mass-spectrometry core facility and is also well known for its society of analytical experts. As such, I was eager to join this prestigious institution to pursue my PhD degree”.

What do you enjoy most about your job/project/grad-life?
“My experience here has been outstanding and my efforts have been always appreciated through various awards”.

Do you think that the supervisor/principle investigator play a role on the success of a trainee?
“Besides my research work, my supervisors have been encouraging me to develop my professional and leadership skills”.

As a trainee, what skills do you think are essential to be successful in grad-school?
“I believe that the engagement in extra-curricular activities is integral to the professional growth of graduate students as future scientists and global citizens of the community”.

Chukwunonso Kingsley Nwabufo

Bio-

Current Supervisor: Dr. Ed Kro1

Current Position: M.Sc. candidate, and Teaching Assistant at the College of Pharmacy and Nutrition, University of Saskatchewan

Leadership Roles:
- Current: Secretary, U of S AAPS Chapter, and Graduate Student Reviewer, University of Saskatchewan Undergraduate Research Journal
- Past: Director of Welfare, National Society of Biochemistry Students, University of Benin Chapter, Nigeria, and Coordinator, Creative Writers Association of Nigeria, Edo State Chapter, Nigeria

Education: Graduate Professional Skills Certificate, University of Saskatchewan, and BSc Biochemistry (First Class Honors), University of Benin, Nigeria

What made you decide to study/work at U of S College of Pharmacy and Nutrition? Why did you choose your current supervisor?
“The college provides an excellent opportunity for graduate students to conduct translational research that can potentially enhance the health of people all over the world. I chose my current supervisor because our research interest is similar. Additionally, Kro1’s laboratory is equipped with state-of-the-art facilities that are essential for conducting research in drug discovery and development”.

Do you think that the supervisor/principle investigator play a role on the success of a trainee?
“I believe that the principal investigator plays a crucial role in the success of a trainee. This is because the PI has both the experience and expertise that is essential for the success of the trainee”.

As a trainee, what skills do you think are essential to be successful in grad-school?
“Time management is a very important skill for a successful graduate school experience. Additionally, excellent intrapersonal and interpersonal skills are valuable for success in graduate school and beyond”.

As a trainee, do you think ethics and integrity play a role in one’s career?
“Yes, ethics and integrity play an essential role in one’s career. As a researcher, it is important to maintain research integrity because it leads to trust, and trust is at the core of research practice”.

What advice would you give to students interested in enrolling in the pharmacy graduate program?
“The pharmacy graduate program provides an excellent opportunity for you to partake in improving the health and well being of people all over the world. Seize the opportunity and dare to make a difference!”.
Stephanie Vuong

Bio-
Current Supervisor(s): Drs. Jane Alcorn, and Andrew W. Lyon

Current Position(s)
M.Sc. candidate and Research Assistant at the College of Pharmacy and Nutrition, U of S

Leadership Roles:
• Current: Chair, U of S AAPS Chapter, and CSPS-YSN U of S Representative (2018 - 2019)
• Past: Toxicology Student Society Fundraising Director, U of S (2016 - 2017)

Education: BSc (Honors) Toxicology, U of S

What made you decide to study/work at U of S College of Pharmacy and Nutrition? Why did you choose your current supervisor(s)?

“I started in toxicology, completing my honour’s project on Cannabis with Dr. Jane Alcorn (College of Pharmacy and Nutrition) and Dr. Andrew W Lyon (College of Medicine). Throughout my honour’s project, my interest in Cannabis research peaked, to the point where I knew I wanted to continue in this area. Fortunately, my supervisors asked if I would like to continue working on the Cannabis study as a master’s student and that’s how I ended up here at the College of Pharmacy and Nutrition!”

What do you enjoy most about your job/project/grad-life?

“In terms of academic grad life, I enjoy expanding my knowledge and learning new things every day. It’s rewarding to know that your research may potentially have an impact in the science community. In terms of social grad life, I enjoy making new lifelong friends. You see the other students almost every day for 2-4 years, so you get to watch the progress they make in their own projects which I find is amazing. Also, the graduate students have a great community where other students are willing to provide their own expertise and support”.

Do you think that the supervisor/principle investigator play a role on the success of a trainee?

“Yes! I believe a good relationship between the trainee and the supervisor is necessary for the success of the trainee. Personally, my supervisors have given me great advice, support, and guidance throughout my program. I am comfortable enough to open up to them and raise any concerns about my project. When you have a strong relationship with your supervisor it motivates you to work harder”.

Do you have other mentors apart from your supervisor?

“Yes, I am fortunate enough to be working with Deborah Michels (Research Manager). Not only does she provide her expertise in analytical chemistry, but she also gives support to the students that she works with! I am also part of the AAPS U of S chapter so both faculty advisors, Drs. Wasan and Laprairie, have given us great advice and tremendous support while operating the chapter”.

As a trainee, what can you do to prepare for a successful career?

“I think graduate students should try networking as much as possible. Attend and present your work at conferences. This will give you the chance to connect with people who are in similar research areas as you, which can help expand job opportunities or even help you choose which career path suits you. Additionally, I believe working on improving your skills are necessary. Employers don’t solely focus on your degree or projects, but also on other experiences outside of your project. Extracurricular activities, such as joining student groups/organizations can help build leadership and communication skills while attending learning workshops can help improve your academic skills”.

Grace Cuddihy

She primarily focused on assessing the in vitro cytotoxicity of a novel lanthanide compound as a potential treatment option in bone density disorders. After determining that this compound had only limited toxicity at very high concentrations in cell lines last year, she is currently focusing on determining the compound’s ability to inhibit the differentiation of specific bone cells (osteoclasts), without interfering with the differentiation of osteoblasts.

Highlights: Recipient of the GSK/CSPS National Undergraduate Student Research Award (Toronto 2018).
Trainee Spotlight
Interview - Undergraduate Student

Grace Cuddihy

Bio:
Current Supervisors: Drs. Kishor Wasan and David Cooper

Current Position: Research assistant, Interdisciplinary Summer Research Student Award with the College of Medicine and the College of Pharmacy and Nutrition, and BSP candidate (2020) at the University of Saskatchewan

Education: B.Sc. Specialization in Biology from Concordia University, Montreal, QC

How do you enjoy most about your job/project/college-life?
“I really enjoy the process of planning experiments from start to finish. Being involved in the entire process allows me to be confident and knowledgeable about the results we have produced, which I find very rewarding”.

Do you think that the supervisor/principle investigator play a role on the success of a trainee?
“Absolutely. I believe that a supervisor has a critical role in shaping the success of their trainees, by sharing their expertise and helping trainees see what is working in their project and what needs to change. Moreover, critiquing trainees’ papers and presenting skills help us build confidence in writing and presenting our research to a wide variety of audiences. Personally, I would not have been as successful as I have been if it weren’t for the guidance of my supervisors”.

As a trainee, do you think ethics and integrity play a role in one’s career?
“Definitely without ethics, research would lose its relevance and impact. Something that is very honorable in academia is that there is an expectation that everyone is executing their research with integrity, which helps instill confidence in the findings. I try to maintain this standard by not going into studies with a priori expectations of the findings and by asking questions whenever I am unsure to ensure that I am performing experiments properly”.

As a trainee, what can you do to prepare for a successful career?

“Take advantage of every opportunity whether it be a poster presentation, conference, workshop, etc. I try to learn everything that I can from my accomplished mentors and colleagues in order to broaden my knowledge base so that I can apply what I have learnt, to my future endeavors”.

What advice would you give to students interested in enrolling into the pharmacy graduate program?
“Don’t be hesitant to pursue something that is outside of your comfort zone but that is something which you are passionate about. Being surrounded by graduate students every day has shown me that the scope of research on campus is vast and there are many opportunities to advance our degrees beyond the undergraduate level. Being a pharmacy student myself, I believe graduate work is an asset regardless of how you choose to use your training in pharmacy, whether you choose a career in regulation, manufacture, research and development, or a career as a clinician. So I encourage students to look into the pharmacy graduate program at U of S!”.

University Bridge, Saskatoon, Saskatchewan

The Bowl, U of S, Saskatoon, Saskatchewan
Pharm-Science Publications from U of S - Selected

- Davies, N.M. and Wasan, KM. 2018. Pharmacokinetics and Drug Metabolism in Canada: The Current Landscape - A Summary of This Indispensable Special Issue. Pharmaceutics.
Cannabinoid Receptor signaling
Cannabinoid ligands biased CB1-depending signal transduction. Image source: Laprairie et al. (2014) J Biol Chem (Fig 13, bottom).

Cannabinoid Research Initiative of Saskatchewan
In search of scientific evidence about the application of cannabinoids and Cannabis to humans and animals for health and disease.

Dr. Robert Laprairie
Assistant professor of Pharmacy and the new Saskatchewan-GlaxoSmithKline Research Chair in Drug Discovery and Development. His research focuses on the endocannabinoid system. He is a member of the Cannabinoid Research Initiative of Saskatchewan. He was also a winner of the 2017 CBC Saskatchewan Future 40 in the Science and Technology category. Additionally, he serves as the secondary supervisor for the U of S AAPS Chapter.

Research Spotlight
Established Research Group at University of Saskatchewan Leading Interdisciplinary Cannabis Research in Canada
By Stephanie Vuong and Robert Laprairie

With the legalization of recreational Cannabis set for October 17th, researchers will soon have greater access to Cannabis for research opportunities than previously possible. The increase in Cannabis accessibility raises concerns, such as potential risks to individuals still undergoing cognitive development, drug-drug interactions with alcohol or medications, chronic Cannabis use, increase of Cannabis use in pregnant women, etc. The legalization of recreational Cannabis may enable research for into chronic/long-term use. Currently, the limited number of pre-clinical and clinical studies being conducted are mainly focusing on (1) short-term use, (2) plant-based cannabinoids, and (3) disease states that may be treated by targeting the body’s endogenous cannabinoid system.

A cannabinoid is any molecule that is structurally or functionally related to Δ⁹-tetrahydrocannabinol, the intoxicating constituent of Cannabis.¹ The most commonly known cannabinoids originate from the Cannabis sativa plant. Over 120 plant cannabinoids have been identified to date, with THC and cannabidiol (CBD) being the two most extensively studied cannabinoids.¹ Studies report that cannabinoids may have the potential to treat many health conditions, including cancer, chronic pain, diabetes, Parkinson’s Disease, multiple sclerosis, anxiety, depression, and epilepsy.² However, these medicinal Cannabis therapeutic applications are considered to be largely based on anecdotal evidence, with limited scientific evidence. It is important to conduct more extensive research to fill the knowledge gaps associated with Cannabis and its potential medicinal utility.

The Cannabinoid Research Initiative of Saskatchewan (CRIS) consists of 20 faculty members from different disciplines, including the College of Pharmacy and Nutrition, College of Medicine, College of Agriculture and Bioresources, Western College of Veterinary Medicine, Johnson Shoyama Graduate School of Public Policy; and the Universities of Regina, Calgary, and Loma Linda. The goal of CRIS is to obtain scientific evidence about the application of cannabinoids and Cannabis to humans and animals for health and disease. CRIS is a well-rounded research group, covering aspects of Cannabis plant production, medical research, and policy. Three studies of note are: (1) the Cannabidiol in Children with Refractory Epileptic Encephalopathy (CARE-E) study, (2) age dependent oral pharmacokinetic study, and (3) basic research involving the endocannabinoid system.

The CARE-E study is investigating the safety and tolerability of using a 1:20 THC:CBD Cannabis oil extract for children dealing with refractory epileptic encephalopathy, a type of epilepsy that may lead to cognitive, behavioural and neurological impairments. These types of epilepsies are difficult to control with conventional forms of treatments, such as antiepileptic drugs and ketogenic diets. The University of Saskatchewan, the primary base for CARE-E, is currently in collaboration with Universities of British Columbia, Alberta, Manitoba, and Montréal to conduct a dose escalation study in pediatric patients with treatment-resistant epilepsy. If it can be established that the children respond well to the Cannabis oil with no-to-minimal risks, this will lead to a larger clinical trial for safety and tolerability.
In conjunction to the CARE-E study, CRIS is conducting a single oral dose study to understand the age-dependent oral pharmacokinetics of CBD and THC. Currently, there is a lack of knowledge of appropriate dosing for children dealing with refractory epileptic encephalopathy. Children go through rapid physiological changes throughout childhood, resulting in variability of pharmacokinetic parameters. Additionally, Cannabis dosing can be challenging due to the long half-lives associated with cannabinoids. This study is necessary in order to determine the appropriate dosing regimen of Cannabis oil for children. The single oral dose pharmacokinetic study is expected to begin at the start of 2019, recruiting children in 3 different age groups – infant (2-3 years old), early child (3-6 years old), and child (6-10 years old).

The endocannabinoid system plays an important role in regulating physiological processes such as locomotor activity, appetite, pain, and emotions. The endocannabinoid system consists of endocannabinoids, their receptors, anabolic and catabolic enzymes. The two best-characterized endocannabinoids are anandamide (AEA) and 2-arachidinoylglycerol (2-AG). These endocannabinoids are synthesized on demand in response to increasing intracellular calcium levels in the postsynaptic neuron. The two cannabinoid receptors - cannabinoid type 1 (CB1) and type 2 (CB2) - are mainly located on central and peripheral neurons and immune cells, respectively. These G protein-coupled receptors are primarily associated with Gi/o proteins, inhibit adenylyl cyclase, and inhibit neurotransmission and inflammatory pathways. CRIS researchers are currently studying the receptor binding sites and expression of CB1 and CB2 to better understand how plant-derived and newly synthesized cannabinoids effect these receptors and how the endocannabinoid system might be targeted for the treatment of paediatric epilepsies and Alzheimer's disease.

The CRIS group has recently been busy bringing awareness to the interdisciplinary Cannabis research happening at the UofS. Drs. Jane Alcorn, Robert Laprairie, Darrell Mousseau, and Richard Huntsman attended the Canadian College of Neuropsychopharmacology 41st Annual Meeting in Vancouver from June 27th-30th. The CRIS group successfully hosted their 1st Saskatchewan Cannabis Research Symposium on August 16-17th at the UofS. One hundred fifty researchers and knowledge users attended the two-day symposium to discuss the future of medical and recreational use of Cannabis. The symposium included many panel sessions focusing on patient experience, health policy, pharmacy practice, clinical perspectives, and research perspectives.

For more information on CRIS, please visit https://research-groups.usask.ca/cris/.

Recent Publications from CRIS:


Press Releases:


References:

Faculty Spotlight Interview

Jane Alcorn

Bio:
Dr. Alcorn is a member of the U of S Drug Discovery and Development Research Group. She joined the College of Pharmacy and Nutrition in 2001. Her teaching responsibilities include Basic and Clinical Pharmacokinetics and Xenobiotic Metabolism, in both the undergraduate and graduate programs, and she has expertise in the areas of pharmacy, pharmaceutical science, biotechnology, pharmacology, physiology, and toxicology. Additionally, she provides pharmacokinetic expertise in many collaborative and translational research projects within the province as well as expert review for the US National Toxicology Program and Environmental Protection Agency. She is also involved or has been involved with the American Nutrition Society, American Association of Pharmaceutical Scientists, International Society for the Study of Xenobiotics, Society of Toxicology of Canada, Association of Faculties of Pharmacy of Canada, Membership in the CIHR Consortium on Drug and Environmental Safety, University Veterinarian, U of S Research Ethics (Acting Director), Animal Research Ethics Board of the University of Saskatchewan (Chair), Pharmalytics Ltd. (Consultant), AdeTherapeutics (Research Director), U of S Toxicology Research Group and Western College of Veterinary Medicine (Associate Member), and Cannabinoid Research Initiative of Saskatchewan (Primary Contact and Team Leader). Her research has been funded by many funding agencies such as Children’s Hospital Foundation of Saskatchewan, Saskatchewan Health Research Foundation, Mitacs Accelerate, U of S College of Pharmacy and Nutrition and Natural Sciences and Engineering Research Council, to name a few.

Education:
- Ph.D. (Pharmaceutical Sciences), University of Kentucky, Lexington, KY, USA (2002)
- MSc. (Vet. Physiological Sciences), University of Saskatchewan, Saskatoon, Canada (1997)
- DVM. Western College of Veterinary Medicine, Saskatoon, SK (1994)
- BSc. (Biology), University of Saskatchewan, Saskatoon, Canada (1989)

Research:
Dr. Alcorn’s research interests encompass two principal areas. 1) Involvement in investigations into the determinants of neonatal exposure risk when breastfeeding mothers require medications. Her laboratory focuses on the developmental maturation of drug elimination mechanisms and the elaboration of predictive models of drug elimination for a priori assessments of drug elimination capacity in the neonate. Research in the laboratory has moved towards investigations into drug-nutrient transporter interactions in the nursing mother-neonate dyad and the consequent outcomes of such interactions on breast milk nutrient composition and biochemical/physiological development of the nursing neonate. 2) Involvement in investigations into the health benefits of flaxseed lignans and their underlying mechanism(s) of action. Specifically, this laboratory evaluates lignan pharmacokinetics and conducts investigations into the pharmacological mechanisms through which lignans affect cholesterol and glucose homeostasis. Dr. Alcorn’s research utilizes a variety of pharmaceutical analysis, molecular biology and biochemical methods as well as cell culture systems and animal models in attempts to generate new understandings in these areas of investigation. During the recent years she has also become interested in medical Cannabis related research, where she is part of several projects including clinical trials.

Selected Publications:
- Mukker, J.K., Singh, R.S.P., Muir, A.D., Kro, E.S., Alcorn, J. Comparative...
pharmacokinetics of purified flaxseed and associated mammalian lignans in male Wistar rats (2015) British Journal of Nutrition

How did your earlier career choice lead you to where you are now? “My early career choice was a toss-up between Veterinary Medicine and Teaching (Education). I chose Vet Med but conducted a summer student project that led to my decision to pursue research. I have utilized my Vet Med training and PhD training in my employment as a Professor and both were very necessary to allow me the opportunity to pursue unique career paths. For example, I was seconded into the University Veterinarian position for 5 years while functioning as a professor. The breadth and depth of the education I received in Vet Med and graduate work that followed that degree created opportunities for me unavailable to many. In particular, it has allowed me to collaborate extensively with faculty from many colleges and to have research at the basic and human/veterinary clinical level”.

What is the best career advice you have ever received? “Don’t worry about getting it exactly ‘right’, get it written. Effective and efficient written communication skills (and oral skills) are important in many careers”.

What type of impact do the supervisor/ principal investigator have on the success of the trainee? “A positive relationship is very important (although students can be successful with negative relationships). Even with positive relationships the impact of the supervisor is only partial. Good supervisors provide guidance on all the skills and competencies of a graduate program. However, the principal determinant of a trainee’s success is his- or herself”.

What can graduate students do now to prepare themselves for a successful career? “Identify weaknesses and areas of need of development and work towards improvement of these areas every single day. Identify areas of strength and capitalize on these. Learn to be part of and meaningfully contribute to a larger community (lab environment, graduate program, university, other). Embrace mentorship of others and a team player mentality”.

Jane Alcorn, Ph.D., D.V.M.
Capable, competent and efficient scholar and a long time faculty member of the College, with an extensive research background and a wealth of senior level University leadership experience.

Highlights: Current Board Member of CSPS and Saskatchewan Health Research Foundation (SHRF). Professor, and Associate Dean (Research and Graduate Affairs) - College of Pharmacy and Nutrition. Active volunteer - University and Community. Maintain extensive collaborations and granting success, and have published over 60 peer-reviewed articles and many conference abstracts. Collaborate with Saskatoon Public School Division to create an Indigenous scholars program, which seeks to smoothly transition First Nations and Metis high school students into post-secondary sciences. Supervised 2 postdoctoral fellows, >25 graduate students (MSc and PhD), >15 undergraduate summer research trainees, and ~2 dozen high school students. Centennial Alumni of Influence Award - College of Pharmacy and Nutrition (2014). Distinguished Researcher Award (2007) and Distinguished Graduate Supervisor Award (2016) - University of Saskatchewan.

Inspirational Corner

Tribute to a Legend!

“The delicate balance of mentoring someone is not creating them in your own image, but giving them the opportunity to create themselves.”

Steven Spielberg

The U of S CSPS-YSN representatives pay tribute to Dr. Kishor Wasan, Professor and Dean of the College of Pharmacy and Nutrition (2014 - 2019). He has been an outstanding mentor, scientist, teacher, friend and a great advocate for the College and the University of Saskatchewan. The initiative of the U of S AAPS Chapter started with Dr. Wasan, who served as the chapter advisor for over 3 years.

“In order to be a mentor, and an effective one, one must care. You must care. You don’t have to know how many square miles are in Idaho, you don’t need to know what is the chemical makeup of chemistry, or of blood or water. Know what you know and care about the person, care about what you know and care about the person you’re sharing with.”

Maya Angelou

As he moves on to the next phase of his career as Incoming Dean of Leslie Dan Faculty of Pharmacy, University of Toronto, the College of Pharmacy and Nutrition, the AAPS Chapter and everyone else that has been inspired, motivated, encouraged and blessed will surely miss him. Therefore, we would like to reflect on all the words of wisdom shared by Dr. Wasan on various topics such as academics, research, ethics, leadership, networking, and career and professional development.

“If I have seen further it is by standing on the shoulders of giants.”

Isaac Newton

The quotes from Steven Spielberg, Maya Angelou and Isaac Newton perfectly sums up the support received, and how we feel about his passion, dedication, generosity, work-ethic and positive attitude as we move on into the future and into the world as young scientists and leaders.
We want to say thank you for inspiring us in so many ways and best wishes for your future endeavors!

Kishor Wasan, B.Sc. (Pharm), Ph.D., FAAPS, FCSPS, FCAHS.

Bio-Current and Previous Position(s):
- Professor and Incoming Dean, Leslie Dan Faculty of Pharmacy, University of Toronto; July 1st 2019
- Professor and Dean, College of Pharmacy and Nutrition, University of Saskatchewan; August 2014-June 30th 2019
- Adjunct Professor and Distinguished University Scholar, UBC Pharmaceutical Sciences; August 2014-July 31st 2018
- Associate Dean of Research and Graduate Affairs, Faculty of Pharmaceutical Sciences, UBC; Sept. 2011-August 2014
- Professor (Tenured) and Division Chair (2001-2010), Division of Pharmacistics and Biopharmaceutics, Faculty of Pharmaceutical Sciences, University of British Columbia; July 1st 2005 to July 2014.
- Co-Director, Nanomedicine and Drug Delivery Graduate Stream, January 2011-July 2014;
- Director and Co-Founder of the NGDI-UBC June 2009-June 2014
- CIHR University-Industry Research Chair, December 1st 2003 to November 30th 2008; Renewed April 1st 2009-March 31st 2014 (CIHR/ICo Therapeutics Research Chair in Drug Delivery for Neglected Global Diseases).
- Affiliated Investigator, Vancouver Coastal Health Research Institute, September 6th 2005 to Present.
- Affiliated Faculty, Centre for Higher Order Structure Elucidation (C-HORSE; www.chem.ubc.ca/chorse/faculty.html) at UBC, 2006 to Present
- Member, Interdisciplinary Oncology Program, UBC, 2006 to Present
- Mentor, CIHR Health Research Training Program in Transplantation, UBC, 2009 to Present
- Distinguished University Scholar; University of British Columbia, April 1st 2004 to Present
- Chair, Division of Pharmaceutics and Biopharmaceutics, Faculty of Pharmaceutical Sciences, University of British Columbia; January 1st 2001 to December 31st 2009.
- Associate Professor (Tenured), Division of Pharmaceutics and Biopharmaceutics, Faculty of Pharmaceutical Sciences, University of British Columbia; July 1st 2000 to June 30th 2005.
- Natl. Director, Summer Student Research Program for Canadian Pharmacy Students; January 1st 2001 to June 2010.
- Assistant Professor, Division of Pharmaceutics and Biopharmaceutics, Faculty of Pharmaceutical Sciences, University of British Columbia; February 1st 1995 to June 30th 2000.
- Director of Summer Student Research Programs, Faculty of Pharmaceutical Sciences, University of British Columbia; July 1st 1997 to October 31st 2001.

Other Past and Present Position(s), Appointment(s) and Volunteering: (Selected)
- September 2016-2019, Elected Secretary of the Canadian Academy of Health Sciences Board.
- August 2018-July 2020; Elected President Elect AFPC (2018-19); Incoming President July 1st 2019
- Founding Member, Canadian Society of Pharmaceutical Sciences (CSPS); 1996-
- Member, American Association of Pharmaceutical Scientists; 1988-
- Member, American Pharmaceutical Association; 1991-
- Member, American Association of Colleges of Pharmacy; 1992-
- Member, American Association for Cancer Research; 1996-
- Member, AAPS Focused Meeting on Pharmaceutics Programming Committee; 2000
- Treasurer, Canadian Society of Pharmaceutical Sciences; 2000-2002
- Chair, AAPS Lipid-Based Drug Delivery Systems Focus Group; Nov 2003-Nov 2006
- External Reviewer, University of Manitoba Faculty of Pharmacy Graduate Program; March 2004
- Faculty Advisor, UBC Student Chapter of AAPS; May 2006 to Present
- Steering Committee Member, AAPS Lipid-Based Drug Delivery Systems Focus Group-09 2009 to 04 2011. Steering Committee Member, AAPS Focus Group on Global Health-November 2009 to Present
- Chair-Elect, AAPS Pharmaceuticals in Global Health Focus Group-March 2010 to Present
- Founding Member, Canadian Initiative for Global Health lead by Dr. Alan Bernstein, August 2011-
- Member, Prix Galien Selection Committee, November 2015-Present
- Chair, AFPC Council of Deans, July 1st 2015-June 30th 2017
- Member, AFPC Board of Directors, July 1st 2015-Present
- Member, Board of the Canadian Pharmaceutical Sciences Foundation, July 1st 2016-Present

Education, Training and Experience:
- Post-Doctoral Fellowship, Department of Cell Biology, Research Institute, Cleveland Clinic Foundation (Supervisor; Richard E. Morton Ph.D.); January 1994 to December 1994.
- Post-Doctoral Fellowship, Department of Thoracic, Head & Neck Medical Oncology, M.D. Anderson Cancer (Supervisor; Roman Perez-Soler M.D.); October 1993 to December 1994. (Cross-appointment)
- Doctor of Philosophy, University of Texas Health Science Center at Houston, Graduate School of Biomedical Sciences, Department of Clinical Investigations, M.D. Anderson Cancer Center and Department of Pharmacology, University of Texas Medical School at Houston; (Specialization; Pharmaceuticals (Pharmacokinetics) & Cellular and Molecular Pharmacology; Advisor; Gabriel Lopez-Beresteen M.D.) December 1993.
- Granted Master of Science Equivalency in Pharmaceutics, University of Texas Health Science Center at Houston, Graduate School of Biomedical Sciences (Advisor; Gabriel Lopez-Beresteen M.D.) July 1992.
- Pre-Doctoral Fellow, Clinical Immunology and Biological Therapy, Department of Clinical Investigations, Division of Medicine, The University of Texas M.D. Anderson Cancer Center, Houston, TX. April 1989 to October 1993.
- Hospital Residency, Oncology, Presbyterian Hospital of Dallas, The University of Texas; January 1986-August 1986.
- Registered Pharmacist (RPh); passed NAPLEX August 1986 (License No. 29383)
- Bachelor of Science in Pharmacy, The University of Texas at Austin; December 1985.

Awards: (Selected)
- Canadian Society of Pharmaceutical Sciences Fellow Award. 2013
- Canadian Society of Pharmaceutical Sciences Leadership Award. 2011
- Elected Fellow of the Canadian Academy of Health Sciences. 2010
- CIHR ICo Therapeutics Research Chair in Drug Delivery for Neglected Global Diseases 2009-2014
- Association of Faculties of Pharmacy of Canada-Pfizer Research Career Award. 2008
- American Association of Pharmaceutical Scientist Outstanding Lipid-Based Drug Delivery Award. 2007
- Honorary Diploma from the Academie des Alpilles of France. 2006
- Gatofosse Canada/Canadian Society of Pharmaceutical Sciences Research Award. 2005
- Named 1 of 25 Up-and-Coming Innovators in BC by BC Business Magazine. 2004
Contact
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The University of Alberta