AFPC New Investigator Research Award: Shyh-Dar Li

Dr. Shyh-Dar Li received his B.Sc. in Pharmacy from National Taiwan University in 1998, and Ph.D. in Pharmaceutical Sciences from The University of North Carolina at Chapel Hill in 2008. He finished his postdoctoral training at Moores Cancer Center at the University of California, San Diego in 2009. He is now an assistant professor at the Leslie Dan Faculty of Pharmacy, University of Toronto, and a principal investigator at the Ontario Institute for Cancer Research. His research focuses on developing innovative drug delivery systems to enhance cancer chemotherapy. His research program has been supported by NIH and CIHR. Dr. Li has won several research awards, including 2013 AAPS New Investigator Award in Pharmaceutics and Pharmaceutical Technologies, 2013 CIHR New Investigator Award, 2013 CSPS Early Career Award, and 2012 Prostate Cancer Foundation Young Investigator Award.

Abstract

Nanoparticle-based drug delivery is an emerging technology for targeting anticancer drugs to tumors, and a number of nanoparticle-based drugs are now in clinical applications as chemotherapeutics. While these nanomedicines exhibit reduced toxicity, most candidates and products do not enhance efficacy in human patients. The failure of current nanomedicines to achieve enhanced safety *and* efficacy is largely attributed to limited tumor bioavailability, and is an issue of suboptimal drug release profile. For example, drug release from Doxil® (PEGylated liposomal doxorubicin) is slow (<1%/day), leading to reduced bioavailability in tumors; paclitaxel partitions rapidly out of Abraxane® (nanoparticle albumin bound paclitaxel) during blood circulation, and the pharmacokinetic and biodistribution profiles are not enhanced compared to the native drug. Dr. Shyh-Dar Li's research focuses on addressing the critical issue of site-specific drug release, and his team has created two nanoparticle drug delivery technologies that enhance tumor bioavailability. The first technology is a polysaccharide drug conjugate that targets docetaxel to tumor stroma and exhibits sustained release within the tumor microenvironment. The second technology is a thermosensitive liposome that is triggered to burst-release the drug cargo in seconds within a locally heated tumor (39-43°C). Both technologies have shown enhanced efficacy and reduced toxicity in multiple animal models compared to standard chemotherapy.

AFPC Graduate Student Research Award: Wael Alata

Wael Alata received his bachelor of science in pharmacy from Damascus University, Syria in 2006. He moved to Paris, France in 2007 to be trained in the laboratory of pharmacology of the hospital Pitié Salpêtrière. In 2010 he graduated with a MSc. in pharmacology, pharmacokinetic and phramacogenetic at the faculty of pharmacy of the University Paris11. He then moved to Canada to pursue PhD studies under the supervision of Dr Frederic Calon in the faculty of pharmacy of Laval University. He expects to graduate early in 2015. He is three time recipient of awards for poster presentation, and has already four publications in peer-reviewed journals.

The research of Wael Alata under the supervision of Dr. Frederic Calon focuses on the role of the blood-brain barrier (BBB) in neurodegenerative diseases and on potential strategies to ameliorate the passage of therapeutic molecules across the BBB. One of such strategies involved the use of a monoclonal antibody targeting the transferrin receptor. In his research, he routinely performs the *in situ* brain perfusion technique, which is one of the best methods to quantify the brain uptake of a drug through the BBB, and used in less than dozen of laboratories worldwide.

Abstract

Monoclonal antibodies (mAbs) targeting blood−brain barrier (BBB) transporters are being developed for brain drug targeting. However, brain uptake quantification remains a challenge, particularly for large compounds, and often requires the use of radioactivity. In this work, we adapted an *in situ* brain perfusion technique for a fluorescent mAb raised against the mouse transferrin receptor (TfR) (clone Ri7). We first confirmed *in vitro* that the internalization of fluorolabeled Ri7 mAbs is saturable and dependent on the TfR in N2A and bEnd5 cells. We next showed that the brain uptake coefficient (Clup) of 100 μg (~ 220 nM) of Ri7 mAbs fluorolabeled with Alexa Fluor 750 (AF750) was 0.27 ± 0.05 μL g^{-1} s^{-1} after subtraction of values obtained with a control IgG. A linear relationship was observed between the distribution volume VD (μL g^{-1}) and the perfusion time (s) over 30−120 s (r2 = 0.997), confirming the metabolic stability of the AF750-Ri7 mAbs during perfusion. Co-perfusion of increasing quantities of unlabeled Ri7 decreased the AF750-Ri7 Clup down to control IgG levels over 500 nM, consistent with a saturable mechanism. Fluorescence microscopy analysis showed a vascular distribution of perfused AF750-Ri7 in the brain and colocalization with a marker of basal lamina. To our knowledge, this is the first reported use of the *in situ* brain perfusion technique combined with quantification of compounds labeled with near-infrared fluorophores. Furthermore, this study confirms the accumulation of the antitransferrin receptor Ri7 mAb in the brain of mice through a saturable uptake mechanism.

Canadian Foundation for Pharmacy Graduate Student Award for Pharmacy Practice Research: Mina Tadrous

Mina Tadrous is currently completing a PhD in Pharmaceutical Science working in the field Pharmacoepidemiology in the Leslie Dan Faculty of Pharmacy at the University of Toronto under the supervision of Dr. Suzanne Cadarette. Mina previously completed a MSc in Health Outcomes and Policy Research at the University of Tennessee, and a Doctor of Pharmacy at Albany College of Pharmacy. He also completed a pharmacy residency in Drug Information and health Outcomes at the University of Tennessee and St. Jude Children's Research Hospital.

Mina's research interests include post-market surveillance of medications and vaccines, pharmacoepidemiology, pharmacovigilance, and the application of epidemiology to studying medication safety and effectiveness.

Abstract

INTRODUCTION: Bisphosphonates are first-line treatment for osteoporosis. Gastrointestinal (GI) adverse events (AE) are the primary reason for non-adherence. Little is known about the comparative GI safety of bisphosphonates.
PURPOSE: Leverage published clinical trial data to examine the comparative GI safety of bisphosphonates.
METHODS: We completed a systematic review of all English-language clinical trials that assessed bisphosphonate safety and/or efficacy in primary osteoporosis through to 2012. Randomized, blinded, and controlled studies were eligible. The primary outcome was any GI-related AE. Subanalyses were completed for upper GI symptoms, serious GI, nausea, esophageal-related events, and discontinuation due to AE. A Bayesian-based network meta-analysis was completed to allow for indirect comparisons. Results were reported as the probability that a specific drug had the highest number of events.
RESULTS: We identified 50 studies: 32 alendronate, 12 risedronate, 5 etidronate, and 7 zoledronic acid. Zoledronic acid had the highest probability of having the highest number of any GI AE (91%) and nausea (70%). Etidronate (70%) and zoledronic acid (28%) had the highest probability of having the greatest attrition due to AE. Etidronate had the highest probability (56%) of having the greatest number of upper GI symptoms among oral bisphosphonates.
CONCLUSION: Zoledronic acid had the highest probability of causing the greatest number of GI AE, possibly related to nausea. These results question the assumption that annual zoledronic acid will translate into better adherence. Little difference was found between alendronate and risedronate for serious AE. More research into real-world implications of the comparative safety of bisphosphonates is needed.

Pfizer Research Career Award: Anna Taddio

Dr. Anna Taddio is Professor at the Leslie Dan Faculty of Pharmacy, University of Toronto, Senior Associate Scientist at The Hospital for Sick Children, and Assistant Scientific Staff at Mount Sinai Hospital. Dr. Taddio completed a Baccalaureate degree in pharmacy in 1989, a Residency in hospital pharmacy in 1990, and a Doctor of Philosophy degree in clinical pharmacology in 1997. Her program of research examines: (1) the short-term and long-term effects of pain in children; (2) the effectiveness and safety of pain management interventions; and (3) evidence based practice and implementation research.

Dr. Taddio has authored over 150 scientific papers and book chapters, and is the recipient of numerous awards recognizing her scholarly achievements, including: (1) New Investigator Award by the Canadian Institutes of Health Research (2003); (2) Piafsky Young Investigator Award by the Canadian Society for Clinical Pharmacology (2006); (3) Young Investigator Award by the International Association for the Study of Pain Special Interest Group on Pain in Childhood (2006); and (4) Media & Policy Fellowship Award by the Mayday Fund (2008).

Research Interests

Since 2008, Dr. Taddio has been leading a national inter-disciplinary team, Help ELiminate Pain in KIDS (HELPinKIDS), investigating and promoting evidence-based pain management during childhood vaccination. Led by Taddio, HELPinKIDs made significant progress in mobilizing knowledge into practice in the management of pain during childhood vaccination. Their wide-reaching and comprehensive knowledge translation (KT) strategy has created a network of invested stakeholders, increased awareness of the need to provide pain relief, provided evidence-based knowledge synthesis and practice tools, informed immunization policy and education, and demonstrated impact on health service delivery. Dr. Taddio has received the following awards for her work related to HELPinKIDS: (1) Publication of the Year by the Canadian Society for Pharmacology and Therapeutics for the HELPinKIDS clinical practice guideline about childhood vaccination pain management (2010); (2) Noni MacDonald Award by the Canadian Paediatric Society for significant contribution to paediatrics (2012); (3) Best Pain Awareness Award by the Canadian Pain Society and Canadian Pain Coalition for the HELPinKIDS educational video and website (2012); and (4) Jeffrey Lawson Award by the American Pain Society for outstanding advocacy in pediatric pain (2014).

Janssen Innovation in Education Award: Chantal Pharand, Françoise Crevier, Nancy Sheehan



Chantal Pharand is Professor and Vice-Dean, Undergraduate Studies at the Faculty of Pharmacy of the Université de Montréal. For the past 11 years, she has been actively involved in pharmacy program development, actively participating in the development and chairing the implementation of the Entry-Level PharmD Program; she is now chairing the development of the Non-Traditional PharmD Program. In addition to her academic activities, she practices as a Pharmacotherapeutic Specialist at the Hôpital du Sacré-Coeur de Montréal where she has practiced in inpatient and outpatient cardiology for the past 20 years, in the Coronary Care Unit for 10 years and now as co-director of the Risk Reduction Clinic. Finally, she has actively conducted research in the area of coronary artery disease and antiplatelets.

Françoise Crevier is a specialist in instructional design. With more than thirty years of experience in instructional design and a solid academic background, she has acquired skills to develop rich, stimulating and effective learning environments. To date, Françoise has developed more than a hundred learning environments; approximately half are distance learning and e-learning environments. She is also involved in curriculum development in competency-based contexts. For the last ten years, she has been involved in the design and development of the Pharm. D. Program for the Faculty of Pharmacy of the Université de Montréal.

Nancy Sheehan is a Pharmacotherapeutic Specialist in HIV and antiretroviral therapeutic drug monitoring (TDM). She began teaching at the Faculty of Pharmacy of the Université de Montréal in 2004, mainly on viral, parasitic and fungal infectious diseases as well as on tropical and travel medicine and rapidly became involved in the development and implementation of the Entry-Level PharmD Program. She now sits on the steering committee for the development of the Non-Traditional PharmD Program. She continues to practice at the Chronic Viral Illness Service of the McGill University Health Centre (a specialized clinic for the treatment of HIV and hepatitis C) and coordinates the Québec antiretroviral TDM program. She is a primary investigator on multiple pharmacokinetic studies on the pharmacokinetic / pharmacodynamic determinants of virologic response and on drug-drug interactions related to HIV and hepatitis C therapy.

Janssen Innovation in Education Award: Chantal Pharand, Françoise Crevier, Nancy Sheehan

Abstract

In 2007, we deployed a competency-based First Professional Degree Doctor of Pharmacy program (Pharm. D.), targeting 6 generic and 3 vocational competencies. One of the latter was Service Learning. However, this first version of the program did not put enough emphasis on the development of this competency. Methods: In order to allow students to build this competency, we redesigned 6 courses, for a total of 8 credits. This led to the development of a learning environment that allowed all 600 1st- to 3rd-year pharmacy students to work together in teams of 10-12 towards a common project. In addition to developing the Service Learning competency, the objectives of these new courses were to: a) cause an important social implication by the student; b) promote the role of pharmacist as change agent with regards to public health; c) reinforce transverse competencies including teamwork, communication and leadership. Each team included students from all 3 cohorts. Each team's goal was to create, develop and implement a project that had to: a) generate a social or community impact, b) be deployed in the community; c) respect 1 of 2 imposed health topics (e.g. obesity or stress). Three mentors and 2 faculties guided the students in their projects. Results: On the first year this innovation was implemented, 50 projects were developed, 18 on obesity and 32 about stress. The projects ranged from development of websites, videos or tools for pharmacists, direct interventions with the targeted audience, organization of awareness campaigns, government representations, etc. All teams identified and collaborated with external resources needed to complete their projects. Even though students are concerned at the beginning of their project, they gain confidence and are able to go through the process, achieve their goal and deliver very high-quality productions. Conclusion: Three years after implementing this innovation, we can confirm that this project has a considerable impact on the development of the Service learning competency in our students and will remain part of the curriculum.

PEBC Award for Excellence in Research or Innovation in Assessment of Competence: David Fielding

David Fielding is a Professor in the Faculty of Pharmaceutical Sciences at the University of British Columbia. He obtained his B.Sc. (Pharm.) and M. Sc. (Biopharmaceutics) degrees from the College of Pharmacy, Dalhousie University and a Doctorate of Education (Adult Education) degree from UBC. He has been a member of the pharmacy faculty at UBC since 1977. He received the 1989 Squibb Award for Excellence in Pharmaceutical Teaching from the UBC Faculty of Pharmaceutical Sciences; a UBC Killam Teaching Prize in 1992; and, the Bristol-Meyers Squibb National Award for Excellence in Education from the Association of Faculties of Pharmacy of Canada in 1996. He has held the David H. MacDonald Professorship in Pharmacy Practice and the Dr. Tong Louie Chair in Pharmacy Administration. He has served terms as President of The Canadian Conference on Continuing Education in Pharmacy; The Canadian Council for the Accreditation of Pharmacy Programs; and, the Association of Faculties of Pharmacy of Canada. From 2002 until 2012 he served as UBC's Associate Dean, Academic and the inaugural Chair of the Faculty's Office of Educational Support and Development. Dr. Fielding is currently completing an administrative leave where he has been investigating best practices and principles for learning assessment, with a particular emphasis on how to harness the power of assessment for the promotion of learning.

Abstract

The principal focus of Dr. Fielding's 40-year research career has been 'evaluation' – evaluation of the outcomes of educational programmes, educational innovations and initiatives, pharmacy services and pharmaceuticals. Initially, his research evaluated the design and implementation of continuing professional education programs and their impact on practice behaviours. Additional work at this time focused on the development and evaluation of strategies to assess and assure practice competence. Later, he was a founding member of the Collaboration for Outcomes Research and Evaluation (CORE), a multi-discipline group that concentrated on investigating the safety and effectiveness of specific pharmaceuticals and the outcomes of selected pharmacy services. Most recently, he has worked with other members of the UBC pharmacy faculty to evaluate the impact of curriculum and assessment changes and innovations. Government granting agencies, foundations, pharmaceutical companies and the university have supported his research. He has authored or co-authored more than 100 articles, chapters, abstracts and reports. He has been an invited speaker/participant on over 60 occasions at professional and scientific meetings in Canada, the United States, England, Sweden, South Africa, New Zealand, Australia and Hong Kong. He has received two international awards to recognize his achievements in research.

Award Winners

Merck Postgraduate Pharmacy Fellowship Award: Tullio Esposito

Tullio Esposito completed his Bachelor of Science in Pharmacy in the Faculty of Pharmaceutical Sciences at the University of British Columbia in 2013. He is currently completing his M.Sc studies in the same faculty under the guidance of Dr. Urs O. Häfeli within the nanomedicines and drug delivery stream. His research interests are centered around using nanomaterials to modulate the immune system. His current research focus involves developing a novel therapeutic vaccine against pancreatic ductal adenocarcinoma, one of the most deadly cancers in Canada. Part of the aggressive nature of this disease stems from its ability to recruit a large numbers of suppressive immune cells; these cells not only help the tumor grow but also dampen beneficial immune responses that oppose the tumor. Tullio's project involves designing a nano-scale platform to target ablative radiation and a specialized adjuvant directly into the tumor following systemic administration. This construct is designed to help reverse the immunosuppressive nature of pancreatic ductal adenocarcinoma while augmenting effector immune responses against the tumor. Such a novel strategy is drastically needed seeing how the 5-year relative survival rate for this form of cancer has barely changed in the last 30 years.

Rx&D Student Research Poster Award Winners

Congratulations to our 10 winners!

Adil Rasheed	University of Toronto
Sara Abdi	Memorial University of Newfoundland
Zaid Alma'ayah	University of Alberta
Leonard Angka	University of Waterloo
Sidi Yang	University of Manitoba
Jay Toulany	Dalhousie University
In Whang	University of British Columbia
Merlin Thangaraj	University of Saskatchewan
Stephanie Bourque	University of Montreal
Cyril Bigo	Laval University