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Congress opening and keynote presentation 1: APFP keynote
Modern Pharmacological research of traditional medicine based on treatment of diseases

Prof Guanhua Du

APFP Keynote: Goldfields Theatre, December 1, 2024, 5:30 PM - 6:30 PM

Biography:

Guanhua Du is a tenured professor of Pharmacology in Peking Union Medical College; Academician of the International Eurasian Academy of Sciences; Former-President of the Chinese Pharmacological Society; Councilor of the Executive Committee of the International Union of Basic and Clinical Pharmacology (IUPHAR), Councilor of the Executive Committee of the Asia Pacific Federation of Pharmacologists (APFP); and Director of National Centre for Pharmaceutical Screening. Dr. Du got his Ph.D. degree from Peking Union Medical College in 1995, and conducted his postdoctoral research in University of Liege, Belgium from 1995 to 1998. Dr. Du is mainly engaged in drug discovery and development, screening methods and strategy, and drug effect and mechanism research in cerebrovascular and neurodegenerative disease. He originated the national high-throughput drug screening system in China, and provided drug screening services for over 300 million samples for domestic pharmaceutical institutions or enterprises. In recent 10 years, Dr. Du has published more than 500 papers and more than 30 monographs, and applied for more than 90 patents. He has completed preclinical research of 9 new drugs, among which 3 have been in market, and 6 entered clinical trials. He is the Editor-in-Chief of Pharmacology Research: Modern Chinese Medicine, Associate Editor of Pharmacology & Therapeutics and more than ten other scientific journals.

Traditional medicines are the accumulation of clinical experiences in the long history. Among these traditional medicines, the traditional Chinese medicine (TCM) is important and special with the systemic theory and complete system therapeutic drugs. In the TCM, the drugs used for treatment diseases based on the traditional pharmacology of TCM. Since the 19th century, the TCM has been researched by the methods of modern pharmacology and obtained rich results and important progress in the following aspects.

1. The research of the TCM prescriptions. In TCM, the typical prescriptions include the doctors made for patient clinically, named as Fang(方， prescription) and also called as tang(汤, tang, decoction)， based on the application form. The modern research on the fang of TCM include many roaches with different methods.

(1) Understanding and verification of formula theory.
(2) Research on material basis of drug action.
(3) Study on mechanism of drug action;
(4) Research on new indications aimed at the development of new drugs.
(5) Exploration of new theories and their relevance to traditional understanding.

2. The research of single remedy, or the medicinal materials. Based on the ancient and modern pharmaceutical monographs, there are thousands of medicinal materials has been used as drugs in TCM. The modern research of medicinal materials with the development of chemistry. Until now, almost all medicinal materials have been researched and lot of chemicals has been found. The research strategies include:

(1) Chemical composition analysis, biological activity screening and evaluation of chemical components, pharmacological action research.

(2) Fractions isolated from natural remedy and evaluated there bioactivities.
(3) Formulation granules. Formula granule is a modern application form of traditional Chinese medicine.

3. Research on compounds derived from TCM. The research of compounds derived from TCM mainly focuses on the discovery and evaluation of their activities. Although the long-term application of traditional drugs has accumulated a lot of information about biological activities or pharmacological effects, it still needs a lot of work to prove these effects with modern pharmacological methods.
(1) Discovery of active compounds. After evaluation, a number of compounds with significant activity and good pharmacological effects have been found as drugs in clinical application, such as ephedrine, artemisinin, berberine so on.
(2) Structural modification of active compounds.
(3) The application of active compounds from Chinese medicine, including the crystal form, polycrystalline form or eutectic study of substance existence.

Through these studies, the bioavailability of these compounds has been effectively improved, and the pharmacological effects have been better played. The modern pharmacological research of traditional medicine is of great value and significance for interpreting the function of traditional medicine, understanding the characteristics of clinical application, and developing new drugs and new therapeutic methods for treating diseases.

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Making and Using Medicines better using a data science approach

Prof Reecha Sofat

BPS Lecturer: Goldfields Theatre, December 2, 2024, 8:00 AM - 8:50 AM

Biography:

Professor Reecha Sofat is Breckenrdige Chair in Clinical Pharmacology and Therapeutics at the University of Liverpool and an NIHR Research Professor. She is Vice President, Clinical at the British Pharmacological Society, Associate Director at the British Heart Foundation Data Science Centre which is led by Health Data Research UK. She has also recently taken up Chair of the Board at the Professional Record Standards Body. Her activities are linked to her research, the golden thread being data sciences. Her research interests are in making and using medicines better using a data science approach. In using medicines better she leverage electronic health record data linked to health outcome data to understand how and where medicines are used, including strategies to inform medicines policy decisions, cost-effectiveness as well as methods such as causal inference to determine medicines repurposing oppurtunities. Making medicines better is about leveraging large scale biological data such as genomics and multi-omics to understand the molecular underpinnings of complex disease better so as to begin to unmet need and use these methods to better identify drug targets or therapeutic oppurtunities.

Medcines are one of the most common health care interventions. However, following introduction of medicines or therapeutics into clinical practice we are not always able to understand if they are used as intended or if they are having the intended effects. One way to be able to do this is by ensuring medicines data are linked to health outcome data so as to enable us to understand the clinical and cost-effectivenss better. Until recently, this was not possible in the UK, however we now show what can begin to be understood if this were possible. In the same way we can use large scale data to use medicines better we can use the growing fields of multi-omics (including genomics, proteomics, metabolomics) to make medicines better. By embedding research into routine clinical practice and using both clinical data linked to -omic data we can begin to understand the biological and patholphysioloy of disease better and use these measures and statistal method to discovery repurposing oppurtunities as well as discovery of drug targets.

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To improve is to change – shifts in aged care pharmacist accountability and responsibility

Dr Amanda Cross

PSA Lecturer: Goldfields Theatre, December 2, 2024, 4:15 PM - 5:15 PM

Biography:

Dr Cross is an NHMRC Emerging Leader research fellow at the Centre for Medicine Use and Safety, Monash University. She has secured over $4.8million in research funding, and published over 30 papers (including 16 has first author). She has an emerging national and international profile, focused on medication safety in older adults and knowledge translation in aged care. Her current work is evaluating new roles for health care professionals, particularly pharmacists, to act as system-level knowledge brokers to support guideline implementation in residential aged care. Dr Cross is also a practicing pharmacist, conducting home and residential medication management reviews.

The introduction of the Australian aged care onsite pharmacist model marks a new era for pharmacists in residential aged care. This innovative model integrates pharmacists into the aged care multidisciplinary team, emphasizing medication safety and promoting collaborative, resident-centred care. Enhanced involvement in resident-level services, such as medication reconciliation and review, is a logical extension of current practices. However, system-level roles may be unfamiliar to many pharmacists, representing a significant shift in accountability and responsibility. The Royal Commission into Aged Care Quality and Safety called for fundamental and systemic reform in aged care and identified medication management and safety as an essential area for improvement. To achieve these reforms, pharmacists must take on system-level roles and act as knowledge brokers. This new role will involve acting as knowledge managers, linkage agents, and capacity builders to translate evidence into practice at all levels of the organisation. By stepping into these roles, pharmacists can drive the necessary system-level changes to ensure high standards of medication safety and overall care in the aged care sector.

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From brain peptides to the brain-gut axis - unravelling the science behind obesity to improve outcomes

Margaret Morris

ASCEPT Lecturer: Goldfields Theatre, December 3, 2024, 8:00 AM - 8:50 AM

Biography:

Margaret Morris is Professor of Pharmacology at UNSW Sydney. She is known nationally and internationally in the research field of obesity, especially around the central control of appetite, the transmission of obesity across generations, and impacts of the modern diet on metabolic health and cognition. She has over 310 publications in leading obesity, neuroscience, pharmacology, endocrinology and physiology journals, reflecting the multidisciplinary nature of her research, which currently explores the mechanisms underlying obesity, and the role of the gut-microbiome-brain axis in behaviour and cognition. Her research work is extensively discussed in mainstream print, radio, television and social media, with over a million reads in The Conversation. Currently funded by NHMRC and ARC, Prof Morris has successfully supervised 35 PhD and 60 Honours students to completion. She is a strong advocate for Pharmacology, having played a key role in educating clinicians, scientists and young medical researchers in Pharmacology for more than 35 years across three Universities.

From brain peptides to the brain-gut axis - unravelling the science behind obesity to improve outcomes

Over the past 20 years growing insight into the regulation of energy balance and appetite has contributed to significant advances in the development of drug treatments for obesity, after early approaches targeting a single orexigenic peptide such as neuropeptide Y, or anorexigenic mediators like leptin failed to translate into effective therapies. Therapies targeting multiple pathways, such as the dual GIPR antagonist/GLP-1 agonist are currently under investigation. This period also heralded greater understanding of transmission of obesity across generations, including via the paternal line[1].

Our work examines the drivers of the obesity epidemic, including availability of energy dense 'discretionary' foods high in fat and sugar whose consumption is associated with metabolic dysfunction and mild cognitive impairment[2]. Increasing evidence implicates changes in the composition of the gut microbiome in these behavioural effects[3]. While the gut microbiome plays a crucial role in energy metabolism and nutrient absorption, and its composition differs between obese and lean individuals, it is unclear whether this is tractable in terms of treatment using interventions such as probiotics, prebiotics, and fecal microbiota transplants to restore a healthier gut microbiome[4].

Another environmental factor of relevance to obesity risk is stress exposure, including in early life[5]. Thus, this talk will advance the case that this pressing global health issue requires a more nuanced understanding of obesity as a complex neuroendocrine disorder, with multifaceted environmental drivers. Integrated therapeutic approaches that target these factors are likely to be most effective.

1 Ng SF et al (2010) *Nature* 467(7318), 963-966
2 Morris MJ et al (2015) *Neurosci Biobehav Rev* 58, 36-45
3 Beilharz J et al (2016) *Brain, Behav Immunity* 57, 304-13
4 Beilharz JE et al (2018) *Molec Psychiatry* 23, 351-361
5 Maniam J and Morris MJ (2012) *Neuropharmacology* 63, 97-110

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When we say Nothing about us, without us: You say?

Prof Faye McMillan

APSA Lecturer: Goldfields Theatre, December 3, 2024, 4:15 PM - 5:10 PM

Biography:

Professor Faye McMillan AM is a Wiradjuri yinaa (woman) originally from Trangie, NSW. Faye is a community pharmacist and is recognised as the first Indigenous Australian to hold a western degree in pharmacy in this country. Faye is a strong advocate for improving Indigenous health care across professions, notably being a founding member and past chair of Indigenous Allied Health Australia. Faye is currently one of two Deputy National Rural Health Commissioners and works at The University of Technology Sydney (UTS) as a Professor in Indigenous Health in the School of Public Health, as well as a board member of The Australian Pharmacy Council (APC) and is also the chair of the APC Indigenous health strategy group. Faye has received numerous accolades for her leadership and contribution to population health, education, equity, and the community. In 2021 Faye was appointed as a Member (AM) of the Order of Australia in the Queen's Birthday 2021 Honours List. Faye's appointment recognises her significant service to Indigenous mental health, and to tertiary education. In 2023 Faye was made a Fellow of the Pharmaceutical Society of Australia (PSA) and in 2022 she was named the PSA Pharmacist of the year; in 2019 she was named as the NSW Aboriginal Woman of the year; in 2022 & 2017 she was recognised in the Who's Who of Australian Women; and in 2014 included in the Australian Financial Review and 100 Women of Influence. Faye is also the 2023 Harkness Fellow for Australia, as well as being a Lifelong Fellow of the Atlantic Institute as an Atlantic Fellow for Social Equity and a Senior Fellow of the Higher Education Academy. Faye holds a Doctor of Health Science, Master of Indigenous Health, Master of Social Change Leadership, B. Pharm, Grad Cert Wiradjuri Language, Culture and Heritage, Grad Cert Indigenous Governance, Grad Cert Education, Dip Counselling, Cert IV Training and Assessment and is a Senior Fellow Higher Education Academy and Lifelong Atlantic Fellow for Social Equity.

Deputy National Rural Health Commissioner Professor Faye McMillan will explore what it is to build aspiration, education, and professional practices that honour First Nations knowledge and systems and enable First Nations people to become highly skilled health professionals with cultural expertise that benefits all in the community. Professor McMillan will explore how we can nurture, maintain and strengthen relationships to work together to achieve equity and opportunity for everybody and what is it to be an advocate and ally. Recognising that true change can only be achieved when those at the table reflect the communities they serve, Professor McMillan will pose the question who has a seat at your decision making table and importantly who does not?

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Message in a model: GPCR allostery from theory to practice

Arthur Christopoulos

ASCEPT Lecturer: Goldfields Theatre, December 4, 2024, 8:00 AM - 8:50 AM

Biography:

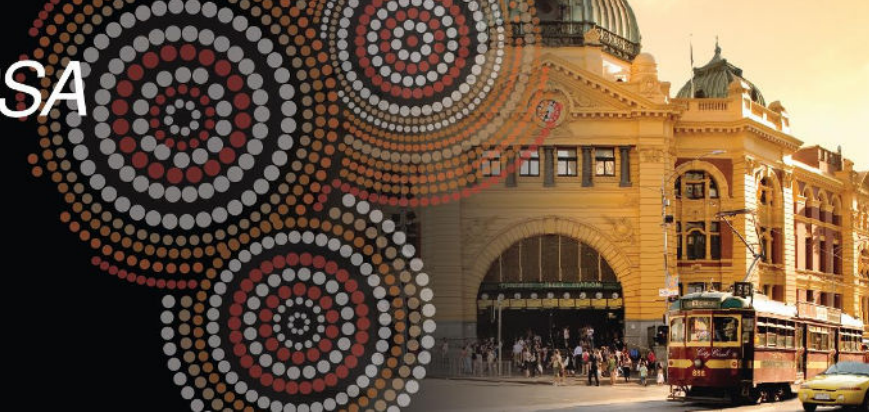
Arthur Christopoulos is the Professor of Analytical Pharmacology and Dean of the Faculty of Pharmacy & Pharmaceutical Sciences, Monash University. His research focuses on novel paradigms of drug action at G protein-coupled receptors (GPCRs) and has been applied to studies encompassing neurological and psychiatric disorders, cardiovascular disease, obesity, diabetes, chronic pain and addiction. He has received long-term support from international and national competitive, charitable and commercial sources, as well as being academic co-founder of two recent GPCR spinouts/startups. He has over 370 publications, including in leading international journals such as Nature, Science and Cell, and has been the recipient of major awards from ASCEPT, ASPET, the BPS and IUPHAR. Since 2014, Clarivate Analytics have annually named him a Highly Cited Researcher in Pharmacology & Toxicology. In 2021 he was elected a Fellow of the Australian Academy of Science for his seminal contributions to drug discovery.

Message in a model: GPCR allostery from theory to practice

Arthur Christopoulos. Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Parkville, VIC, Australia.

G protein-coupled receptors (GPCRs) represent the largest target class for medicinal agents (Santos et al., 2017). Historically, drug discovery at GPCRs was characterised by a focus on orthosteric agonists or competitive antagonists as the predominant therapeutic modality (Christopoulos, 2002). The turn of the millennium, however, ushered in two major conceptual and methodological breakthroughs that have transformed the field. The first breakthrough was the recognition that GPCRs (and indeed, all receptors), possess spatially distinct allosteric binding sites, which can yield unprecedented modes of on-target selectivity, including the potential for signal pathway-biased agonism/modulation (Changeux and Christopoulos, 2016). The second breakthrough over a similar time frame was the enormous impact that structural biology has had on understanding GPCR drug actions at the molecular level (Thal et al., 2018). The intersection of these two major advances in the field is becoming increasingly appreciated via attempts to link pharmacological hallmarks of GPCR allostery to molecular-level structural and dynamic insights. Moreover, the theoretical promise of allosteric and biased GPCR drugs as new classes of medicine is also starting to be rationally addressed in preclinical-to-clinical translational research, highlighting both opportunities and challenges that must be incorporated into contemporary drug discovery programmes in a holistic manner. These studies also highlight the ongoing and vital role of analytical pharmacology in modern GPCR drug discovery (Kenakin and Christopoulos, 2013).

Changeux JP and Christopoulos A (2016) Cell 166: 1084-1102
Christopoulos A (2002) Nature Rev. Drug Discovery 1: 198-210
Kenakin T and Christopoulos A (2013) Nature Rev. Drug Discovery 12: 205–216
Santos R et al (2017) Nature Rev. Drug Discovery 16: 19-34
Thal DM et al (2018) Nature 559: 45-53



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Bek's greatest hits: An insight into her playlist for a fun and successful career

Prof Rebecca Moles

APSA Medallist: Goldfields Theatre, December 4, 2024, 8:50 AM - 9:40 AM

Biography:

Professor Rebekah Moles is a pharmacist academic from Sydney Pharmacy School, the University of Sydney. Her research focuses on medication safety, particularly for vulnerable populations and she is currently leading a large MRFF funded, trial in osteoporosis and falls reduction. Bek has had a long history in pharmacy practice research and education and attended her first APSA meeting in 1997 as a very young PhD student. She has been to so many APSA conferences since then, she has lost count. She has enjoyed sharing the APSA love with her own research students over many years and is a very proud supervisor of her past and current students. Bek is now an integral part of the APSA/PSA collaboration and helps with organising the APSA stream each year at the PSA conference. She is passionate about the pharmacy profession and building the next generation of pharmacists including pharmacist researchers and teachers.

There is a title or a line from a song about almost everything! Bek Moles will take you on a musical journey through the lows and highs of her career in pharmacy and share with you the soundtrack to her life.

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Therapeutic molecules to rectify aberrant RNA splicing

Prof Masatoshi Hagiwara

JPS Lecturer: Goldfields Theatre, December 4, 2024, 1:10 PM - 2:00 PM

Biography:

He graduated Mie University School of Medicine in 1984 and took Ph.D in Department of Pharmacology by finding the inhibitory mechanism of isoquinolinesulfonamide compounds on protein kinases in 1988. One of them, fasudil, was developed as a clinical drug to prevent vasoconstriction after subarachnoid haemorrhage. In the Salk Institute, he found that transcriptional attenuation following PP-1-mediated dephosphorylation of CREB and succeeded to identify CBP as the phosphorylated CREB binding protein. When he returned to Japan in 1993, he started his own laboratory in Nagoya University School of Medicine as Assistant Professor. He moved to Tokyo in 1997 as Professor of Medical Research Institute of Tokyo Medical and Dental University, and decided to try to decipher splicing code to cure genetic diseases. He moved from Tokyo to Kyoto University in 2010 as Professor and Chairman of Department of Anatomy and Developmental Biology, Graduate School of Medicine.

Deep-intronic mutations often distort splicing regulatory motifs and some intronic sequences are retained as exons, which are referred to as pseudo exon. In 2002, A single G→A intronic mutation (IVS4+919G→A) of α-galactosidase A (α-Gal A) gene was identified in a patient with cardiac Fabry disease who has the concentric left ventricular hypertrophy. The mutation promotes recognition of intronic 57-nucleotide sequence as a pseud exon in the a-Gal A transcript, which is not translated and subsequently leads to accumulation of of globotriaosylceramide (Gb3) in lysosomes of heart. Unexpected high prevalence of the cardiac variant Fabry mutation IVS4+919G→A was reported among both newborns (≈1 in 1600 males) and patients with

idiopathic hypertrophic cardiomyopathy in Taiwan. As enzyme replacement therapy is not so effective for the cardiac phenotype, we have started to screen synthetic chemicals with our splicing reporter system to look for a druggable small compound which can normalize the aberrant splicing of α-Gal A transcript. Newly found compound induced CLK1 activity, promoted phosphorylation of SRSF6, recovered normal splicing of α-Gal A mRNA, increased the enzyme activity, and reduced Gb3 amount in the patient iPS cells. The splicing therapy with chemical splicing modulators can be applicable for other inherited diseases such as familial dysautonomia and several types of long QT syndrome caused by aberrant splicing.