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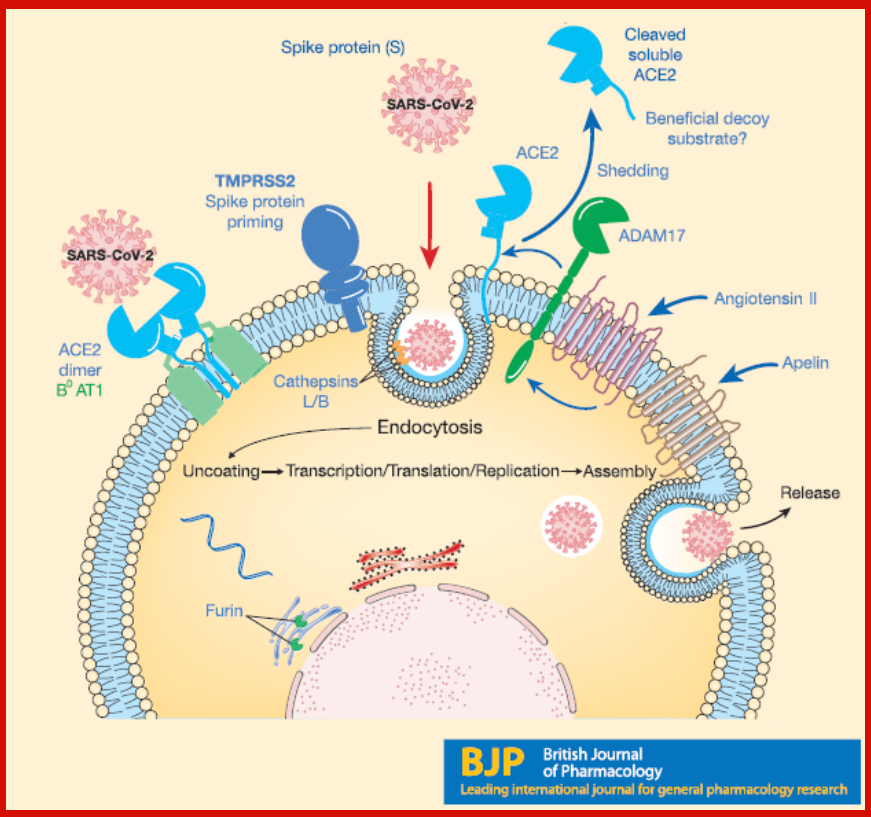
Pharmacology International

The Semi-annual newsletter from the Union of Basic and Clinical Pharmacology



In this newsletter

IUPHAR
INTERNATIONAL UNION OF BASIC AND CLINICAL PHARMACOLOGY

Pharmacology International is published bi-annually for members of IUPHAR.

Founded in 1959 as a section of the International Union of Physiological Sciences, the International Union of Pharmacology became independent in September 1965. The name was changed to the International Union of Basic and Clinical Pharmacology in 2006 to better reflect the composition of the membership.

IUPHAR's vision is To be the leading organization in the world that represents, promotes, and advances pharmacology and its contributions to the global biomedical and healthcare science.

IUPHAR, in collaboration with pharmacology societies from around the world, will support pharmacology research, education and their application to improve global health.

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PHARMACOLOGY INTERNATIONAL

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INTERNATIONAL UNION OF BASIC AND CLINICAL PHARMACOLOGY

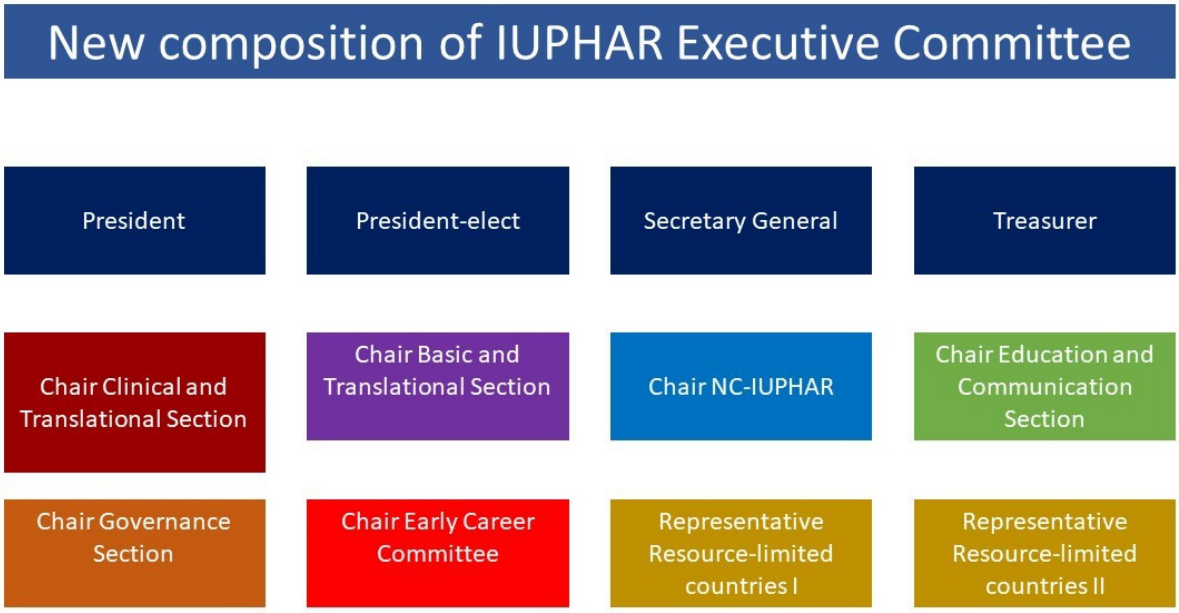
WELCOME FROM THE PRESIDENT

Dear colleagues,

The last issue of Pharmacology International was published in December 2020 under the impression of the Covid-19 pandemic, which greatly restricted many of us in our daily work. At that point it was not clear that a third wave would restrict public life even more. On the other hand, considerable progress has been made in vaccination in the meantime, so that increasing relief is currently possible. At the same time, more infectious SARS-CoV2 variants threaten the regained freedom. More about this in this issue.

However, IUPHAR used the time to significantly advance the governance review process. After consulting our main stakeholders, the draft of new statutes has been completed in accordance with Swiss association law and is being prepared for electronic voting by our delegates in the second half of August this year. The leadership of the member societies and all official delegates nominated for the Kyoto general assembly in 2018 will receive the documents for review in good time. Details of the operational business are set out in the Operating Manual. This can be requested from the office, if required.

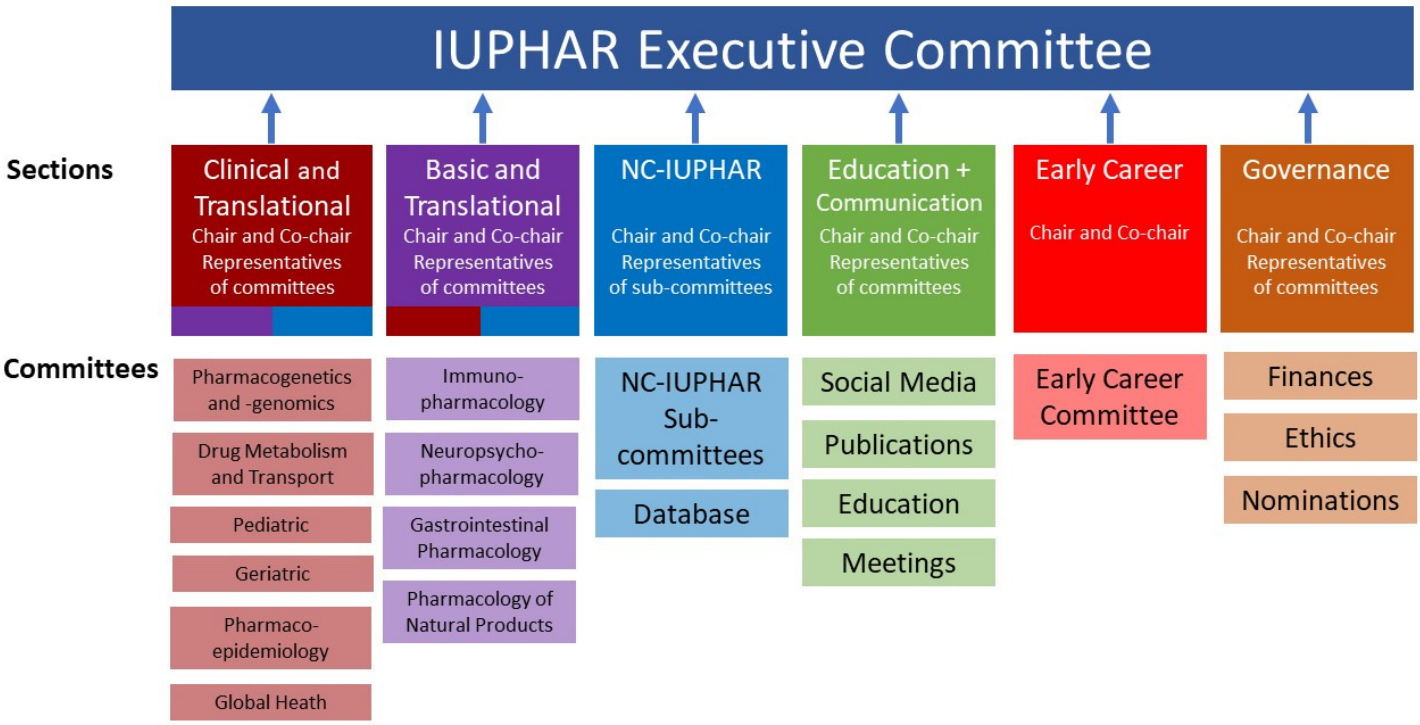
The new statutes, which would come into force immediately if approved, will result in significant changes in the composition and description of tasks of the IUPHAR executive board, the participation of the sections and their committees as well as the mode of election. In the future, the President will only have a term of two years, which is preceded by a two-year term as President-elect. All other members of the Executive Board will continue to be elected for four years, but this will be done with a time delay for half of the board. One half will be replaced every two years so that the continuity of activities is maintained. The Executive Committee members will be assigned to defined areas of responsibility (see figure).



WELCOME FROM THE PRESIDENT

The various scientific activities of the current sections and sub-committees (now called committees) are represented by the Chairs of the Clinical and Translational Section and the Basic and Translational Section. The activities of the committees will be regularly evaluated in the future by the Executive Committee. The chairman of the IUPHAR Nomenclature Committee will be permanently represented on the board. It is important to mention here that there should be a close link between the scientific sections; there is great emphasis to geographical and gender diversity and the representation of young scientists in the various sections.

The chairperson of the Early Carrier Committee is therefore also new to the board. Education and communication are also represented by a responsible board member, as well as a board member who accompanies the work structures, the governance process and ethical issues. In order to consider the geographical diversity and different degrees of resources of the members of the IUPHAR, two board members will dedicate their work to these issues. Figure 2 demonstrates the future composition, thereby considering the current scientific committees. Committees could be added or terminated.



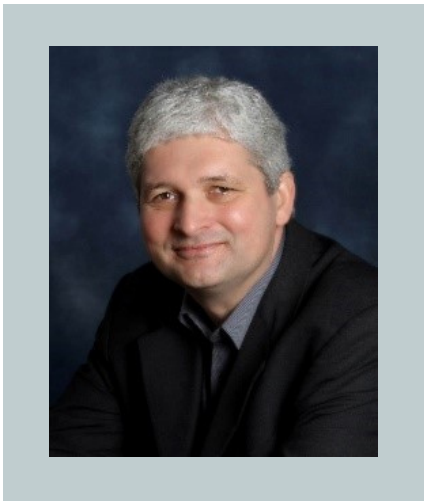
WELCOME FROM THE PRESIDENT

How to vote? Elections take place virtually every two years, the next is foreseen for June 2022. The positions that become vacant will be advertised. Member societies with full voting rights as well as and IUPHAR sections or committees (after consulting member societies) propose candidates for the individual positions of Executive Committee. In coordination with the EC, the nomination committee will draw up a short list. The leadership of the member societies first elect the officers and in a second ballot the other EC positions. The number of votes per member society is based on their size. The maximal numbers will be capped.

In order to enable continuous communication between the IUPHAR board and the member societies, there will be regular virtual meetings. The procedure for applying and electing future world congresses has also been revised and adapted to today's requirements. This will be presented in the next issue of Pharmacology International.

The entire board of IUPHAR is convinced that the new governance structure and statutes provide a solid basis for an efficient and future-oriented work of IUPHAR in close cooperation with its member societies.

With best wishes for a relaxing summer,



Dr. Ingolf Cascorbi

MEET IUPHAR'S NEW EXECUTIVE OFFICER

IUPHAR's new Executive Officer is LaTonya Jackson, MBA. Before joining Parthenon Management Group, LaTonya worked for the Alliance for Women in Media & National Association of Shell Marketers as a Dual Association Operations Manager. She graduated from the University of Kentucky with a bachelor's degree in Hospitality Management & Tourism, with a business minor and earned a master's degree in Business Administration from Sullivan University

In her spare time, LaTonya enjoys travelling, the beach, watching basketball and football, crafting, and learning new things! Her favorite sports team is the Kentucky Wildcats! She is passionate about St. Jude and Habitat for Humanity.

"I am excited to work for IUPHAR and meet members from across the globe. The study of pharmacology is fascinating and ever evolving. I look forward to learning all I can and am excited for WCP2023. I hope to see you all there!"

LaTonya Jackson, MBA

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WORLD PHARMACOLOGY DAY

by Dr. Caroline Samer

The International Union of Basic and Clinical Pharmacology (IUPHAR) has launched World Smart Medication Day on May 6, 2021, to raise awareness on the safer and more effective use of drugs and foster clinical pharmacology development.

Unsafe medication practices and medication errors are a major cause of preventable injury and harm in healthcare systems worldwide. Errors can occur at various stages of the medication use process. Five to 10% of hospital admissions may be due to adverse drug reactions and up to 50% may be preventable. Adverse drug reactions increase exponentially in patients taking 4 or more medications and globally, the WHO estimates that the cost associated with medication errors is US$42 billion per year.

Clinical Pharmacology is a critical discipline for managing these drug-related problems as it involves all aspects of the relationship between medications and humans. These clinical pharmacologists have as their primary goal that of improving patient care, directly or indirectly, by developing better medicines and promoting the safer and more effective use of drugs. The COVID-19 pandemic has reminded us how critically important this is.

Joint actions and activities were carried out around the world on World Smart Medication Day to highlight the importance of safe and rational use of drugs. Eighteen national and international professional societies participated. National webinars were held in Spain, Brazil, Nigeria, China and Sri Lanka with great success. An international IUPHAR webinar was organized with the support of WHO. Ms Alpana Mair, representative of the WHO Flagship Programme on Patient Safety, gave a presentation on the WHO's third global patient safety challenge: the "Medication Without Harm" initiative, which aims to reduce severe avoidable medication-related harm by 50% globally by 2022.

An international poster competition was open to medical, pharmacy or pharmacology students and approximately 400 posters were received from all 5 continents. The theme focused on Medication Without Harm and the winners were selected at the national level. The ten best posters were selected by the IUPHAR clinical division. Three IUPHAR prizes were awarded. The winners and best posters were announced during the international webinar on May 6.

The winners of the best general posters winners (ex aequo) were Felipe Gomes from Brazil and Maria Davila, Marta Fernandez, Pedro Fernandez, Maria Gomez, and Olga Gonzales from Spain. The best scientific poster was awarded to Mitchell R Redston from Australia for his poster entitled "Patterns of inappropriate polypharmacy among odler inpatients with dementia when treated under different clinical specialties: a muti-centre cohort study". The three winners gave a presentation during the international webinar.

World Smart medication day will be held annualy on the first Thursday in May. The date for 2022 will therefore be May 5, 2022.

IUPHAR and its clinical division would like to thank all the participants, students and professional societies who led to the success of this day!

Best posters entries can be viewed on the IUPHAR website: https://iuphar.org/clinical-division/iuphar-international-students-poster-competition/

2021 EACPT LIFETIME ACHIEVEMENT AWARD GOES TO PROFESSOR KIM BRØSEN FROM DENMARK

The EACPT is delighted to announce that the 2021 Lifetime Achievement Award of the European Association of Clinical Pharmacology and Therapeutics will go to Professor Kim Brøsen from Denmark.

The Award, which includes the EACPT silver medal, will be announced to Professor Brøsen on Tuesday 29th June 2021 during the upcoming virtual EACPT Focus Meeting. Prof. Brøsen will be formally invited to do the Award Lecture next year in the 2022 EACPT Athens Congress.

Kim Brøsen went through a remarkable career as physician and scientist whose discoveries and scientific results have fundamentally contributed to clinical pharmacology and its development in the last decades.

To read full article, visit:

https://www.eacpt.eu/2021-eacpt-lifetime-achievement-award-goes-to-professor-kim-brosen/

!!WARNING!!

Beware of Other Pharmacology Event Invitations

Recently, there have been email invitations sent to attend various world pharmacology events that are similar but not a genuine IUPHAR event. IUPHAR never sends communications through third parties, and we suggest you access information directly from the IUPHAR website. When in doubt, contact IUPHAR headquarters at admin@iuphar.org or 1-615-432-0097.

TOWNHALL REPORTS

The IUPHAR executive committee has had two Town Hall Meetings with the seven biggest pharmacology societies (ASCEPT, ASPET, BPS, CNPHARS, IPS, JPS, SIF) to explain proposed governance changes and discuss how to forward pharmacology. This forms part of our expanded remit of increasing communication with member societies. We also plan an annual meeting for all the pharmacological societies which wish to participate.

Discussion Topics

Governance and elections. The Kyoto 2018 congress was referenced as the kick-off to the governance work that has been underway the past two years. Highlights of this work were the main focus of these meetings and are explained in the President's address in this issue of Pharmacology International.

Clinical Division and World Smart Medication Day - C. Samer presented slides on the 1st World Smart Medication DAY (WSMD) held on 6 May 2021. This is presented earlier. Eighteen professional societies participated, and multiple webinars were held worldwide in connection with WSMD. A poster competition was held, and three winners were selected by IUPHAR. WSMD will be held annually on the 1st Thursday of May. 5 May 2022 will be the next WSMD.

NC-IUPHAR Updates - S. Alexander presented an overview of NC-IUPHAR and its main functions and connections with BPS and ASPET. The major guides were highlighted (IUPHAR/BPS guidetopharmacology.org; Guidetoimmunopharmacology.org; guidetomalariapharmacology.org). NC-IUPHAR has multiple expert subcommittees on receptor systems and sites for drugs, and the international representation on these committees will be reinforced. The main objectives of NC were reviewed, which include issuing guidelines for nomenclature and making the IUPHAR database freely available worldwide. Governance work within NC-IUPHAR was also reviewed.Funding for sustaining NC-IUPHAR continues to be a challenge. Recent NC-IUPHAR virtual meetings were discussed.The November 2021 NC-IUPHAR meeting may be a hybrid meeting, partly face-to-face in Paris, partly virtual.

Early Career Research Committee (ECR) - I. Cascorbi thanked C. White and A. Aubdool for their work on the ECR Committee, formed in 2018, which has representatives from 14 countries, and a member on the executive committee. ECR will be represented on all the future IUPHAR subcommittees. There are many ongoing ECR activities, including a survey on the different challenges faced by ECRs around the world.

TOWNHALL REPORTS

Regional Meetings

PharfA Meetings. Pharmacology for Africa (PharfA) was created in 2008, to federate Africa's pharmacological societies prior to the CapeTown World Congress in 2014. IUPHAR and PharfA have had three monthly teleconferences since 2014 and there has been IUPHAR support for the All Africa congresses, held every two years. The next meeting will be in September, hosted by the Kenyan Pharmacology society. Ways of helping pharmacology in Africa were highlighted. There are multiple issues facing African pharmacology, including difficulties with infrastructure. Kelly Chibale presented H3D, the main drug discovery centre in Africa, based in CapeTown, with a main focus on malaria. IUPHAR has therefore signed a memorandum of understanding with H3D supporting African drug discovery. There has been solid progress with IUPHAR supporting PharfA in recent years and these types of activities will continue.
The two scientific pharmacology meetings in Africa, in September (All Africa meeting) and October (the West African Society meeting), are great opportunities for the future development of pharmacology.

Latin American Meetings. G. Suarez-Kurtz and MS have organised two meetings this year uniting the pharmacology societies in South America, together with the Spanish and Portuguese societies, where we discussed approaches for COVID-19 (the societies give advice to government), and pharmacology education, where websites such as the Pharmacology Education Project, have proven successful. An area of development is how to extend the websites into different languages, and how to obtain synergies between local initiatives. There will be two upcoming virtual meetings organised by Chilean and Brazilian societies (in November and December). These meetings will be opportunities to bring together these societies to further progress these issues and how to promote more interactions.
Subsequently, IUPHAR has also made contact with Alicia Barcena, executive secretary of ECLAC/CEPAL, the umbrella organization linking Latin America to the UN, also linked to the PanAmerican Health Organisation: her team wish to be an observer at meetings in the future.

IUPHAR proposes to organise similar meetings with Asian societies.

World Congress of Basic and Clinical Pharmacology, 2023 Scotland - Register your interest

In 2023, the global pharmacology and therapeutics community will unite in Glasgow, Scotland for the World Congress of Basic & Clinical Pharmacology (WCP2023) – and you are invited. WCP2023 is your passport to a world of cutting-edge science and unmissable career opportunity, in one of the most vibrant cities on Earth. Learn more and register your interest.

BRITISH PHARMACOLOGICAL SOCIETY

IUPHAR INTERNATIONAL UNION OF BASIC AND CLINICAL PHARMACOLOGY

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ECR UPDATE

MEET VOLKER M. LAUSCHKE

Biosketch. Volker M. Lauschke (V.M.L.) is Associate Professor and group leader in Personalized Medicine and Drug Development (since 2017) at Karolinska Institutet (KI), Stockholm, Sweden and Associate Director of the Institute of Clinical Pharmacology (IKP) in Stuttgart, Germany (since 2021). Furthermore, he is Director of the Micro- and Nanoengineering Facility at KI (since 2018). He is a board member of the Swedish Society of Medicine (Section of Pharmacology) and a member of the KI steering group of the International Network Medicine Consortium (INMC). The aim of the research group is to improve drug discovery and development by integrating 3D cell culture systems of primary human cells, microfluidics and comprehensive molecular profiling technologies to discover novel therapeutic strategies for inflammatory conditions (NASH), infectious diseases (COVID-19 and hemorrhagic fevers) and complex metabolic diseases (type 2 diabetes). In addition, the group uses population-scale genetics and machine learning tools to map the ethnogeographic variability in genes involved in drug absorption, distribution, metabolism and excretion, as well as drug targets with a specific focus on the contribution that rare genetic variations play in drug response and toxicity and how this information can improve personalized medicine and precision public health.

V.M.L. is an editorial board member of 10 journals in the areas of pharmacology, precision medicine and genetics, and has authored over 100 papers in peer-reviewed journals. Furthermore, he is the recipient of multiple awards in the area of genetics, pharmacology and drug discovery, including the Malin and Lennart Philipson Prize 2016 and the AAPS High Impact Award 2020. Besides the academic work, he is co-founder and CEO of HepaPredict AB, a biotech company offering 3D human liver models for drug discovery and development, as well as co-founder and CSO of PersoMedix AB, offering services for personalized drug response predictions.

View of pharmacology in Sweden. While a relatively small country, Sweden has a rich history in in both clinical and basic pharmacological research. The Department of Clinical Pharmacology at Karolinska Institutet in Stockholm was among the first to be established worldwide and the first professorships in clinical pharmacology were established in Sweden already in the early 1970s. Similarly, Sweden contributed important discoveries in basic pharmacological research, including the discovery of prostaglandins (Nobel Prize in Physiology or Medicine for Sune Bergström, Bengt Samuelsson and Sir John Vane in 1982) and the identification of the molecular biology and biochemistry of signal transduction in the nervous system (Nobel Prize in Physiology or Medicine for Arvid Carlsson, Paul Greengard and Eric Kandel in 2000) that were instrumental in paving the way for the development of prostaglandin antagonists, such as nonsteroidal anti-inflammatory drugs and corticosteroids, dopaminergic agents and selective serotonin reuptake inhibitors.

In my experience over the last seven years, efficient collaborations between disciplines, as well as between researchers and clinicians, lie at the heart of successful pharmacological research in Sweden. Current research commonly pairs pharmacological studies with expertise and methods in biochemistry, cell biology, physiology, as well as genetics and genomics. From a personal standpoint, particularly the inter-disciplinary approaches integrating pharmacogenomics and translational pharmacology were the factors that convinced me to move my academic work to Sweden. Furthermore, Swedish pharmacology is very application-oriented and open towards the commercialization of findings. Combined, these features put pharmacological research in Sweden into a globally competitive position and promise that significant discoveries that contribute towards improved human health will also be made in the years to come.

ECR UPDATE

MEET HONG YONG PEH, PH.D

Biosketch:
Dr. Hong Yong Peh is currently a Postdoctoral Research Fellow at Harvard Medical School / Brigham and Women's Hospital (HMS/BWH), with co-appointment as a Senior Tutor at National University of Singapore (NUS). He obtained his Ph.D. in medicine at NUS in 2017 and was the valedictorian for the medical school graduating cohort. He was awarded a co-joint Postdoctoral Fellowship at HMS/BWH and NUS, with a subsequent appointment at NUS medical school upon completing his fellowship. During his Ph.D. candidature under Professor Wai-Shiu Fred Wong at NUS, Dr. Peh's doctoral thesis "Vitamin E Isoform γ-Tocotrienol Alleviates Asthma and COPD" demonstrated that a specific isoform of vitamin E (γ-tocotrienol) was potent in attenuating both inflammation and oxidative stress in allergic and destructive respiratory diseases – asthma and chronic obstructive pulmonary disease (COPD) respectively. The efficacy of γ-tocotrienol was comparable, or in some instances superior than, clinically prescribed corticosteroid prednisolone. His current research as a postdoc under the mentorship of Professor Bruce D Levy and Professor Charles Serhan at HMS/BWH, focuses on the resolution of lung inflammation and injury. He has identified several endogenous specialized pro-resolving mediators (SPMs) for innate and adaptive immune responses in the lung, such as lipoxins and resolvins. In addition, Dr. Peh is investigating molecular signaling pathways for these mediators by defining their receptors, intracellular signaling pathways, cellular targets, and functional responses. Interestingly, these SPMs seem to target only a specific population of "inflammatory" eosinophils during allergic inflammation. Using the murine air pouch model, which is similar to a skin blister in humans, he is exploring a novel mechanism of resolution of inflammation, where a local site of inflammation has its inflammatory cells egress into the systemic circulation and undergoes clearance at a secondary site. Outside of academia, Dr. Peh is under the mentorship of Nobel Laureate Sir Richard Roberts, to discuss on microbiome and the future of biomedical sciences.

Dr. Peh also serves as the Young Investigator Chair in the immunopharmacology section of IUPHAR, as well as a committee member of Early Career Investigators of IUPHAR. He is an editorial board member and reviewer of >10 journals in the areas of pharmacology, immunology, and oxidative stress, and has authored >20 peer-reviewed journals (H-index: 15). He received >10 awards, was invited to 3 summits with Nobel Laureates, and had presented his work in multiple international conferences.

Challenges/advice to other ECR:
As a former patient of childhood asthma and sitting out of sports and games in his early years, I got intrigued into how the pathobiology of airway diseases and hope to discover novel therapies for respiratory diseases. As an ECR, the obstacles I had to overcome were 3-pronged:
(1) research and publication – having a career in research is a long-term project, so it would be wise to be systematic and organized. I had regular updates and meetings with my mentors to ensure the projects were on the right track, as well as troubleshooting for both technique and technical issues that arose.

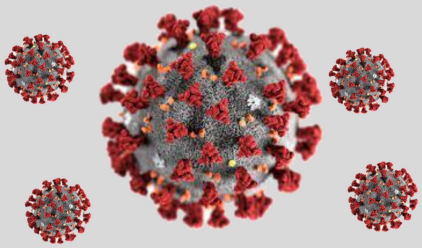
ECR UPDATE

(2) networking and career mentor(s) – Being prepared and knowing the criteria for the next steps in your career would certainly benefit you with distinct goals. When I was a doctoral student, I began finding out several postdoctoral fellowships in my 2nd year, and started preparing for them. Most of the fellowships criteria was to travel overseas, which prompted me to expand my networking at both local/international conferences. Besides conferences specialized in your field of research, there are Nobel Laureates science summit which discuss on the future of science. There were wonderful opportunities to find career mentors – who guide you on your overall career, rather than your own research per se. These are useful connections to obtain several recommendation letters in the subsequent applications of your academic career.
(3) scholarship/fellowship/funding – following up on being prepared, one key aspect lies in funding. It takes months, sometimes up to a year, to receive news if your fellowship/grant application had been approved, so it is pertinent to find out the criteria and apply in advance. In my relatively short experience of 9+ years (since I started graduate school in 2012), what sets you apart from your peers or other applicants for the same fellowship/grant/award besides your research publications, lies in your preparedness and track record of attaining them.

Prediction in my research field:
The average respiration rate for an adult is 12–20 breaths per minute, which constantly exposes the lungs to allergens, harmful particles, bacteria and viruses. A recent and ongoing battle against SARS-CoV2 which drastically affected our way of life in the past year, proved that pulmonary research is one of the key areas of research. It is critical to discover novel therapies to control the various respiratory diseases, however, most treatments of today provide symptomatic relief or delay disease progression. Using corticosteroid or non-steroidal anti-inflammatory drugs can reduce inflammation, but they need not necessarily treat the underlying pathogenesis of the diseases, and is prone to secondary infection due to systemic suppression of inflammation in the host. The discovery of endogenously produced specialized pro-resolving mediators (SPMs) helps to promote the resolution of inflammation, while leaving the host with intact immunity against opportunistic pathogens. The resolution of inflammation drives the lipid mediator class switching from prostaglandins/leukotrienes to lipoxins and other SPMS, which promotes apoptosis of inflammatory cells, macrophage efferocytosis of neutrophils and overall tissue recovery. Inflammation is involved in almost every human disease, which is why targeting the resolution of inflammation will be useful clinically.

Pharmacology in Singapore:
The NUS school of medicine was established in 1905 when Singapore was still part of the British colony. It had stood strong for the past 116 years and has evolved with time to be one of the top universities internationally (ranked 11th in QS Top Universities 2021). As there are more advances in medical research, it is difficult to not cross into other field of research as a pharmacologist (eg: investigating the pathogenesis of disease involves both immunology and pharmacology; targeting receptors and their ligands involves biochemistry and pharmacology, etc). As such, while a staff may be housed in a specific department like pharmacology department, research programs are setup to facilitate better collaboration between research scientists and clinician scientists in real-time (eg: asthma research which brings scientists from multiple disciplines such as pharmacology, immunology, physiology and biochemistry together). NUS has a wide repertoire of Professors from many countries, so it is easy to find connections to many other universities internationally. Personally, I am looking forward to bringing what I had discovered during my postdoc at Harvard Med back to NUS, and open a niche of my own research field. I hope to setup my lab targeting respiratory diseases, expanding the discovery of SPMs, resolution of inflammation and lipidomics analyses of various SPMs level in different diseases.

COVID-19 UPDATE



The impact of COVID-19 on research, vaccines and drugs: a key role for pharmacology

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Michael Spedding

Francesca Levi-Schaffer

Therapeutic research and healthcare will be profoundly changed by the SARS-CoV-2 virus, in multiple ways and it has already changed the way medical research is perceived by the public. Priorities have shifted massively. Hopefully, these changes will be long-lasting, because lessons from SARS-CoV-1 were scarcely enacted to prepare the world for SARS-CoV-2. Future viral outbreaks threaten, as do antibiotic-resistant bacteria. This article is not a definitive review, concentrating on issues of pharmacological interest.

1. IUPHAR and the response of the world's pharmacology societies

The arrival of the COVID-19 pandemic occurred as IUPHAR was changing its governance procedures to be more interactive with the world's pharmacological societies. The IUPHAR website (https://iuphar.org/) shows how the societies have spread information and supplied expert advice to their respective governments. Pharmacology societies around the world have advised their respective governments on the course of action to follow. Where possible this advice is listed on iuphar.org. The nomenclature committee of IUPHAR (NC-IUPHAR) quickly issued a roadmap for targeting drugs at SARS-CoV-2 and COVID-19, listing the potential sites of therapeutic intervention (Alexander et al, 2020; https://guidetopharmacology.org), and keeps a list of the drug targets, and drugs in development. The clinical division has issued guidelines for drug development for COVID-19 (https://iuphar.org/) and we held a review meeting of the Chinese experience for treating COVID-19, which is also on the web site. IUPHAR is a non-governmental organisation (NGO) to WHO. However, IUPHAR itself has too small a central staff to keep on top of the >91,000 articles on SARS-CoV-2 published in Pubmed (as of end June 2021). There are many more articles published in biological archives prior to peer review, and whereas this has been hailed as progress, it also lead to several clinical trials of drugs which were subsequently found to be inactive or even deleterious.

COVID-19 has underlined the importance of the links between pharmacology and immunology. NC-IUPHAR had won a major Wellcome grant to produce the https://www.guidetoimmunopharmacology.org/ database listing all the immunological drug targets and IUPHAR had signed a memorandum of understanding with the International Union of Immunological Sciences (IUIS) supporting immunopharmacology, linking IUIS, NC-IUPHAR, ImmuPhar, IUPHAR's immunopharmacology group (chair Francesca Levi-Schaffer). Thus IUPHAR's free on-line pharmacology education project (PEP) directly links to immunopaedia https://www.pharmacologyeducation.org/pharmacology/immunopharmacology. Thus both basic pharmacology and immunology education are only a click away via www.guidetopharmacology.org
IUPHAR welcomes initiatives with other societies to expand these sites, and also to have web sites in languages other than English. Furthermore, we try to expand into new healthcare areas, having obtained a grant from the Medicines for Malaria Venture, backed by Bill Gates, for https://www.guidetomalariapharmacology.org/. Pharmacological societies can have IUPHAR as a partner in obtaining grants about critical health care issues.

2. How COVID-19 has changed science

Viral pharmacology is complicated and simple in vitro tests of viral replication insufficient to advance drugs into the clinic. Yet there are few animal models and for those which exist, access is difficult because of the necessity of biological containment. Furthermore, the closure of laboratories not working directly on SARS-CoV-2 has been very serious, particularly as the virus uses many host cell mechanisms to replicate (see below) and research has almost stopped on these mechanisms. Stopping all 'non-essential' research will prove to have been a very wasteful idea, as rebuilding stocks on transgenic animals for other critical diseases, may take years. Already, patient groups with rare and severe diseases feel left behind, as the research that they fund was stopped to prevent SARS-CoV-2 spreading. Thus, many scientists have switched subjects to respond to COVID-19, resulting in a cacophony about drugs for COVID-19.

The epidemic has shown that the fragility of human healthcare, even in countries which claimed excellence in the subject. It reminds us that pandemics happen and cannot be predicted. Nevertheless, the SARS and MERS epidemics were warnings, and greater heed should have been taken of them. Furthermore, considerable harm has been made by non-scientific touting of 'medical advances' which are unjustified. In this respect, IUPHAR has produced guidelines for clinical trials, but Governmental and WHO recommendations must be given regarding priority for testing if progress is to be made in such emergencies.

Tummino et al. [1] assessed that 1974 chemical agents have in vitro activity against SARS-CoV-2, and there now more than 6000 clinical trials listed in ClinicalTrials.gov associated with COVID-19, with more than 370 targeting hydroxychloroquine and chloroquine, which globally, have been found to be inactive. However, access to reliable animal models for testing is very restricted, and was not available during the early stages of the pandemic, and even now it is limiting. More pharmacology was needed in the assessment of the many drugs proposed for clinical trials. Tummino et al. [1] showed how properties associated with drug-induced phospholipidosis were responsible for the vast majority of agents being false positives. This is because the highly lipophilic and basic nature of many of these drugs (eg table 1 taken from [1]) causes membrane accumulation which modifies lipid processing, which is also involved in viral replication – but which does not translate in vivo, except perhaps in systemic toxicity. Thus, the authors correlated the physicochemical properties associated with phospholipidosis, (and also performed phospholipidosis assays) to in vitro antiviral potency. Phospholipidosis is associated with lysosomal dysfunction. SARS-CoV-2 uses intracellular membranes in endoplasmic reticulum/Golgi to make its envelopes and egresses via lysosomes [2,3] hence the links between drugs accumulating in membranes and causing phospholipidosis.

This type of problem is well known in pharmacology for at least 30 years. Functional and radioligand-binding studies may reflect the highly lipophilic nature of many of the drugs, which are in equilibrium with their site of action from cell membranes rather than the extracellular fluid. Mason et al [4] showed that lipophilic dihydropyridines and other calcium antagonists could accumulate 3000 (nifedipine) to 19000 (amlodipine)-fold in cell membrances. This high concentration in the membrane indicates that the apparent affinity constant (Kapp) should be modified by the membrane partition coefficient KPmem to give the true local equilibrium constant, Ka, which may be four orders of magnitude lower than the constant calculated from the concentration in the aqueous phase [5]. Furthermore, the different lipid/aqueous approaches of drugs in several systems result in real functional differences, with lipophilic agents showing slow wash-out and kinetics [1,6].

Thus many of the drugs in Table 1 have been found to be false leads for the treatment of COVID-19, which may have cost ~6bn$ in clinical trials1 in an emergency pandemic. What price good pharmacology? The choice of which clinical candidates to trial is therefore critical. The RECOVERY trial in the UK, which showed the protective effects of dexamethasone, succeeded because of simple clear end-points with mortality being critical. In contrast chloroquine was tested in 250 studies with >88,000 people, and no real benefit. The link between good preclinical pharmacology and simple clinical trials is crucial. The appropriate use of animal models may yield good insights into which drugs are beneficial, in host protection rather than antiviral effects [7].

Thus IUPHAR has been associated with:

Guidelines for drugs for COVID-19

- The drug must work against the virus in cells or animal models* at doses which are relevant for humans.
- The amount of drug reaching the cells and organs affected by the virus must be adequate to inhibit replication of the virus, block entry or exit, and/or reduce inflammation.
- There is the need to have a good understanding of how the virus infects and multiplies within the body and how this relates to the clinical features of COVID-19.
- The information from the above 3 principles should be used to define the optimal doses and duration of therapy (or therapies when more than one drug is used).
- Well-designed trials must be undertaken to show that the drug works in treating the disease and is safe.

Appropriate reviews of data are critical, but there is an issue with confidentiality, as pharma and biotech companies frequently choose not to publish all their data. Furthermore, there is little commercial value in repurposed drugs (and value is needed to get the funds to advance them), unless use patents are taken, and it takes some time to develop the data, and keep the data confidential. Thus there is a real divide between publicly-funded research (where grants do not address the infrastructure of drug development of generics) and privately-funded advances of new compounds – but where the development time-lines are totally inappropriate for a sudden pandemic.

Table1. Lipophilic drugs liable to cause phospholipidosis, which have been reported to be active in reducing SARS-CoV-2 replication in vitro (from [1]).

Amiodarone		Chlorprothixene		Fluoxetine		Opipramol		Tamoxifen
Amodiaquine		Clemastine		Flupenthixol		Promethazine		Thioridazine
Astemizole		Clomipramine		Fluphenazine		Propafenone		Tilorone
Bix01294		Clomiphene		Haloperidol		Quinidine		Trifluoperazine
Cepharanthine		Desloratadine		Loperamide		Raloxifene		Trimipramine
Chloroquine		Ebastine		Maprotiline		Sertraline		Triparanol
Chlorpromazine		Fendiline		Nortriptyline		Spiperone		

Variants

SARS-CoV-2 like other viruses may show multiple mutations (>18,000), and the WHO has issued nomenclature for variants of concern and of interest (https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/), with many of the variants of concern showing mutations in the spike protein which may increase affinity for the viral targets in the host such as ACE-2, and consequently increased transmissibility, and a slight reduction in the protection afforded by some vaccines. The pharmacological conclusions of increasing affinity have not been sufficiently emphasised. It would imply that a reduced number of virions would be needed to cause a similar degree of infection, and that reinfection of cells may occur with reduced viral load. Again, animal models linked to human tissue sampling have shown that the olfactory neuroepithelium is a major site of infection with persistence, linked to anosmia and ageusia: the long duration of viral transcripts was attributed to reinfection [7,8]: it will be interesting to see if high affinity variants have a longer duration of action.

Vaccines

Vaccines in contrast have shown remarkable progress, with mRNA vaccines being developed in a very short time: the pandemic has ensured a revolution in vaccine development, which has not been paralleled in drug development. Agencies such as the Coalition for Epidemic Preparedness Innovations (CEPI) was launched to develop vaccines for future epidemics, with a 3.5M bn$ budget for future epidemics. The progress with vaccines for SARS-Cov-2 has been reviewed in detail [9–16].

Most of the developed vaccines notwithstanding their composition are effective when given in two shots both in preventing the disease and, if infected, in having a less severe one.

Prevention of severe disease (including hospitalization, intensive care admission, and death) is indeed an important objective of any vaccination program.

Without any exception, all the anti-SARS-CoV-2 vaccines can induce an injection-site tenderness and rarely fatigue, headache, muscle pain, nausea and diarrhea.

SARS-CoV-2 Vaccines may be gene-based (DNA or RNA) or protein based. The messenger RNA (mRNA) codes for the spike surface protein of SARS-CoV-2 with the Moderna and Pfizer–BioNTech vaccines also using the mRNA nucleotide pseudouridine instead of uridine to avoid inflammatory reactions to foreign mRNA via TLRs. This is a licensed technology and Curevac developed a uridine mRNA vaccine which has not proven so effective in the first clinical trial. The spike protein-coding sequence of SARS-CoV-2 was published on January 10, 2020 and Moderna had a vaccine just 42 days later, showing how fast this technology can be enacted. As the mRNA vaccines can translate the spike proteins in the cytoplasm, they may be safer rather than DNA-based viruses, in the nucleus. The RNA must be highly purified to prevent innate immune responses. Encapsulation in proprietary lipid particles is essential to avoid plasma RNAses. Intramuscular administration allows translation of the spike protein in the muscle and also a local concentration of antigen-presenting cells (APCs). However, a less clear area is whether other tissues may be targeted after i.m. injection, and whether function may be altered.

The AstraZeneca, Novavax and J&J vaccines are all DNA based vaccines. The AstraZeneca is a monovalent vaccine composed of a single recombinant, replication-deficient chimpanzee adenovirus vector encoding the peptide sequence of the S glycoprotein of SARS-CoV-2. The SARS-CoV-2 S immunogen in the vaccine is expressed in the trimeric pre-fusion conformation; the coding sequence has not been modified in order to stabilise the expressed S-protein in the pre-fusion conformation.

As an extremely rare side effect it has shown to cause blood clots with thrombocytopenia for people who in the past had thrombotic events and are under 60 years old.

The Novavax vaccine consists of a recombinant nanoparticle spike protein and Matrix-M adjuvant.

The Johnson & Johnson vaccine was >90% effective at preventing COVID-19 in a large US trial.

The SputnikV vaccine is a modified replication-defective human adenovirus of a different serotype (Serotype 26 for the first component and serotype 5 for the second), modified to include the protein S-expressing gene of the SARS-CoV-2 virus.

The SinoVac and SinoPharm are inactivated Sars-Cov-2 viruses based vaccines and contain adjuvant.

The rapid availability and implementation of vaccines has been a remarkable scientific success story, marred only by fake news on social media: scientists have to stand up to ensure that the remarkable progress can be continued.

The future of scientific meetings will no doubt change, but the advantages of teleconferencing have been made clear. This will change the way scientists will work, for ever, and may be an opportunity for IUPHAR to coordinate and facilitate worldwide research via virtual meetings, and also education.

How scientific advice will change society

The failure to take on board scientific advice early on has had an immense impact on the overall death rates between countries and the total viral load in a particular country. However, scientific advice must be carefully weighed and approved, usually by an expert committee, as some individual scientists may advance personal agendas. Nevertheless, scientists must act quickly to ensure that science continues to be seen as a critical human endeavor, and an excellent career path for young people.

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UPCOMING EVENTS OF IUPHAR MEMBER SOCIETIES

September 7-9, 2021
Pharmacology 2021, three-day virtual event made up of scientific sessions, interactive workshops and social activities.
https://www.bps.ac.uk/news-events/events-calendar/2021/pharmacology-2021

September 15-17, 2021
Virtual 7th All African Congress of Pharmacology (ACP 2021), Pharmacology driving research, innovation and practice
www.acp2021.kesobap.com

September 27-28, 2021
Pharmacokinetics & Pharmacodynamics (Training Workshop) in Liverpool, UK, a two-day training workshop covering the fundamental aspects of pharmacokinetics and pharmacodynamics.
https://meetings.bps.ac.uk/bpsevents/frontend/reg/thome.csp?pageID=34564&eventID=59&traceRedir=2

October 18, 2021
Pharmacology & Drug Discovery (Training Workshop), a virtual training workshop that will provide you with a broad overview of the process of drug discovery and the role of the pharmacologist
https://meetings.bps.ac.uk/bpsevents/frontend/reg/thome.csp?pageID=34564&eventID=59&traceRedir=2

October 22-23, 2021
7th Congress of AsCNP 2021, Advances in Neuropsycgopharmacology: Spotlighting on progress and beacons to the future
https://ascnp2021.pharmconf.org/

October 26-30, 2021
42nd Annual Conference of the West African Society for Pharmacology (Zaria 2021),

October 27-30, 2021
11th ISCTICO-HUPHAR 2021 Conference, in Pecs, Hungary, a symposium on cell/tissue injury and cytoprotection/organ protection (ISCTICO), joint meeting of the Hungarian Society for Experimental and Clinical Pharmacology (HUPHAR) and IUPHAR GI Section.
https://huphar.org/isctico2021/

POSTPONED to December 5 – 8, 2021
8th European Congress on Pharmacology organized by the Federation of European Pharmacological Societies (EPHAR) in Prague, Czech Republic
http://www.ephar2020.org

March 29 – April 1, 2022
3rd World Conference on Pharmacometrics 2022 (WCoP2022), hosted by the University of Cape Town and Pharmacometrics Africa under the auspices of the World Conference of Pharmacometrics Committee (WCoP) in Cape Town, South Africa
www.wcop2022.org

April 24-28, 2022
The 20th Meeting of the International Society for Serotonin Research (ISSR) in Cancun, Mexico
https://www.serotoninclub.org/

July 2-5, 2023
WCP 2023 - 19th World Congress of Basic & Clinical Pharmacology in Glascow, UK, the British Pharmacological Society looks forward to welcoming attendees to the World Congress of Basic & Clinical Pharmacology in 2023.
https://www.bps.ac.uk/news-events/events-calendar/2023/wcp-2023-19th-world-congress-of-basic-clinical

As a reminder, the IUPHAR Office is here to assist our member societies in sharing information about their meetings, conferences, workshops, congresses or any other event that may be of interest to pharmacologists. Please share by emailing the title, date(s), city, country and event website to the IUPHAR Administrative Office at admin@iuphar.org.

PHARMACOLOGY EVENTS

Reach the global community at the heart of pharmacology – Last webinar slots remaining

The annual meeting of the British Pharmacological Society brings together members of the pharmacology community for three packed days of engaging sessions, poster presentations and networking opportunities. We have two great offers for Industry to partner with us at Pharmacology 2021. Please contact victoria.giordano@bps.ac.uk for further information or take a look at our partnership prospectus now!

Spotlight 15 sessions

- 15 min session
- includes Q&A
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- £950

Industry Webinars

- 45 mins including Q&A
- featured in programme
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- including banner advert
- exclusive one per day
- £1500

ACPKENYA2021
AFRICAN CONGRESS OF PHARMACOLOGY

Virtual 7th All African Congress of Pharmacology (ACP 2021)

Theme: Pharmacology driving research, innovation and practice

Sub-Theme: Promoting Quality Health Technologies and Services in the Covid-19 Era.

Date: 15th - 17th September 2021

Precongress Dates: 13th - 14th September 2021

Congress Topics

- Pharmacovigilance
- Drug Discovery & Development
- Traditional & Herbal Medicine
- Clinical trials and Bioethics
- Non communicable Diseases
- Pharmacometrics
- Pharmacology Education & Mentorship
- Biotechnology & Innovation
- Infectious Diseases
- Antimicrobial Stewardship
- Clinical Pharmacology & Therapeutics
- Pharmacology and Society
- The Omics

Event is CPD Accredited

REGISTRATION FEE

Standard	USD 30
Post Grad (Master)	USD 20
Under Grad	USD 5

ABSTRACT SUBMISSION

www.acp2021.kesobap.com
Deadline 30th July 2021

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7TH CONGRESS OF AsCNP 2021

Asian College of Neuropsychopharmcology

Advances in Neuropsychopharmacology: Spotlights on progress and beacons to the future

October 22-23, 2021 - Virtual Congress

Symposium Proposal & Abstract Deadline: July 16, 2021

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Vancouver, Canada

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Oxford, UK

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Kyoto, Japan

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INSTITUTE of MENTAL HEALTH National Healthcare Group

PSS Pharmacological Society (Singapore)

NUS National University of Singapore | Department of Pharmacology Yong Loo Lin School of Medicine

NUS National University of Singapore | Department of Psychological Medicine Yong Loo Lin School of Medicine

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Singapore 117600.

https://ascnp2021.pharmconf.org/

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42ND ANNUAL CONFERENCE of the West African Society for Pharmacology (Zaria 2021)

(Both Face-to-Face and Virtual Participations)

26th - 30th October, 2021

THEME

Pharmacology and Pharmacologists in Developing Countries in the 2020s

VENUE: Faculty of Pharmaceutical Sciences Ahmadu Bello University Zaria Kaduna State Nigeria

SUB-THEMES

- Pharmacology, COVID-19 Pandemic and other Public Health Disasters
- The Role of Pharmacologists in Curbing the Menace of Drug Abuse and Addiction
- Toxins: Veritable Arsenals in Drug Development
- Clinical Trials of Herbal Medicines: Prospects and Challenges

Pre-conference Workshop

DROSOPHILA AND OTHER MODEL ORGANISMS IN BIOMEDICAL RESEARCH

25th-28th October, 2021

PANEL DISCUSSION (VIRTUAL)

INTEGRATING BASIC AND CLINICAL PHARMACOLOGY FOR ALL-ROUND DEVELOPMENT

26th October, 2021

Organised and Hosted by:

DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS
Faculty of Pharmaceutical Sciences
Ahmadu Bello University, Zaria, Nigeria

REGISTRATION

Early Bird: N25, 000.00 ($80) 30th June, 2021
Regular: N30, 000.00 ($100) 30th September, 2021
Late: N40, 000.00 ($110) After 30th September, 2021
Early Bird for Students: N15, 000.00 ($65)
Regular: N20, 000.00 ($75) (Certified)

ABSTRACT SUBMISSION

Preparation: Structured, 300 words max. In MS words, TNR 12pt Double line spacing
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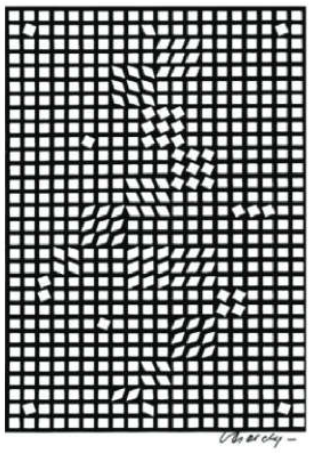
11TH ISCTICO-HUPHAR-IUPHAR 2021 CONFERENCE

October 27-30, 2021 – Pécs, Hungary

HUPHAR
Hungarian Society for Experimental and Clinical Pharmacology



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SZENTÁGOTHAI JÁNOS KUTATÓKÖZPONT

https://huphar.org/isctico2020/

Dear Colleagues,

We would like to inform you, that the 11th International Symposium on Cell/Tissue Injury and Cytoprotection /Organoprotection (ISCTICO), joint meeting of the Hungarian Society for Experimental and Clinical Pharmacology (HUPHAR) and IUPHAR GI Section is planned to organize between **27-30 October, 2021**, with the original scientific program.

The preparations of the symposium are in progress. The online registration system – with early bird registration fee and abstract submission option - has been reopened.

Deadline of abstract submission: September 5, 2021.
Deadline of early bird registration fee and payment: September 20, 2021.

For further information, please visit the conference website: https://huphar.org/isctico2021/

The Organizing Committee wishes you good health during this challenging period.

We look forward to seeing you in person in the autumn of 2021!

Prof. Dr. Zsuzsanna Helyes
HUPHAR Secretary General
Chair of the Symposium

Prof. Dr. Klára Gyires
President of the IUPHAR GI Section
Co-chair of the Symposium

Prof. Péter Ferdinandy
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NC-IUPHAR REMIT AND TERMS OF REFERENCE

Steve Alexander, Michael Spedding

The Nomenclature and Standards Committee of the International Union of Basic and Clinical Pharmacology (NC-IUPHAR) is a critical committee of IUPHAR, which was established in 1987 at the Xth International Congress of Pharmacology, by the president, Sir Colin Dollery, with the goal of issuing guidelines for the nomenclature and classification of receptors and ion channels. This has been extended to include all the targets of current/future prescription medicines. NC-IUPHAR has addressed many important questions, issues and controversies in pharmacology, and has overseen the development and expert-driven annotation of an authoritative and open access, global online resource, the IUPHAR/BPS Guide to PHARMACOLOGY database (GtoPdb, see below). Since its inception, NC-IUPHAR has had four Chairs (Table 1), who are proposed by NC-IUPHAR and validated by the Executive Committee of IUPHAR.

Table 1: Chairs of NC-IUPHAR

Term	Chair	Location
1989-1998	Paul Vanhoutte	Paris, France
1998-2002	Robert Ruffolo	Collegeville, Pennsylvania, USA
2002-2014	Michael Spedding	Paris, France
2015-Present	Stephen Alexander	Nottingham, UK

NC-IUPHAR has the objectives of:

1. Issuing guidelines for the nomenclature and classification of all the (human) biological targets, including all the targets of current and future prescription medicines;
2. Facilitating the interface between the discovery of new sequences from the Human Genome Project and the designation of the derived entities as functional biological targets and potential drug targets;
3. Designating polymorphisms and variants which are functionally important;
4. Developing an authoritative and freely available, global online resource, the IUPHAR database, accessible via the Guide to PHARMACOLOGY portal (https://www.guidetopharmacology.org), with a remit to:
   - provide access to data on all known biological targets;
   - enable students and scientists in academia and industry, working in areas related to pharmacology and drug/target research, to exploit the full potential of the considerable amount of information on drug action available in the published literature;
   - provide an entry point into the pharmacological literature for basic and clinical scientists from other disciplines;

- provide an integrated educational resource with access to high quality training in the principles of basic and clinical pharmacology and techniques;
- foster innovative drug discovery.

NC-IUPHAR holds one-day scientific meetings twice a year (which have been supported by unrestricted grants from Servier and previously the Wellcome Trust), which would normally take place in either Paris or Edinburgh, where there is high level discussion of developments across pharmacology and updates to the IUPHAR/BPS Guide to Pharmacology online database, GtoPdb. In general, these meetings have a focussed group of international attendees (typically 20-30) with an over-arching theme for two sessions on the day, combined with a more general 'current awareness' session. In November 2020, a focus for the scientific symposium was fibrosis and its pharmacological/therapeutic targetting. Due to the electronic format of the meeting, some of the talks have been made available for wider viewing - https://www.guidetopharmacology.org/fibrosisSymposium20.jsp.

There are three major outputs from NC-IUPHAR, which are co-ordinated by weekly meetings of the Chair with the curatorial team in Edinburgh, quarterly meetings of the NC-IUPHAR Executive group and the biannual meetings of NC-IUPHAR: discussions of target nomenclature and standards in Pharmacological Reviews; updates on pharmacological issues in the British Journal of Pharmacology and the Concise Guide to Pharmacology.

Pharmacological Reviews

From 1992 to date (mid-2021), 111 reviews have been published in Pharmacological Reviews, following an agreement with ASPET. These IUPHAR-badged reviews are free to access and have > 42 500 citations (Web of Science). There have been 'compendium' issues on voltage-gated ion channels (lead by Bill Catterall, 2003) and nuclear hormone receptors (lead by Vincent Laudet, 2006) which have revolutionised nomenclature in the respective fields, as did landmark reviews on chemokine receptors (lead by Phil Murphy), and of course, 5-HT receptors.

Other publications have more generalised applications. An early review in 1996 (IUPHAR 12) focussed on establishing guidelines for the nomenclature of new receptor subtypes (PM:8685244), which aimed to present logical unifying principles for receptor nomenclature and avoid the confusion observed when different groups applied personal preferences for names. Later, in 2003, IUPHAR 38 updated the terms and symbols in quantitative pharmacology (PM:14657418) and in 2014, IUPHAR 90 provided recommendations for the nomenclature of receptor allosterism (PM:25026896).

British Journal of Pharmacology

Since 2012, NC-IUPHAR has published 31 reviews in BJP, with over 1 700 citations, following an agreement with the British Pharmacological Society. The focus of reviews have been updates of the pharmacology of molecular targets with established nomenclature, or more diverse topics ranging from splice variants (IUPHAR 4, PM:24670145) to translational pharmacology (IUPHAR 6, PM:24428732) to immunopharmacology (IUPHAR 16, PM:26173913).

The Concise Guide to Pharmacology

The Concise Guide to Pharmacology is produced biennially as a special issue of the British Journal of Pharmacology. Currently, it is the only hard copy printed by BJP. Together with a precursor, the Guide to Receptors and Channels, nine editions (+ two online revisions) have been published. These have accumulated over 8 750 citations, with a mean rate of close to 2 000 citations/year. The Concise Guide is an abstract of the most clinically or pharmacologically significant parts of the online GtoPdb and is freely available to download, and as a collection of PDF files on USB memory devices for distribution to areas of the world with poor internet access.

GuidetoPharmacology.org (Twitter @GuidetoPHARM)

IUPHAR, particularly NC-IUPHAR, together with the British Pharmacological Society (BPS), have for many years run an open access online database (IUPHAR/BPS Guide to PHARMACOLOGY database; www.guidetopharmacology.org, GtoPdb) of pharmacological agents and their targets, together with more modest records on disease and cell types. GtoPdb is actively promulgated by the British, American, Japanese, Indian and Chinese Pharmacological societies. Google Analytics reports over 21,000 current users across the world (developed and developing) who between them access GtoPdb an average of 32,000 times per month.

GtoPdb provides access to expert-curated pharmacological, chemical, genetic, functional and pathophysiological data on all the known biological targets of approved and experimental drugs. The data in GtoPdb are largely derived from the primary literature, utilising an international network of 500+ researchers arranged into 90+ NC-IUPHAR subcommittees. This level of curation together with the considered, careful advice of the expert subcommittees ensure that it has a much higher quality, in terms of accuracy, than resources built by algorithmic data-mining by machines. The most recent release of the database in April 2021 included 2989 targets (approximately half of which are human proteins, but also include targets in the malaria parasites and SARS-CoV-2 virus). We have 10 894 ligands, with 18 437 curated binding constants and 40 516 references.

It also provides an integrated educational resource with access to high quality training in the principles of basic and clinical pharmacology and techniques. NC-IUPHAR has recently expanded the development of its online resources into the arena of immunopharmacology (see below), and has plans to further extend its interests into areas including natural product research and anti-infectives (see below).

In October 2016, we officially launched IUPHAR Guide to IMMUNOPHARMACOLOGY database project (GtoImmuPdb), developed to address the specific need for data exchange in the pharmacology of immunity, inflammation and infection research. This database is an immunity/inflammation-focused extension of GtoPdb, with an 'immunologist-friendly' web portal to access the data. A global pharmaceutical R&D review listed the top-three general mechanisms of action as immunostimulant, anticancer immunotherapy and immunosuppressant, covering 1704, 399 and 221 therapeutic agents, respectively (Pharmaprojects® pharma R&D annual review 2016). The increasing dominance of these

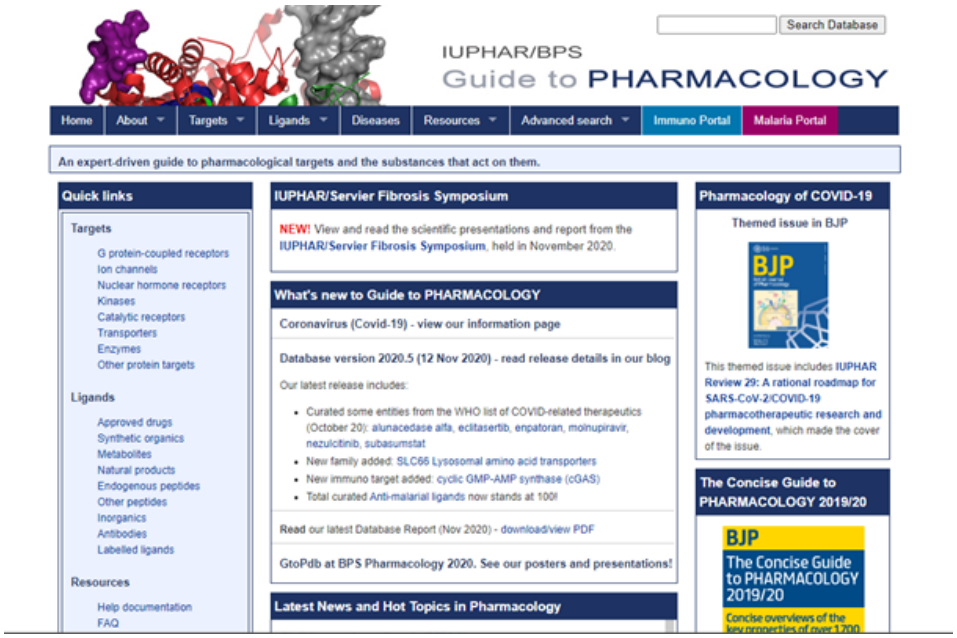
categories is reflected in growing academic and industrial research in the pharmacology of immunity, inflammation and infection. Data exchange between these three research communities and the pharmacology community is therefore critical to the development of new drugs. Hence our drive in this direction.

We have also recently been funded by the Medicines for Malaria Venture (MMV) to add information about antimalarials to our database (MMV Guide to MALARIA PHARMACOLOGY), along with a purpose-built parasitologist-friendly front-end (a tailored portal for the website interface). We are also in the process of applying for funding to build a new expert-curated database for the pharmacology of antimicrobials and antimicrobial resistance. Finally, we are planning to construct a novel bioinformatic platform, including state-of-the-art automated reasoning, to accelerate therapy development for rare diseases. The technology will add significant value to existing resources, and will also be relevant to common diseases showing phenotypic overlap with rare diseases.

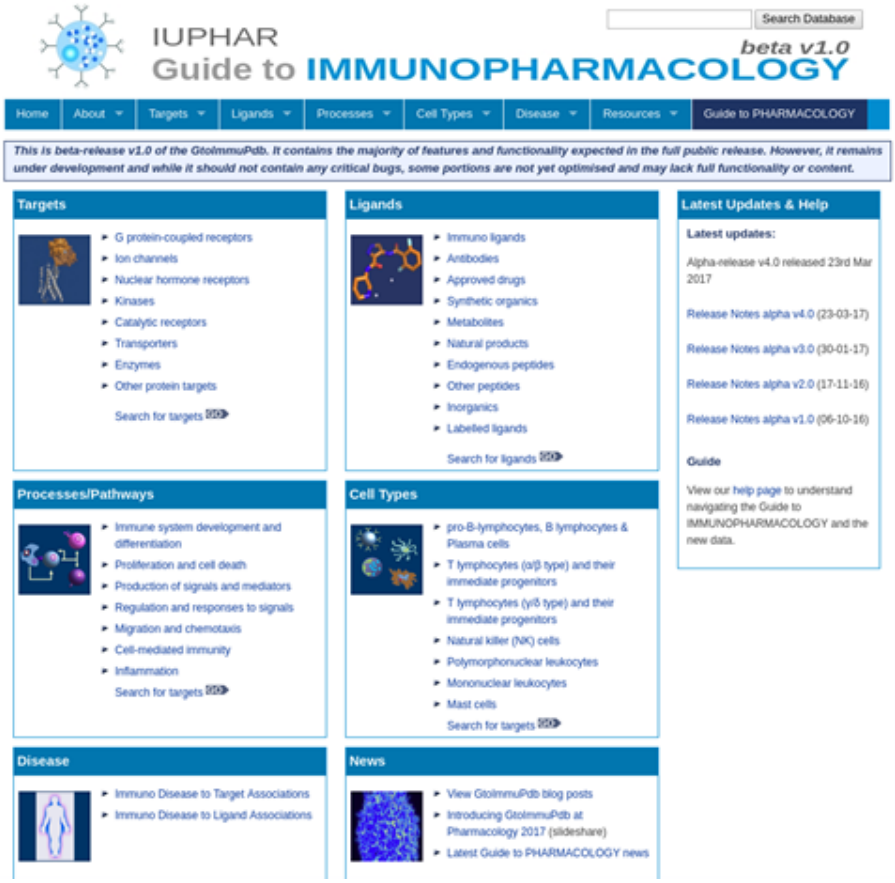
IUPHAR DATABASES

NC-IUPHAR has established the Guide to Pharmacology with major financial support from the British Pharmacological Society (BPS) and the Wellcome Trust. This freely available website was constructed with Pr Jamie Davies at the University of Edinburgh as PI, and covers all drug sites and receptor systems with a unique quality control of the NC-IUPHAR subcommittees regrouping ~700 scientists.

The British Journal of Pharmacology (BJP) publishes the Concise Guide to Pharmacology from this.



Chair NC-IUPHAR : Steve Alexander
Chair Edinburgh database group : Pr Jamie Davies
Curators: Simon Harding and Elena Faccenda



With financial support from the Wellcome Trust

Curator : Jane Armstrong, in close links (and sponsorship) with the Medicines for Malaria Venture.

The IUPHAR Pharmacology Education Project (PEP, curator Elena Faccenda) is a feel-available educational database, supported by IUPHAR. There will be a full report in the next issue.

Clare Guilding (Newcastle University) is now deputy director of PEP.
Past sponsors have been ASPET, CNPHARS, JPS, HSEC and the site was built at the University of Edinburgh.

2018-2022 EXECUTIVE COMMITTEE

The current Executive Committee of IUPHAR was elected by the Council at its General Assembly at the 18th World Congress of Basic and Clinical Pharmacology (WCP2018) in Kyoto, Japan. The Executive Committee serves a four-year term.

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MILESTONE ANNIVERSARIES

THE BRITISH PHARMACOLOGICAL SOCIETY CELEBRATES ITS 90TH ANNIVERSARY

As many of you will know, the British Pharmacological Society is a charity with a mission to promote and advance the whole spectrum of pharmacology. We are a friendly and collaborative global community, with members from more than 60 countries worldwide. We are also a proud member of IUPHAR.

This is a very special year for the Society, as 2021 marks 90 years since its foundation, and 75 years since the first edition of the British Journal of Pharmacology. This is an opportunity to celebrate our history and the impact that pharmacology has had on the world since 1931, and to look to the future of pharmacology and therapeutics in a rapidly-changing world.

We are currently preparing for our annual Pharmacology meeting, taking place from 7-9 September. We hope you will join us online for the chance to share science and socialise with hundreds of fellow scientists from across the pharmacology and therapeutics community.

Other recent highlights of our work:

- Opportunities to celebrate our members. In May, we announced our 2021 prize recipients, representing a range of specialisms in pharmacology and commemorating the people who make up our vibrant community. In June, several pharmacologists were recognised in the Queen's Birthday Honours for their outstanding contributions to the COVID-19 response.
- On 13 July we will be continuing our successful BPS Live webinar series with a free webinar, sponsored by the British Journal of Pharmacology (BJP), exploring the un-tapped resource of natural products in drug discovery.
- Our journals have continued to publish high quality and timely content, including multiple themed issues in the BJP and the British Journal of Clinical Pharmacology (BJCP). The BJCP has also recently launched an exciting opportunity to submit content for its 'clinical pharmacology at large' series, which explores the multifaceted interactions between clinical pharmacology and society. Our Open Access journal, Pharmacology Research & Perspectives, is also calling for content for its education and innovation series.
- In September, look out for the newly updated Concise Guide to PHARMACOLOGY – the essential guide for those working in the vital search for new drugs.

MILESTONE ANNIVERSARIES

ASCEPT CELEBRATES ITS 55th YEAR OF MEMBERSHIP WITH IUPHAR

Over this greater than fifty year period, the members of ASCEPT have continued to generate world class research, education and leadership in Departments of Pharmacology and Toxicology, Medical Schools, Schools of Pharmacy, and Research Institutes around the globe. The Society has a strong relationship with the pharmaceutical industry and government. With its membership providing numerous representations to State and Commonwealth Departments of Health, the Therapeutic Goods Administration, and National Prescribing Service. Many national and international boards and (government) working parties benefit from having ASCEPT members providing their expert input. This demonstrates that ASCEPT continues to be relevant to education, industry and government both nationally and globally.

ASCEPT is committed to inclusive participation for all its members and, as such, the Society launched the Equity, Diversity and Inclusion Policy in 2019. Among others, a number of strategies have also been implemented to encourage growth and support for student members and for those conducting pharmacological or toxicological research.

Alongside IUPHAR, ASCEPT have built strong relationships with other pharmacological societies including the BPS, BTS, JPS and APFP.

ASCEPT anticipate future and ongoing collaborative efforts with IUPHAR, and other key pharmacological societies. We also look forward to meeting at WCP in Glasgow in 2023 and subsequently hosting WCP in Melbourne in 2026.

MILESTONE ANNIVERSARIES

THE HONG KONG PHARMACOLOGY SOCIETY CELEBRATES 35 YEARS

Hong Kong Pharmacology Society (HKPS) has endured serval difficulties over the past few years and even missed its own AGM. This was partly due to the pandemic, but we believe our situation is improving and our birthday brings new wishes. We have had difficulty in attracting new members, given the loss of stand-alone pharmacology departments in Hong Kong, and have faced the loss of members due to natural retirement, and/or relocation to other countries. Perhaps our greatest loss was Professor Paul Vanhoutte, a previous President of HKPS, who passed away on 23 August, 2019. Professor Vanhoutte made outstanding contributions to pharmacology throughout his career. He chaired the IUPHAR Committee for Receptor Nomenclature from 1989 to 1998, was Secretary General of IUPHAR from 1998 to 2002 and President from 2002 to 2006.

Professor Paul Vanhoutte

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MILESTONE ANNIVERSARIES

THE MALAYSIAN PHARMACOLOGY SOCIETY CELEBRATES 15 YEARS

Since the establishment of Malaysian Society of Pharmacology and Physiology (MSPP) in 1974, our society is continually committed in conducting various activities tailored to the need of its members. The society is now led by Prof. Dr. Nafeeza Mohd Ismail as the President, and Assoc. Prof. Dr. Wan Amir Nizam Wan Ahmad as the Vice President. Currently, MSPP has 174 Ordinary members and 57 Lifetime members which comprises of senior and junior academicians, researchers, and students from various public and private higher institutions. This year, our 34th MSPP Scientific Meeting was jointly organized with Monash University, and the event will be held from 15 to 17 July 2021. Due to the COVID-19 pandemic, the meeting will be conducted using virtual platform for the first time. This year, we are delighted to receive an overwhelming number of local and international participants, totaling to 673. Besides the annual scientific meeting, we managed to organize two annual competitions to celebrate the early-career members in the society; the MSPP Young Teacher Award (YTA) and MSPP Young Investigator Award (YIA). For MSPP YTA Competition, eight early career members with two to five years of teaching experience have joined this competition. While for YIA awards, six investigators aged less than 40 years old submitted their applications, and three shortlisted candidates will be competing for the title, "MSPP Young Investigator Award" during the coming 34th Scientific Meeting. Despite the curb of the face-to-face programs, the society has now fully utilized the virtual platform for all of our society programs. One of the society's initiatives was by organizing online Global Lecture Series, a joint collaboration program with International Medical University. The first lecture was held on 20th April 2021 via Zoom, and the society was honored to have Prof. Dr. David S. Ludwig from Harvard Medical School to give a lecture on 'The Carbohydrate - Insulin Model of Obesity'. The session was moderated by our President, Prof. Dr. Nafeeza Mohd Ismail and was attended by more than 80 participants. The second Global Lecture Series is scheduled soon on 31st July 2021 with the title, 'Ketones: The Metabolic Advantage', to be delivered by Assoc. Prof. Dr. Benjamin Bikman, from Brigham Young University, Utah. The society now is geared for more interactive engagement with our members and public community using social media platforms. We currently have our official Facebook and Instagram pages. Few future programs are currently in plan such as the MSPP Refresher Course, a program which is aimed at refreshing knowledge in pharmacology and physiology topics. Apart of that, we also plan to have 'Meet-the-Member' series as a networking platform for the members of the society. Besides targeting our society members, we are also anticipating to have the community engagement project in near future with some local communities in Malaysia. We hope for many excellent years ahead for MSPP.

MALAYSIAN SOCIETY OF PHARMACOLOGY AND PHYSIOLOGY (MSPP)

OTHER MILESTONE ANNIVERSARIES

Canadian Society of Pharmacology and Therapeutics- 90 years (1931)

Norwegian Society of Pharmacology & Toxicology- 85 years (1936)

South African Society for Basic & Clinical Pharmacology- 55 years (1966)

West African Society for Pharmacology- 50 Years (1971)

Association of Pharmacologists of Ukraine- 20 Years (2001)

Late-Breaking news: despite UK cuts, David Lewis (IOSP) retains his education grants, for Africa, to give ethics and welfare courses (1 course already given in Uganda, with 100 participants, 5 more countries to follow)! Furthermore the All-Africa congress in September (page 25) and the West African congress in October (page 27) are open for abstracts and registration: registration is not expensive and open around the world for scientists interested in African pharmacology.

SAVE THE DATE!

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MEMBERSHIP:
The members of IUPHAR are national, international and special research interest societies. If you are an individual, please visit www.iuphar.org for additional information on the societies you are interest in joining.

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