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pulse@UM

SEARCHING FOR 'SILVER BULLETS' IN HEALTHCARE

- Development of imaging data repository of coronavirus disease 2019
- Neuroplasticity in rehabilitation
- From snake venomics to diagnostics and therapeutics
- Artificial intelligence in dermatology
- UM-NYCU research collaboration

A RESEARCH BULLETIN BY THE FACULTY OF MEDICINE, UNIVERSITI MALAYA

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MESSAGE FROM THE DEAN

Greetings, colleagues!

I hope this message finds you and your loved ones healthy and well.

It has been over a year since the pandemic swept the world, bringing life to a near standstill. As we move ahead together in the new normal, I am proud of your resilience and tenacity in the face of these great challenges. Following the active roll-out of COVID-19 vaccinations throughout the country, we hope to see a brighter future for both healthcare and societal well-being. As researchers, we also hope to be able to continue our research in an environment that is vibrant, rigorous, and engaging.

The global COVID-19 vaccination rollouts is one of the best healthcare research success stories of the year. The rapid development of the COVID-19 vaccine is the perfect culmination of strong cooperation between fundamental, translational, and clinical research – the theme of this issue, which I am happy to present. In this current issue, Pulse@UM highlights the brilliant work done by our faculty members in piecing together the ingredients for the 'silver bullet' in various health domains: COVID-19 biosensors; envenomation; artificial intelligence in dermatology; and stroke recovery. This issue also celebrates the achievement of our researchers, who have received various awards. Congratulations to all the recipients and thank you for your efforts.

Additionally, this issue features recent events that took place amidst the pandemic including an inaugural lecture by Prof Jamal I-Ching Sam; research mentoring groups; the Malaysian Implementation Science Training in HIV (MIST) summer bootcamp, and a community-based, vaccination program – all of which have made the faculty very proud.

Last but not least, it is with a heavy heart that I announce to you the retirement of Prof. Chirk Jenn Ng, who has been the Deputy Dean of Research for the past three years. Prof. CJ, as he is fondly called , has contributed immensely to the faculty research ecosystem, including overseeing Pulse@UM. He has successfully steered research in the faculty to greater heights through his many excellent initiative. Although he will be missed, I am sure that Prof. CJ will continue to shine wherever he journeys to next. Thank you, and good luck.

The impact of science on our society is immense. We are fortunate to have witnessed this, and be part of the scientific community. Thank you for your ongoing commitment to the Faculty's standard of excellence in research during this challenging time. Hopefully, we can start to prepare towards a safe return. In the meantime, I would encourage you to get your vaccines if you have not done so, and continue to advocate for vaccination.

I look forward to seeing you all in person soon.

Happy reading!
Dean

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DEVELOPMENT OF IMAGING DATA REPOSITORY OF CORONAVIRUS DISEASE 2019 (COVID-19) IN UNIVERSITI MALAYA MEDICAL CENTRE.

The current Coronavirus disease 2019 (COVID-19) pandemic has increased the burden on the healthcare system. COVID-19 commonly manifests as fever, cough and shortness of breath and varies in severity from asymptomatic to critical illness. Confirmatory diagnosis of COVID-19 is by real-time reverse transcription polymerase chain reaction (RT-PCR) of viral nucleic acid. Chest x-ray (CXR) and computer tomography (CT) of the chest are part of the investigations used in diagnosis and prognostication of COVID-19. Based on certain features, multiple severity scoring systems have been published to assess disease severity based on imaging to aid patient management. With the aim of developing deep learning algorithms to assist in diagnostic interpretation and disease monitoring, a data repository has been set up by the Department of Biomedical Imaging, Universiti Malaya Medical Centre (Figure 1).This data is preserved for future studies, education, support and design of future policies.

Deep learning tools on CXR and chest CT have shown positive results in detecting and differentiating COVID-19 from other lung pathologies. Deep learning tools objectively assess images compared to subjective visual assessments by the radiologist. Previous study found that among the prominent 10 convolutional neural networks (CNN) on diagnosis of COVID-19, the best performance which is comparable to the moderate performance of radiologists is set by ResNet-101 and Xception tools (1).

Our collaborators include eminent scientists, Professor Rajendra U Acharya from Ngee Ann Polytechnic, Singapore and Prof Chow Li Sze from UCSI University. Over 500 normal and COVID-19 pneumonia CXRs from this repository have been used alongside over 10000 public domain CXRs for the development of

deep learning systems to improve confidence in diagnosing COVID-19 changes on CXR (Figure 2 and 3). To date multiple works are underway, focusing on automated identification of COVID-19 pneumonia using deep learning algorithms (2).

The application of deep learning curated from a data repository in the current COVID-19 clinical setting is crucial for accurate, fast diagnosis and prognostication of the disease.

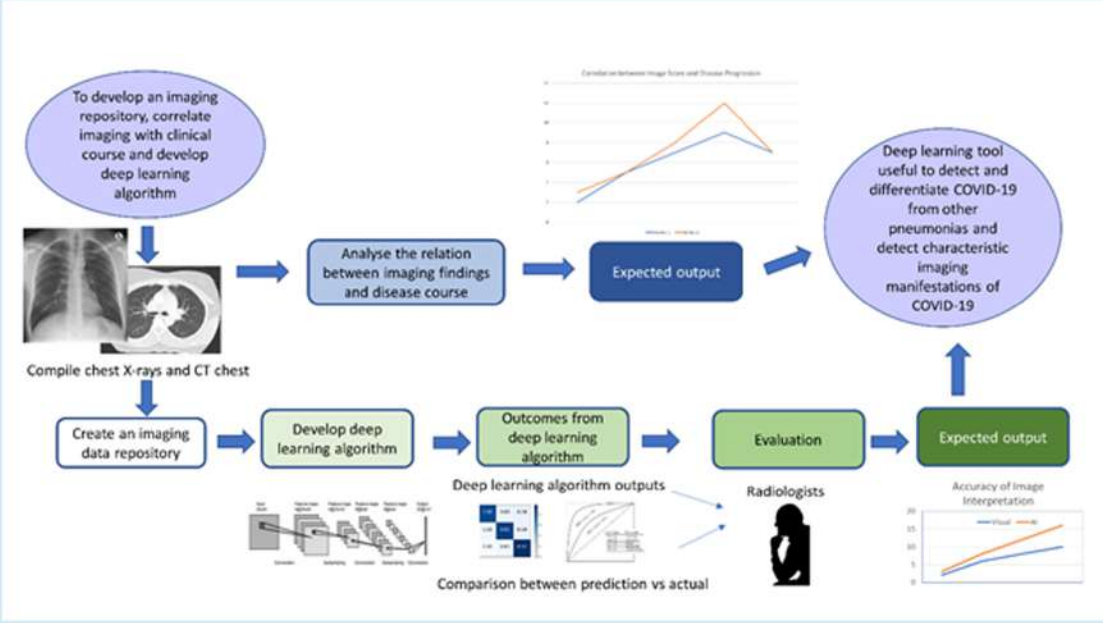

Figure 1: Workflow of developing an imaging data repository of CXR and CT chest in COVID-19.

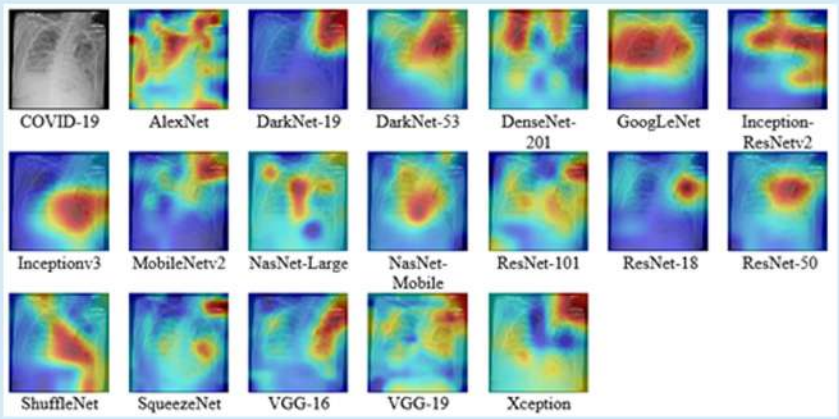

Figure 2: Heatmap for visual understanding of CNN interpretation of CXR with pneumonic changes.

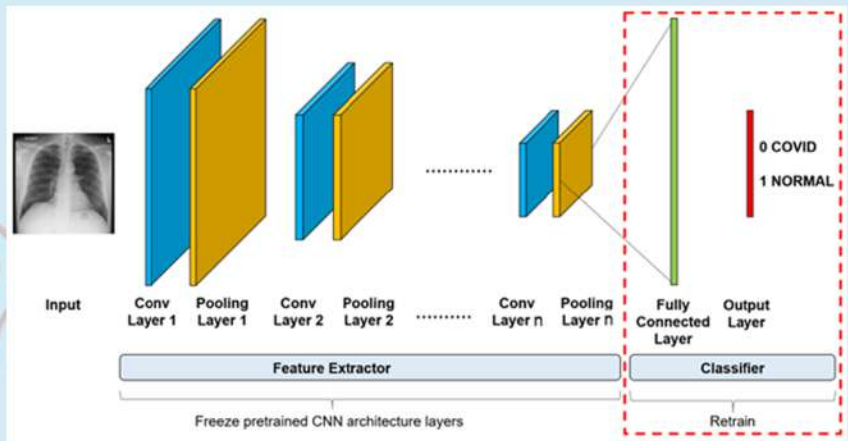

Figure 3: An overview of convolutional neural network architecture process of interpreting images.

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NEUROPLASTICITY IN REHABILITATION : ROADMAP TO FUNCTIONAL RECOVERY AFTER STROKE.

We used to learn that our brain cells stopped dividing with age and that our brains are thus static, hence there will be limited chances of recovery after any injury to our adult brains. However, this is no longer true. The concept of neuroplasticity is now often quoted in neuroscience and neurorehabilitation.

In simple terms, neuroplasticity can be described as the brain's neural network's ability to change, reorganise and adapt to changes such as through experience, stimulation or pathology.

In rehabilitation medicine, this concept is used to encourage recovery from stroke or brain injuries, via the concept of specific practice, high repetition and intensity. For example, a patient with adequate motor recovery is prescribed with robotic exoskeletons to deliver the high number of steps/minute repetition to enhance neuroplasticity. When coupled with an enriched environment of adequate stimulation and novelty, with achievable but challenging tasks, such rehabilitation programme can facilitate further synaptic re-connections.

This concept allows incorporation of virtual reality, interaction and gamification into rehabilitation as well. In addition to the behavioural approaches, direct neural stimulation with non-invasive brain stimulation (neuromodulation) is also being investigated to facilitate neuroplasticity. As our neurons function via an electrical gradient across the cell membrane, the use of an external physical agent can influence the brain's cellular function.

An example is the Transcranial Magnetic Stimulation (TMS) procedure which induces an electrical counter current in the cortical neurons below the coil when applied on the cranium. At submaximal power, a repetitive TMS (rTMS) can stimulate or inhibit those neurons. Therefore, rTMS can prime the brain neural network to adapt and relearn and further augment the effects of behavioral rehabilitation therapy.

Reha Technology's G-EO systems, a body weight suspended, end effector walking system utilised in the Physiotherapy gym, 11th floor, Menara Selatan.

Fourier M2 Motus, upper limb robotic rehabilitation platform incorporating gamification. Occupational therapy, 10th floor Menara Selatan.

Repetitive Transcranial Magnetic Stimulation (rTMS) inhibitive stimulation on the contralesional hemisphere in a stroke patient. This is to prime the brain to be more responsive to the subsequent rehabilitation therapies. Specialist Rehabilitation Clinic, 1st floor Menara Selatan.

Another neuromodulatory approach is by applying a small constant electrical current (2 miliAmp) via two sponge electrodes on the skull. This is termed Transcranial Direct Current Stimulation (tDCS). In this stimulation, the cortical neurons under the anode electrode are excited whilst that under the cathode is inhibited. Combined with behavioural therapy, this procedure may enhance learning. We have found that both 5-Hz rTMS and anodal tDCS induced effects on corticospinal excitability in persons with chronic stroke lasting at least 1 hour after stimulation (1).

Our latest research project is to investigate the role of TMS to obtain the lower limb motor evoked potentials, which can potentially guide the neurorehabilitation of gait impairment after stroke. This project is funded by a Fundamental Research Grant Scheme grant with co-researchers from the Faculty of Engineering (2).

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2. Mapping the corticomotor pathway of different lower limbs musculature from deep penetration transcranial magnetic stimulation responses. FRGS (FP002-2020)

For more on translating neuroscience, technology or neuromodulation into clinical practice, do get in touch with us at kj_rhm@ummc.edu.my

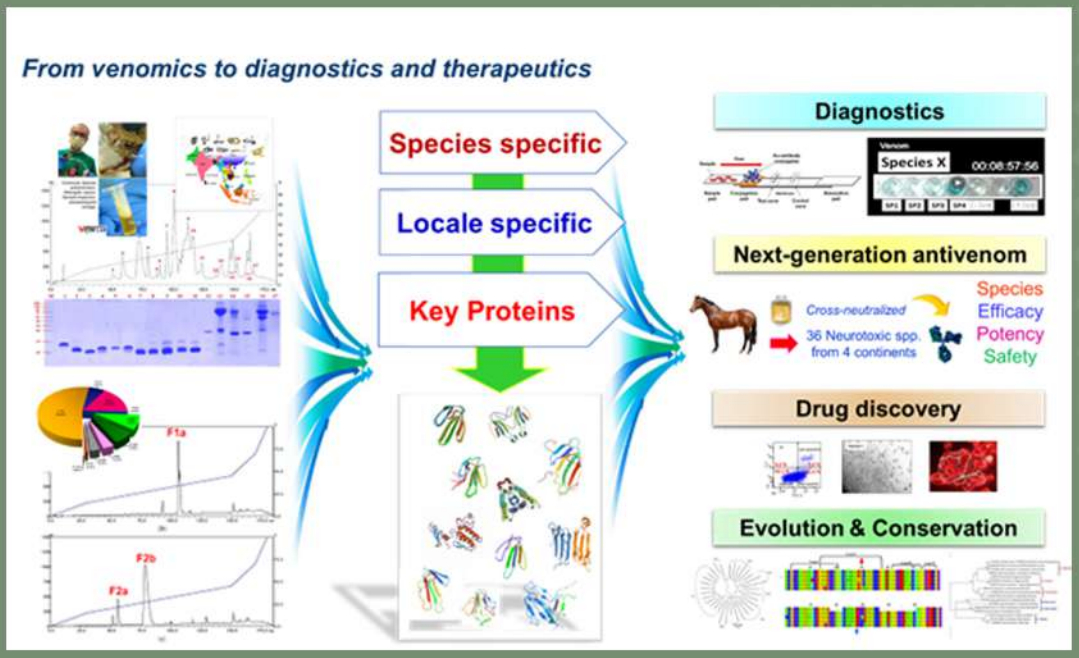
FROM SNAKE VENOMICS TO DIAGNOSTICS & THERAPEUTICS : A WINDING ROAD WITH MANY EXITS.

It is not easy to work on a "neglected" field when one is constantly reminded of and worried about having little research attention, and consequently, limited funds. Snakebite envenomation is one such example, despite it being at the top of the WHO's list of priority neglected tropical diseases. Each year, more than 100,000 people of the world's most impoverished populations are killed by snakebite envenomation. Unfortunately, safe and effective treatments are still lacking in many regions. Venomous snakes are highly diverse, and their venom compositions can vary extensively between and even within species, thus complicating diagnosis and compromising the effectiveness of antivenom.

Research into this area is urgently needed: yet, it is not uncommon to come across questions like "What can one achieve by researching snake venom? Why don't you do X (any hot topic that you can think of) instead for better support and returns?". Researching on snakebite envenomation is not merely an academic passion for the research team from the Vetox Lab, Department of Pharmacology but it is also about the team's undivided commitment to address the relatively unattended issues of snakebite envenomation worldwide.

The team perseveres, and works from basics to translation revolving around the solution to snakebite envenomation. For years, the team has sought to unravel the diversity and complexity of snake venoms through an optimised, integrated approach : a protein-decomplexation venomic strategy incorporating proteomics, transcriptomics and genomics, followed by pharmacological and immunological methods to elucidate the ensuing functional variances.

Applying high performance liquid chromatography, nano-LC-tandem mass spectrometry (LCMS/MS) and deep data mining, more than fifty snake venoms from various species and localities have been investigated to unmask the conservation and variation in snake venom phenotypes, as characterised by the expressions, compositions, structures and functions of various key toxins unique to individual species. The findings contribute to a better understanding of the pathophysiology of snakebite envenomation, and elucidate the shortcomings of existing antivenoms in snakebite therapy. For instance, in the series of Asiatic and African cobra *(Naja)* studies, the alpha-neurotoxins were shown to be the



the causative lethal components, accompanied with a phenotypic dichotomy of proteoforms with distinct antivenomic characteristics that underlie the variable neutralisation efficacy of various antivenoms. Accordingly, the neutralisation potency of antivenom largely remains low against all cobras, thus necessitating high doses in clinical treatment which will inevitably increase the risk of hypersensitivity reactions, treatment cost, and exhaustion of antivenom supplies.

Further studies with venoms from kraits *(Bungarus)*, king cobra *(Ophiophagus)*, sea snakes *(Hydrophis)*, sea kraits *(Laticauda)* and coral snakes *(Calliophis)* unveiled even wider interspecies and intraspecies variations in the compositions, pharmacological activities and neutralisation profiles of the neurotoxic venoms. The overwhelming variation is not without exceptions in the hemotoxic viper and pit viper venoms. From functional venomics, the team ventures further into applications for diagnostics and therapeutics. The key venom molecules are now used to develop diagnostic assays tailored to the individual species and biogeographical distribution.

The vast bioactive venom molecules in the team's venomic collection also serves as an untapped reservoir for drug discovery, and in this context, candidates with anticoagulant and anti-neoplastic properties have been identified and characterised. Besides, novel immunogen mixtures are formulated from the key toxins identified, and together with improved immunisation strategies, the team is currently leading a project in the development of a next-generation antivenom prototype to address the unmet global needs for effective antivenom treatment. The results are promising, revealing a broader spectrum of species coverage, wider geographical utility and higher efficacy of potentially universal antivenom for clinical applications. It is envisaged that the outcome will contribute towards WHO's vision to halve the global disease burden of snakebite by 2030.■

More information about Vetox Lab research can be found at www.vetoxlab.com or through email to principal investigator at tanch@um.edu.my.

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ARTIFICIAL INTELLIGENCE IN DERMATOLOGY

the rise of the machine

The widespread availability of big data combined with modern computing power has fueled a surge of interest in the use of artificial intelligence (AI). Deep learning is an application of AI that comprises multiple processing layers that can develop data representation with different levels of abstraction. These processing layers or neural networks have an input layer that accepts independent variables or inputs, one or more hidden layers, and an output layer that generates predictions.

Deep learning simulates the structure and function of the human brain to complete tasks such as object classification and detection, speech recognition, and recommendation systems.

Dermatology is a primarily visual speciality that lends itself well in terms of the potential application of deep learning for the classification of images. Different types of images that can be used include clinical photographs, dermoscopic images and histopathology images. The development of datasets such as the International Skin Imaging Collaboration (ISIC), which comprises 25,331 dermoscopic images, further improve the learning of the deep model.

The majority of the AI application work in dermatology explores the classification of skin cancer including melanoma and non-melanoma skin cancers such as basal cell carcinoma and squamous cell carcinoma. Other work involving AI application includes the classification of erythematous-squamous diseases (psoriasis, seborrheic dermatitis, lichen planus, pityriasis rubra pilaris, pityriasis rosea and contact dermatitis), onychomycosis, acne, assessment of leg ulcers, and alopecia.

The first step in image classification is image dataset preparation which includes image acquisition and image enhancement. The most common image data sources are photography and dermoscopy. The images may also be acquired from confocal scanning laser microscopy, ultrasonography, magnetic resonance imaging, optical coherence tomography, and multispectral imaging. Subsequently, the images may be enhanced to improve the information content of the original images.

Image segmentation is then performed to obtain the region of interest of the image that has specific properties such as luminance, colour and texture. For limited data sources, image data augmentation can be performed either with horizontal and vertical flipping. Alternatively, rotation with different angles can be carried out to increase the amount of images data and to prevent overfitting. The next step in image classification is feature extraction. In deep learning, feature extraction takes place in the neural network itself. The convolutional neural network (CNN) model is developed and trained using big datasets through algorithms.

Besides deep learning, some image processing methods, such as pattern analysis, ABCD rule, Menzies method, seven-point checklist, CASH algorithm (colour, architecture, symmetry, homogeneity) and discrete wavelet transforms, can be used in feature extraction. The feature classes include shape, colour, texture and high-level features (granularity, blue-white veil, blue-grey dots, circular-coloured spots, dark and white areas). After feature extraction, the feature map extracted is input to a classifier for classification. The classifiers include support vector machine (SVM), logistic regression, decision tree, random forest (multiple random decision trees) and Adaptive Boosting (AdaBoost).

The deep learning CNN approaches demonstrated better performance than image processing methods for the classification of skin cancer images. Deep learning achieved the highest classification accuracies of 90.3% for melanoma versus non-melanoma and 89.2% for skin cancer versus benign lesions. These results demonstrate the potential value of technology to aid diagnosis of skin lesions in the clinical setting, particularly for skin cancers.

Validation of the deep learning approaches with clinical data and the integration of these methods into user-friendly apps or software will be invaluable in terms of bringing the benefits of this type of research from the computer lab to real world applications.

Despite promising results demonstrated by deep learning and the commercialisation of skin cancer apps, some limitations still preclude widespread adoption. The results of the 2020 American Academy of Dermatology Augmented Intelligence Survey demonstrated mixed feelings among American dermatologists about the impact of AI.

Almost half of the survey respondents reported either negative or uncertain responses. Most of the misgivings were due to concerns about being replaced by AI. Due to the black-box approach of algorithms, there are difficulties posed in terms of clinical governance. Moreover, public acceptance may be limited as the human touch is still prized. More importantly, the amount and quality of data available greatly influence the results of AI. Metadata such as history and other clinical information are often unaccounted for.

Unbalanced datasets, inter-class similarities, intra-class dissimilarities, quality of real-life images, representation of minority populations and rare conditions pose problems in terms of training the AI algorithms. Therefore, these issues need to be addressed before AI can become part of mainstream clinical practice.■

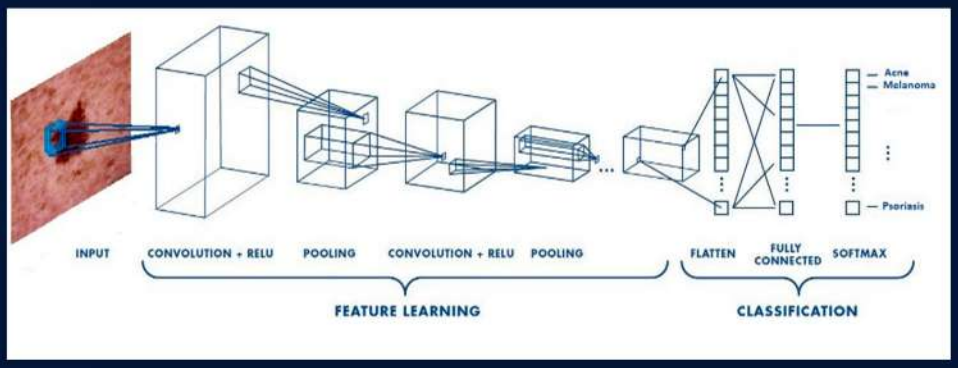

Figure 1: Convolutional neural network (CNN)

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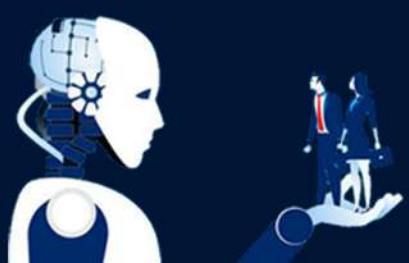

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UM-NYCU

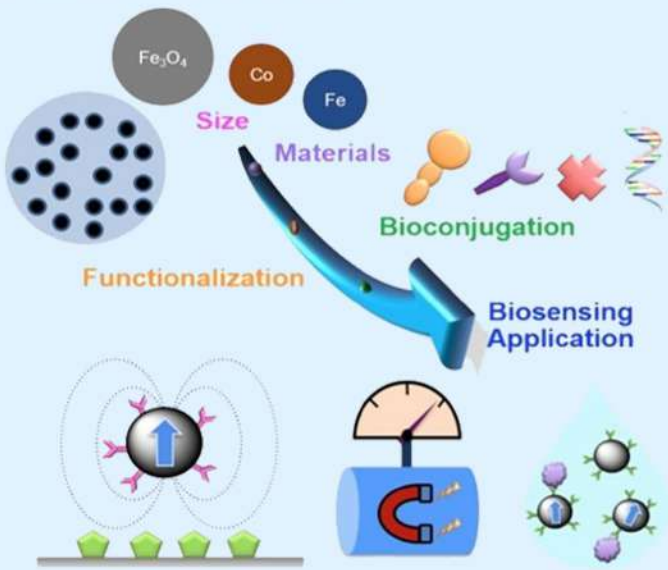
Research collaboration develops biosensing platform for the rapid screening of SARS-CoV-2 cell entry inhibitors

SARS-CoV-2 infect cells through binding its Spike (S)-protein to the cell surface angiotensin-converting enzyme 2 (ACE2) (1,2). Hence, inhibition of S-protein with ACE2 binding may block SARS-CoV-2's cell entry and reduce infection risks/progression.

Recently, the rapid screening of S-protein-ACE2 binding inhibitors was jointly attempted by the researchers from the Universiti Malaya (UM), Malaysia, in collaboration with the researchers from the National Yang Ming Chiao Tong University (NYCU) Taiwan (Figure 1). The rapid drug screening was performed via a biosensing platform consisting of an ACE2-coated palladium-nano-thin-film electrode (ACE2-Pd-NTFe) as the core sensing element, and S-protein as the binding ligand (Figure 2) (3). The platform detects the presence of electrochemical signals generated by the binding of S-protein onto the ACE2-Pd-NTFe, and subsequently compares the changes to those signals in the presence of the inhibitors. The platform was capable of detecting S-protein-ACE2 binding inhibition at low inhibitor concentration and small reaction volume within just 21 minutes. This is advantageous for the rapid screening of the approved drugs to repurpose them against COVID-19 (4).

A few potential S-protein-ACE2 binding inhibitors have been identified via the biosensing platform. This includes the active metabolites of the angiotensin converting enzyme inhibitors (ACEi) ramiprilat and perindoprilat, which respectively suppressed the S-protein-ACE2 binding by 72% and 67% : and SARS-CoV-2 in vitro infectivity by 36.4% and 20.1% compared to control (3). These drugs have the potential to be developed as adjunctive agents for the treatment of SARS-CoV-2 infection.

Unexpectedly, a few positive modulators of the S-protein-ACE2 binding were also identified. This includes enalaprilat and lisinopril that respectively enhanced the S-protein-ACE2 binding by 174% and 67%, and SARS-CoV-2 infectivity by 44.4% and 54.2% compared to control.



This may suggest an elevated risk of SARS-CoV-2 infection in patients who are prescribed with these medications for the management of cardiovascular diseases and hypertension (5). Nevertheless, as the abovementioned inhibition/enhancement phenomena were observed at molecular and in vitro level, their in vivo and clinical significance remained inconclusive and are to be further investigated.

Link to full article:
https://www.sciencedirect.com/science/article/pii/S0956566321002505

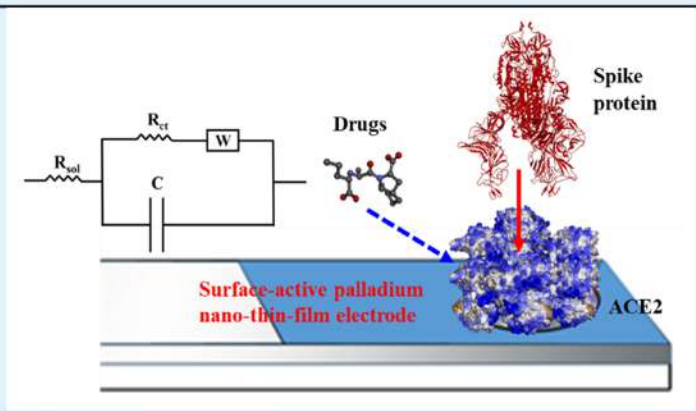


Fig 1: The EIS-based biosensing platform with ACE2-Pd-NTF electrode as biosensing probe against SARS-CoV-2's S-protein.

Fig 2 : Researchers from the Universiti Malaya and National Yang Ming Chiao Tung University take part in a news conference via videoconference, as they released the results of their joint study on a COVID-19 medicine selection platform.

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Learning from OUTBREAKS

On 12th April 2021, Professor Dr. Jamal I-Ching Sam presented his inaugural lecture titled "Learning from Outbreaks" online, which was chaired by Professor Dr. April Camilla Roslani, the Dean of the Faculty of Medicine. The MC was Harvinder Kaur, senior medical laboratory technologist from UMMC.

Prof Sam shared his journey in emerging infectious diseases (EIDs) following graduation from the University of Nottingham Medical School, United Kingdom in 1995, subsequent employment in the medical field (including infectious diseases) and specialist training in medical microbiology. In 2004, he joined the Department of Medical Microbiology, which was headed by Professor Dr. Hamimah Hassan. He greatly valued the various experiences as a clinical microbiologist, a researcher, and a teacher in Universiti Malaya. With the support of many excellent people around, he has been Head of the Virology Unit in UMMC for most of his career. This has coincided with a run of emerging RNA viral infections causing global and/or local outbreaks, including chikungunya virus (2008), pandemic influenza H1N1 (2009), Middle East respiratory syndrome coronavirus (2013), Ebola (2015), Zika (2015) and the latest pandemic of SARS-CoV-2 (2019-present). Each virus has posed diagnostic and biosafety challenges, and he has worked closely with UMMC multidisciplinary outbreak committees in developing protocols for the hospital.

Prof Sam spent his sabbaticals gaining knowledge in influenza and molecular diagnostics at excellent reference centres in PathWest, Perth and the WHO Collaborating Centre for Reference and Research on Influenza, Melbourne, Australia. He has helped to considerably expand molecular testing in the diagnostic laboratory in UMMC and introduced numerous molecular tests, including for influenza, influenza subtyping, MERS-CoV, Zika virus, HIV genotyping, 16S rRNA sequencing, Brucella, and others.

The improvements and preparation over the years for EIDs paved the way for the diagnostic laboratory to meet their biggest challenge, which ~ was providing molecular diagnostics for UMMC during the COVID-19 pandemic. At its peak, the laboratory carried out 700 tests/day, including helping the Ministry of Health with their testing burden, and completed over 30,000 tests in 2020 alone.T

Today, Prof Sam remains passionate and dedicated to EIDs research, as it satisfies his enjoyment for creativity, writing, scientific curiousity and visiting interesting places. He acknowledged his research collaborators, including Associate Professor Chan Yoke Fun with whom he shares a laboratory, and the post-docs and students who have enriched his research experience.

Towards the end of his 45 minutes talk, he gave a few thoughts on research and highlighted several expectations, which he hoped the UM community could continue to hold and build on in the future. He ended the talk by paying tribute to the hard work and dedication of people behind the scenes as well as his family, without whom his achievements would not have been possible. ■

Prof Sam's inspiring online lecture is available on YouTube at: https://www.youtube.com/watch?v=6b2bU42wHeg.

UM AND YALE COLLABORATION

MALAYSIAN IMPLEMENTATION SCIENCE TRAINING PROGRAMME (MIST)

Implementation Science (IS) is defined as the scientific study of methods to promote the systematic update of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services and care.

Building on over 15 years of successful collaboration and partnership with Yale University School of Medicine and School of Public Health, the Faculty of Medicine (FoM) at the Universiti Malaya (UM) is committed to gain expertise in IS. The goal is to develop and institutionalise the Malaysian Implementation Science Training in HIV (MIST) programme at UM – the first training on HIV and IS that incorporates human rights training in Malaysia. The two MIST co-directors Prof Dato' Dr Adeeba Kamarulzaman and Prof Frederick Altice have had longstanding collaboration since 2005. The MIST programme aims to provide advanced training and capacity building to four UM faculty members for them to be the "HIV Implementation Research Faculty" (HIRF: faculty track).

The MIST programme will provide advanced training and mentorship in IS, including individualised faculty-level training, development, and engagement. This programme will differ from the current PhD programme as the scholars will receive additional distance-based learning combined with one semester learning experience at Yale University, which will provide supplemental certificate training in implementation science.

The MIST programme completed its year one activities with certificate training provided to two FoM faculty members, Dr Rafdzah Ahmad Zaki and Dr Rumana Saif and two PhD students, Mona Sheikh Mahmud and Joselyn Pang.

The one-year MIST programme consisted of an intense in-depth introductory course on IS in the first semester, and a practical one-to-one coaching with IS experts on the MIST scholars' proposal development in the second semester. Additionally, the MIST scholars had the opportunity to select elective courses to enhance their research skills and knowledge throughout the two semesters. Science Training in HIV (MIST) programme at UM – the first training on HIV and IS that incorporates human rights training in Malaysia.

The MIST programme also has successfully conducted its first summer boot camp titled 'Summer Boot Camp: Real-life Implementation Science' which was held virtually on the 3rd-5th August 2021.

The summer boot camp welcomed more than 180 participants throughout Malaysia and the region. Besides keynote lectures, the participants had the opportunity to be involved in interactive discussions with IS experts and listened to case studies focusing on key population groups vulnerable to HIV. Implementation science is a relatively new discipline in Malaysia.

As such, the MIST programme is at the beginning stage of working with other Fogarty programmes to bring together hybrid training opportunities in Malaysia and across the several SE Asian training programmes. The MIST programme will be a great platform for learning and developing more local and regional researchers in this field.

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Mentoring with research group meetings - connecting, growing and learning together

The Medical Physics Research Group Meeting was formed in 2014 by Prof Ng Kwan Hoong and Dr. Jeannie Wong to bring postgraduate students together for weekly updates of research progress and as a support network for postgraduate research students. It started with five PhD students – MJ Safari, Susie Lau, Fione Tan, Jong Wei Loong and Nurul Hashikin. The meetings typically consist of students' presentations, research progress updates, and sharing of the research problems faced (Figure 1).

Figure 1: Physical meeting before the COVID-19 pandemic.

Figure 2: During the COVID-19 pandemic, the research meetings were switched to online.

Some clinical lecturers also participated in the meetings regularly, providing alternative perspectives and insights to the weekly discussions. Amid the COVID-19 pandemic, the meetings shifted from physical to virtual mode. This change opens up the possibility of inviting speakers from both within and outside Universiti Malaya (Figure 2). The weekly 30 minutes talks could be categorised into three main interests: 1) exposing the members to researches outside of their own fields, 2) providing the know-how of being a researcher and 3) organising motivational talks.

In one of the meetings, Dr. Heo Chong Chin, a forensic entomology expert, shared about penguin decomposition in the Antartica, Dr. Patricia Nora Anak Riget discussed sociolinguistics research and Dr. Woon Lai Kuan spoke about "In Silico Modelling of Interosseous Membrane Behaviour in 3D Forearm Rotation". In addition, clinical experts were also invited, such as Prof Dr. Saw Aik explaining the mechanics of fixing broken bones and Dr. Chan Yoke Fun sharing the latest updates on SARS-CoV2 variants in Malaysia.

Group members were also exposed to the importance of research ethics and integrity (Dr. Demin Chau), ethical data sharing (Dr. Sharon Kaur) and qualitative research methods (Dr. Lee Yew Kong). Singapore Medical Journal editor Prof. Wilfred Peh gave an editor's perspective on manuscript submissions, and Prof Ng Chirk Jen shared on the faculty's research direction and initiatives. In addressing the mental health and motivation of the students, Dr. David Yoong was invited to speak about "The power of failure". The group members were encouraged to be creative and cultivate the spirit of 'dare to explore the uncertainty'.

The students benefited by being included in a larger research community and therefore, they do not feel isolated in their master/PhD journey. As the number of students increases, spacing out from the first year to the final year, the new model encouraged broad knowledge and information exchange. The group automatically created peer guidance and support, like a scaffolding structure that guides students' study progression. They were constantly in touch with their peers and knew that they were not alone in this journey. They were aware of their peers and lecturers' different research skills and strength and often sought out each other for technical assistance. The research meetings were also utilised for students' mock proposal presentations, candidature defence and viva voce, providing a safe ground to practice and prepare for the actual presentations.

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Check out the youtube video on the group. https://cutt.ly/rEYH1ym

AWARDS & ACHIEVEMENTS

1 Best Neuroscience Publication Awards

Malaysian Society of Neurosciences
Persatuan Neurosains Malaysia

Best Clinical Neuroscience Paper

Association of dengue infection and Guillain-Barré syndrome in Malaysia.

Cheng Yin Tan, Siti Nur Omaira Razali, Khean Jin Goh, I-Ching Sam & Nortina Shahrizaila

Best Basic Neuroscience Paper

Electrostatic interactions at the five-fold axis alter heparin-binding phenotype and drive enterovirus A71 virulence in mice.

Han Kang Tee, Chee Wah Tan, Thinesshwary Yogarajah, Michelle Hui Pheng Lee, Hann Juang Chai, Nur Aziah Hanapi, Siti R. Yusof, Kien Chai Ong, Vannajan, Sanghiran Lee, I-Ching Sam & Yoke Fun Chan

2 Silver Award & International Award of Merit

MTE 2021™ Malaysia Technology Expo
The International Expo on Innovation and Technology

Coronary Heart Disease (CHD) Prescribed Self-care

The Malaysia-Croatia Technology Exchange 2021

Rasheeda binti Mohd Zamin, Ahmad Syadi bin Mahmood Zuhdi, Rabiah Adawiah binti Abu Seman, Azmin Azliza binti Aziz, Md Azalanshah bin Md Syed & Rashdaleena Athiefa binti Abdul Rashid

3 Silver Award at the International University Carnival on E-Learning (IUCEL) 2021

IUCEL 2021
INTERNATIONAL UNIVERSITY CARNIVAL ON E-LEARNING

Development And Evaluation Of A User-Centered Open Access Elearning Resource

The Literature Search Reusable Learning Object (RLO)

Chin Hai Teo, Chirk Jenn Ng, Hooi Min Lim, Ping Yein Lee, Yew Kong Lee, Kuhan Krishnan, Zahiruddin Fitri Abu Hassan, Ira Adila Binti Mohamed Yasin, Su May Liew & Ranita Hisham Shunmugam

4 Young Investigator Award

MALAYSIAN SOCIETY OF PHARMACOLOGY AND PHYSIOLOGY (MSPP)

Malaysian Society of Pharmacology & Physiology (MSPP) 34th Scientific Meeting 2021

Tan Choo Hock (Department of Pharmacology)

5 Academy of Sciences Malaysia (ASM) Fellowship

AKADEMI SAINS MALAYSIA

Fong Mun Yik (Department of Parasitology), Lau Yee Ling (Department of Parasitology) & Maznah Dahlui (Department of Social and Preventive Medicine)

6 President of the International Primary Care Respiratory Group

International Primary Care Respiratory Group
IPCRG
Est. 2001

Khoo Ee Ming (Department of Primary Care Medicine)

7 Council Member of Asian-Pacific Hepato-Panceato-Billiary Association (A-PHPBA) and President of the Malaysian Society of Hepato-Pancreato-Billiary (MyHPBS)

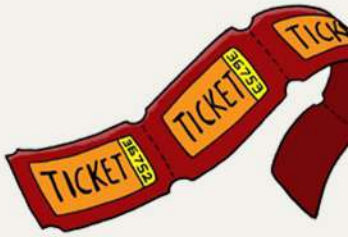
A-PHPBA

MyHPBS

Yoong Boon Koon (Department of Surgery)

A BRIEF OF

UPCOMING EVENTS



OCTOBER

07
Science cafe

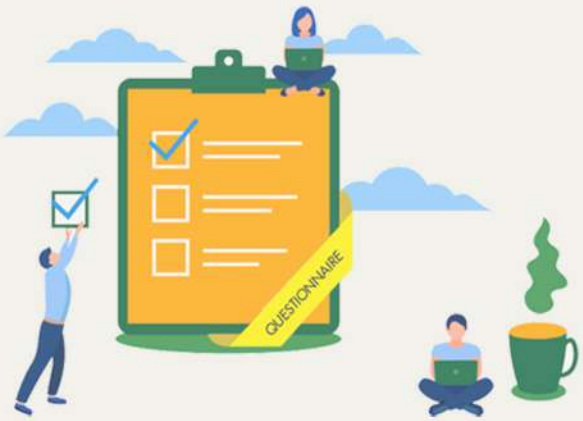
13 - 14
Sample size workshop

25 - 28
FOM Research e-carnival

NOVEMBER

09 - 10
Managing reference using endnote

16
Questionnaires validation



DECEMBER

16
Understanding statistical results in clinical research

thank you

TRIBUTE TO

PROF NG CHIRK JENN

FORMER DEPUTY DEAN OF RESEARCH, FOM

COLLABORATION IS THE KEY TOWARDS SCALING UP VACCINATION EFFORTS FOR THE VULNERABLE GROUPS

Misinformation regarding COVID-19 vaccination can occur within the community which includes Orang Asli. As highlighted by the World Health Organisation (WHO), vaccination and other public health initiatives are crucial and among the effective strategies to protect oneself and reduce the infection rates.

Common misinformation about the vaccine is related to the side effects of the vaccine which creates fear of health-deteriorating complications in people. It appears that the Orang Asli groups are not spared from the misinformation, and this may delay the community from reaching herd immunity if these vulnerable groups are left out from the vaccination programme. In addition, the lack of accessibility to the right information about the vaccine and the vaccine itself in certain areas requires attention by every stakeholder including the health authorities.

It is interesting to see that due to the efforts of the numerous agencies to combat the misinformation about the vaccine, the public including the Orang Asli are more aware of its importance and are more willing to be vaccinated.

Recently, healthcare personnel from the Hospital Orang Asli Gombak in collaboration with the Universiti Malaya Medical Centre (UMMC) staff had participated in an Outreach Programme in Perkampungan Orang Asli Desa Tamuan. This programme is supported by the Mass Rapid Transportation Corporation Sdn Bhd (MRT) where two buses were provided to be used as vaccination sites. About 508 vaccinees, which includes the Orang Asli, non-Orang Asli and non-citizens from the targeted location were successfully vaccinated.

This approach indirectly will scale up the National COVID-19 Immunisation Programme, allowing more people from the vulnerable groups in selected areas to receive their vaccines promptly and accordingly. In addition, the teamwork shown and continuous efforts by the stakeholders in assisting the community and the programmes organised to create more awareness and provide accurate vaccination information have undoubtedly made this programme a success.

We are pleased to be part of the National COVID-19 Response Team and hope that such a programme will be replicated by others to assist the Orang Asli communities and other vulnerable groups. It is not impossible for personnel from the universities and teaching hospitals to sometimes go beyond their usual routineto participate in such programme as we are in this together to help our community.■

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This opinion write up was prepared by A/Prof Dr Hazreen Abdul Majid, Head, Centre for Population Health, Universiti Malaya and leading for the UMMC Outreach Program, Phase 2 UMMC vaccination team. The Phase 2 UMMC vaccination program is led by Puan Chew Yee Yean, Deputy Director (Professional Services) UMMC and co- chaired by A/Prof Dr Dr Sharifah Faridah Syed Omar.

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