

pulse@UM

- » From Proteomics to People: A Leader's Approach to Building Successful Research Teams
- » Leadership in Research: The Case of RESPIRE
- » Beyond Boundaries: Navigating Global Research Collaboration through Perseverance
- » Celebrating 20 Years of Collaboration to Improve Outcomes in Childhood Acute Lymphoblastic Leukemia
- » REBUNG: Breaking Down Barriers in Cancer Screening



Research Leadership

TABLE OF CONTENTS



03 FOREWORD FROM THE DEPUTY DEAN OF RESEARCH

04 COVER STORIES:

- 04 From Proteomics to People: A Leader's Approach to Building Successful Research Teams
 - 06 Celebrating 20 Years of Collaboration to Improve Outcomes in Childhood Acute Lymphoblastic Leukemia
 - 08 Beyond Boundaries: Navigating Global Research Collaboration through Perseverance
 - 10 Leadership in Research: The Case of RESPIRE
 - 12 REBUNG: Breaking Down Barriers in Cancer Screening
-

14 SPECIAL HIGHLIGHTS:

- 14 Discovery of Novel Exosome-based Biomarkers for Machine-learning Assisted Biosensing in Lung Cancer Screening
 - 16 Celebrating Innovation, Industry & Community Engagement
-

18 ACHIEVEMENTS

25 UPCOMING EVENTS

FOREWORD FROM THE DEPUTY DEAN OF RESEARCH

Greetings, dear colleagues!

It gives me great pleasure to announce our first issue of *Pulse@UM* for the year 2023. I hope the year has been a fruitful one for all.

The Faculty of Medicine is blessed with many gifted and experienced researchers. These researchers have not only been tirelessly producing top-notch publications but they have also nurtured and inspired young researchers, paving the way for yet more high-quality and impactful research for the community. That is why we dedicate this issue to our researchers.

The theme 'Research Leadership' pays tribute to our research stalwarts. In our cover stories, you will read about Associate Professor Dr Puteri Shafinaz Akmar and her experience in spearheading the way forward in proteomic research, including comparative proteomic analysis as well as proteomic workflows on natural products and herbal medicine. You will also read about Professor Dr Hany Ariffin and her efforts in the 'Ma-Spore' initiative, a collaboration going back 20 years between Malaysia (Universiti Malaya) and Singapore (National University of Singapore) that was formed to study innovations in treatment for childhood Acute Lymphoblastic Leukaemia.

Apart from that, Professor Dr Ong Teng Aik and Dr Jasmine Lim write about research efforts in the area of prostate cancer, specifically shedding light on the Asian Prostate Cancer (A-CaP) collaborative and a Malaysian cohort, the Malaysian Prostate Cancer (M-CaP)

study. The National Institute for Health and Research Unit of Respiratory Health (RESPIRE) project headed by Honorary Professor Dr Khoo Ee Ming is also featured. The write-up by Professor Dr Nik Sherina describes how RESPIRE has been instrumental in studying respiratory diseases in Malaysia since 2017, namely in acute care, tuberculosis, pneumonia and now asthma, COPD as well as lung cancer.

A feature by Dr Leo Bey Fen and Dr Subhashini Raj Kumal elaborates on their work in novel exosome-based biomarkers as a more effective approach to screening for lung cancer. Professor Dr Nur Aishah and the Reduce Breast and Other Cancers Early Diagnosis (ED) Barriers in the Urban B40 Group (REBUNG) project describes how REBUNG 1.0 and 2.0 have helped the urban B40 in easing the cancer screening process.

In our special highlights section, you will find snippets from our recent Faculty of Medicine Research Carnival from 2022. We also listed the many achievements of our researchers. I congratulate all of you for your contributions that resulted in a significant year-on-year jump in our Times Higher Education Impact Rankings 2023 to ranks of 101-200.

I hope you find this issue to be an inspiring and enjoyable read!



**Professor Dr Sanjay Rampal
Lekhraj Rampal**

Pulse@UM is a tri-annual research bulletin in English published by the Faculty of Medicine at the Universiti Malaya (UM). The views and opinions expressed here are those of the author(s) and do not necessarily reflect those of UM, and the editorial board. Materials from the Bulletin may be reprinted with proper attribution.

If you would like to learn more about the information from this bulletin, or would like to contribute or subscribe to future issues, please get in touch with us at:
editorialpulse@um.edu.my.

For the online version of this bulletin, visit:
resfom.um.edu.my/pulse-um

CONTRIBUTORS

We would like to acknowledge and thank the following contributors to this issue:
Leo Bey Fen, Subhashini Raj Kumal, Hany Ariffin, Jasmine Lim, Ong Teng Aik, Nik Sherina Hanafi, Khoo Ee Ming, Puteri Shafinaz Akmar, Abdul Rahman, Nur Aisyah Mohd Taib

EDITORIAL BOARD

Advisors:
April Camilla Roslani, Sanjay Rampal, Lekhraj Rampal

Editor-In-Chief:
Christine Shamala Selvaraj

Editors:
Tan Kae Yi, Kee Boon Pin, Nur Afiah Mohd Salleh, Tan Choo Hock, Mohamad Shafiq Azanan, Jaime Jacqueline Jayapalan, Haslinda Lahuddin

Designer:
Mohamad Shafiq Azanan

COVER PHOTO

Licence obtained from Shutterstock

From Proteomics to People: A Leader's Approach to Building Successful Research Teams

Associate Professor Dr Puteri Shafinaz Abdul Rahman is a proud alumnus of Universiti Malaya who has significantly contributed to the university in various capacities. After completing her Ph.D. in Proteomics in 2007, she joined the Department of Molecular Medicine at the Faculty of Medicine, where she is now the

Head of the Central Research Laboratory (CRL).

Dr Puteri is also a founding member and the current head of the Universiti Malaya Centre for Proteomic Research (UMCPR). Her research involves comparative proteomics analysis, in which she specialises in developing proteome

profiles of biological and clinical samples to search for specific diagnostic biomarkers. Her team also uses proteomic workflows on natural products and herbal medicine to understand their benefits and unravel their mechanistic basis for treating various diseases.



Figure 1: Aidifitri 2023 with the creative, fun and dedicated CRL team

Apart from her research and teaching duties, Dr Puteri has held several administrative posts under the portfolio of DVC Research & Innovation in the past, including Deputy Dean of the Innovative Technology Research Cluster and Deputy Dean of Frontiers of the Natural World Research Cluster. She has also been serving in the port of the Coordinator of Research Project Monitoring Section at the Institute of Research Management and Services since her appointment in early 2023.

Dr Puteri's leadership, expertise, and dedication have made her an asset to the University of Malaya. In this article, we will focus on her leadership role as the Head of CRL and how she has emphasised teamwork in her leadership style.

"As an individual tasked with multiple roles, I have had the opportunity to work not only on research and teaching but also on administration. In particular, my involvement as the Head of CRL has been a highlight of my time at the Faculty," she said.

CRL is a designated facility that integrates an enhanced laboratory ecosystem and state-of-the-art equipment for research, providing laboratory support to researchers and clinicians who need assistance to initiate their research activities or programmes. Since 2008, the laboratory has grown significantly. It now includes two satellite labs designated for mammalian cell culture, molecular biology, and translational workflow. As the labs grew, so did the array of services provided, including the FOM Calibration Lab and FOM Supply Store. The lab was also selected as the 'OSHE reference

laboratory' at the Faculty, and the proteomics facility received the accredited status of MS ISO/IEC 17025:2015 and 17025:2017 for the Mass Spectrometry Service for protein identification. All of this aligns with CRL's mission to be a leading central research facility supporting research advancement and excellence at the FOM and UM.

Despite her numerous achievements, Dr Puteri remains humble and attributes her success to the dedicated and skilled staff of the CRL team. By creating a supportive environment and promoting open communication, she has achieved great things with her team of lab managers, two science officers, and 12 medical lab technologists. The support staff has been trained to a high competency level to handle complex instrumentation, perform customised bioassays, and provide quality analytical services. They have also undergone reskilling to conduct and design safety induction training and experimental-based training held for postgraduate students, research assistants, and staff.

In Dr Puteri's view, her most significant achievement is not only her personal success in research, publications, and postdoctoral outcomes, but also, the satisfaction she feels for building and nurturing the human capital development of the team, which is UM's hidden asset. As Henry Ford once said, "If everyone is moving forward together, then success takes care of itself."



Puteri Shafinaz Akmar Binti Abdul Rahman
Department of Molecular Medicine

Acute lymphoblastic leukemia (ALL) is the most common childhood cancer. Annually, approximately 1200 Malaysian children are diagnosed with a malignancy, with ALL accounting for a third of these. Between 1995 and 2002, Malaysian hospitals utilized treatment regimens based on the Dutch-DCOG 7 and German BFM protocols for children with ALL. By 2002, the overall 6-year event-free survival (EFS) for childhood ALL in Malaysia stood at a lowly 56%. This served as a call to arms for the paediatric oncologists in Universiti Malaya (UM).

Celebrating 20 years of Collaboration to Improve Outcomes in Childhood Acute Lymphoblastic Leukemia

The following year, UM began a collaboration with its Southern sister, National University of Singapore for the treatment of childhood ALL - coining an amalgamated name, "Ma-Spore". The first collaborative trial was the seminal Ma-SporeALL2003 study which utilized PCR-based minimal residual disease analysis to risk stratify patients according to disease severity and guide treatment intensity.

Hotline

Whilst Singapore is a small city-state with excellent communication and transport systems, the UM team had to contend with

the geographical landscape and existing infrastructure in Malaysia at that time. Malaysian patients were not pre-selected but referred from peripheral hospitals throughout the country and returned to their home states during large periods of the protocol. Twenty years ago, segments of the chemotherapy protocol had to be administered by general paediatric colleagues and nurses who were not specifically trained in oncology in the various state hospitals. To bridge this gap, the UM team practiced a mandatory weekly telephone update with colleagues serving the areas where the patients had returned to so that each patient's progress could be documented and their treatment protocol

tweaked. As this was the pre-mobile phone era, a dedicated 'hotline' to the UM paediatric oncology team was also implemented so that parents could call directly if issues arose.

Money - and the need for it

It takes considerable funds to conduct a multi-centre clinical trial; and even more so if investigator-initiated. Financial support was a major early challenge for the Ma-Spore group. Fortunately, the two teams successfully obtained funding, not only from government agencies but also from philanthropic organisations, corporate partners and

individual donors. Multiple projects to pass around the proverbial hat was a prerequisite to success!

When the trial concluded in March 2011, 559 subjects aged under 18 years had been recruited including infants and children with Down Syndrome. The trial resulted in an improvement in 6-year EFS for both countries, at 80%, with an overall survival (OS) of 88% [1]. Most encouraging was the fact that the results of Ma-SporeALL2003 were comparable to trials of large international groups conducted during the same era, such as St Jude Total XV (5-year EFS, 85.6%) and the Dutch Children's Oncology Group ALL 9 (81%).

Consolidating a successful partnership

The follow-up study, Ma-Spore ALL2010, focused on delivering therapy that was more intensive for those in the high-risk group while reducing intensity for standard and intermediate risk groups. Anthracyclines, a key component of leukemia therapy, was completely omitted for the low-risk group. The study also took into consideration patients with IKZF1 gene deletion (IKZF1del) and moved these patients into a higher risk category. Increasing treatment intensity for patients with IKZF1del resulted in a reduction in the 5-year cumulative incidence of relapse (CIR) from 30 to 13% and improved overall 5-year survival from 69% to 91% [2]. In 2021, IKZF1del analysis using the multiplex ligation-dependent probe amplification platform was established in UM using an innovation grant from MOSTI. The Ma-SporeALL2010 trial also studied TPMT and



Figure 1: A patient receiving treatment in UMMC

NUDT15 gene variants in its patient population for precise dosing of thiopurine drugs such as mercaptopurine. Asians are more sensitive to thiopurines and thus, may suffer more toxicities from over-dosing [3].

Two decades of cooperation and friendship

The UM-NUS collaboration has moved into its next phase (MaSporeALL2020). Precision medicine and risk-adapted therapy remain the cornerstone strategies for childhood ALL, especially in the era of increased recognition of late effects amongst survivors of childhood cancer [4]. The focus of the current trial is on discovery of molecularly distinct subtypes by RNA-sequencing and designing safer therapies to ensure children who survive ALL are unencumbered in their adulthood by a myriad of treatment-related late-effects ■

Hany Ariffin

Department of Paediatrics



Singapore 350km →



References: [1] Yeoh AE, Ariffin H, et al. J Clin Oncol 2012; 30(19):2384-92. PMID: 22614971; [2] Yeoh AE..., Ariffin H. J Clin Oncol 2018; 36(26):2726-2735 PMID: 30044693; [3] Tanaka Y, et al. Haematologica 2021;106(7):2026-2029. PMID: 33504140; [4] Ariffin H, et al. Cancer 2017; (21):4207-4214. PMID: 28654149

BEYOND BOUNDARIES: NAVIGATING GLOBAL RESEARCH COLLABORATION THROUGH PERSEVERANCE

In an age of increasing globalisation, the world has become more integrated with the intensified spread of knowledge and technology through multiple channels. One of the major changes facing universities across the globe is research priorities and mission statements. Global research collaboration can be complex, challenging and even daunting in some cases. Thus, good leadership is vital in navigating the success of research collaboration.

Prostate cancer has generated enormous interest amongst the research community over the last decades. The introduction of prostate-specific antigen (PSA) screening and paradigm shift in prostate cancer management have led to early detection and better survival amongst prostate cancer patients after receiving treatment. Ironically, a low prostate cancer incidence estimate (ASR 13.6 per 100,000) is reported in Asia, with a relatively high mortality rate (ASR 4.4 per 100,000) compared to Western populations. In 2015, the Asian Prostate Cancer (A-CaP) Study was launched by the University of Tokyo to provide further insights into recent trends of

prostate cancer across Asian countries including Japan, South Korea, China, Singapore, Malaysia, Thailand, Indonesia, Philippines and Vietnam. In Malaysia, Professor Dr Ong Teng Aik and Dr Jasmine Lim were invited to join this international consortium and jointly lead the Malaysian cohort named the Malaysian Prostate Cancer (M-CaP) Study. It is an inaugural longitudinal prostate cancer cohort study involving eight Ministry of Health Hospitals nationwide, with the aim of investigating disease characteristics, treatment response and survival outcomes of Malaysian patients compared to those of other Asian countries. To ensure the sustainability of the M-CaP Study, the team endeavoured to secure seed funding from University of Tokyo, Japan and the Malaysian Ministry of Health-NIH research grant (2017-2023), although public research funding has been under budgetary pressure in recent years. The M-CaP study recruited more than 1,100 newly diagnosed prostate cancer cases between 2016 and 2018 nationwide and has followed up over a period of 48 months, to date. The findings from this international collaborative work have been shared through numerous lead and co-authored scientific papers.

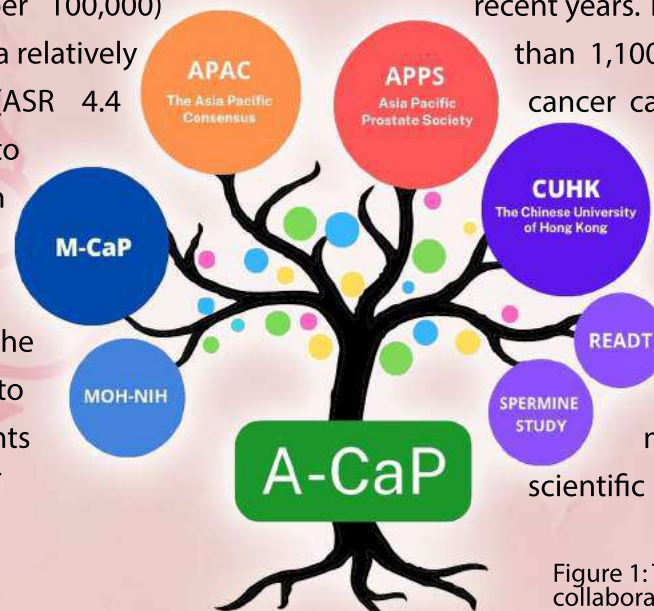


Figure 1: The growth of global research collaboration networks



Figure 2: Ong and Jasmine attended the A-CaP annual meeting in Seoul, Korea 2017.

In addition, the active involvement of Professor Dr Ong Teng Aik in Asia Pacific Prostate Society (APPS) and Asia Pacific Consensus (APAC) increases the team's visibility significantly at the global stage. With the collaborative trust, this international research collaboration continues to flourish, particularly across Asia. For instance, the international collaboration with the Chinese University of Hong Kong is further enhanced with ongoing trials including READT (Real-life evaluation of the effect of ADT in prostate cancer patients in Asia) and SPERMINE studies. Herein lies one of the team's favourite inspirational quotes:

"One piece of log creates a small fire, adequate to warm you up. Add just a few more pieces to blast an immense bonfire, large enough to warm up your entire circle of friends; needless to say, that individuality counts, but teamwork dynamites." – Jin Kwon



Ong Teng Aik
Department of Surgery



Jasmine Lim
Department of Surgery

Four key points to plant the seeds to grow effective research collaboration

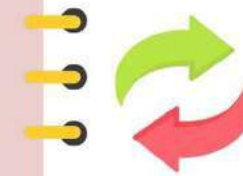
It's "everything everywhere all at once"!

Expertise



One must focus on 1-2 specialties. Be an expert of that particular field and generate knowledge through active clinical activities, research projects, grants, presentations, publications etc. This will lay a significant foundation for local, regional and international collaboration.

Exchange



One must actively search for platforms for interactions with others. It can be physical or virtual conference, seminars, workshops etc.

Effort



One must put real effort into intellectual networking. Sitting passively at the back won't propel us forward. Start sharing name cards and contact details in networking events. Be present in social media. Plant the seeds as early as possible.

Enthusiasm



Be proactive and enthusiastic in initiating networking efforts. One must show leadership capability in collaborative networking and take the lead when opportunities arise. A lackluster attitude is a bellwether of failure and breakdown in any collaboration.

Research collaboration is like planting seeds. Planting is easy. Consistently watering and nurturing with sunlight, nutrients and plenty of love is tough, yet essential. There are no hard and fast rules to tending your collaboration network.

Respiratory conditions account for around one in five of all deaths in South Asia. Recognising this situation, the National Institute for Health and Care Research (NIHR) at the University of Edinburgh funded the Global Health Research Unit focusing on respiratory health in Asia (RESPIRE). From the initial meeting in University of Edinburgh in 2017, and a regional meet in Bangladesh in 2018, RESPIRE progressed with research on chronic respiratory diseases in four low- and middle-income countries (LMICs), namely Malaysia, Bangladesh, Pakistan and India, supported by a seven-million-pound grant from NIHR over nearly five years. In Malaysia, the burden in respiratory medicine has historically been on acute care, tuberculosis and pneumonia; it now includes chronic conditions such as asthma, chronic obstructive pulmonary disease (COPD) and lung cancer. However, despite significant morbidity and mortality in respiratory diseases, research and evidence is still lacking.

In Malaysia, the two partners for RESPIRE are Universiti Malaya and Universiti Putra Malaysia. There are several facets to RESPIRE research in Malaysia. These include (1) improving asthma control in the Klang Asthma Cohort, (2) developing a self-management intervention for people with asthma, (3) estimating the chronic respiratory disease (asthma and COPD) burden, (4) the asthma Hajj study, (5) exploring provision of supportive care for patients with severe and

potentially life-threatening COPD, (6) studying the psychological issues of the primary care team amidst COVID-19 pandemic, (7) carrying out pulmonary rehabilitation for patients with chronic respiratory diseases and (8) strengthening innovation research and implementation capacity in digital health in response to the COVID-19 pandemic. All projects were completed between 2018 and 2022, resulting in 67 publications, numerous scientific paper presentations and 10 PhD graduates from the four countries. Malaysia had two PhD graduates and one Fellow from the 2017-2022 grant. Honorary Professor Dr Khoo Ee Ming led the Malaysian RESPIRE projects from 2018 to 2022, with each RESPIRE project having a lead co-principal investigator.

Effective leadership is vital in ensuring the success of research. Successful research requires collaboration. Collaboration, both at national and international levels, is essential to ensure sharing of new ideas and tapping into new resources. RESPIRE has strong collaborations with other RESPIRE partners and researchers from other countries, particularly from the United Kingdom. Locally, we collaborated closely with the Ministry of Health, Hospis Malaysia and various governmental agencies. With research being very much people-based, effective leadership requires the skills and ability to establish networks, reaching out to people with the necessary skills and like-mindedness, working as a team.

Leadership in research: The case of RESPIRE



Figure 1: RESPIRE team members pictured at the 2019 Annual Scientific Meeting in Kuala Lumpur

With RESPIRE having several projects going on simultaneously, it is important that the leadership is able to manage the team effectively. An important aspect is to establish a thriving research culture and to maintain the camaraderie within, allowing the group to grow and move. Capacity building is a priority, making sure training is incorporated into the research programme. Stakeholder engagement is crucial; this engagement should include policymakers, patients and members of the public.

Another crucial leadership component is being disciplined with the research process, such as recognising timelines, keeping to the planned budget, producing reports and outputs. While regular discussions and meeting are important, it is crucial that those sessions are focused, effective and kept within the planned allocated time.

RESPIRE has expanded into RESPIRE 2, having obtained another NIHR Global Health Research Unit grant of seven million pounds for seven LMICs for 2022-2026. Honorary Professor Dr Khoo Ee Ming now co-leads RESPIRE 2 with Professor Harry Campbell from University of Edinburgh. RESPIRE 2 will continue to address gaps in health services and needs related to chronic respiratory diseases, aiming to reduce the impact and number of deaths from these conditions in Asia.



Nik Sherina Hanafi
Department of Primary
Care Medicine



Khoo Ee Ming
Department of Primary
Care Medicine

1. Sheikh A, Campbell H, Balharry D, Baqui AH, Bogaert D, Cresswell K, Cunningham S, Dockerell D, El Arifeen S, Fletcher M, Grant L. RESPIRE: The National Institute for Health Research's (NIHR) Global Respiratory Health Unit. *Journal of Global Health*. 2018 Dec;8(2).
2. NIHR Global Health Research Unit on Respiratory Health (RESPIRE) The University of Edinburgh. [<https://www.ed.ac.uk/usher/respire>]

REBUNG : Breaking Down Barriers in Cancer Screening

Research leadership in the local setting faces serious issues and implications. Greater emphasis on profit driven research from government funders will need researchers to be creative in writing their research proposals. Creating a conducive environment for research by the university is important, as unstable research support, for example, legal support, limits the capacity of our researchers to apply for competitive international grants. Additionally, many of the research products never get to the unicorn stage as the fast-changing world cannot wait for products that answer the problems of yesterday.

Immersing myself into the problem of why women present with advanced cancer, I had the opportunity to conduct in-depth interviews with patients during my doctorate (2008-2011). After that, I supervised a PhD student in the same area, who looked at delays in the diagnosis and treatment of breast cancer patients in six public hospitals in Malaysia. There were the tensions of addressing my many areas of research interests, handling High Impact Research Grant from 2012 to 2016 and continuing collaborations with Cancer Research Malaysia and Professor Dr. Yip Cheng Har. Additionally, ensuring the continuity of clinical services and expansion of our services by adopting recent techniques and technologies, despite the constant threats of new lecturers and surgeons tracking out to private practices, required iron-clad plans.

In order to impact the underserved and to address issues of late presentation, we needed to push ahead at the national level to work with stakeholders. Through close relationships with, and leadership, from colleagues from Ministry of

Health (MOH), we participated in the first MOH national exit exams in 2015. Finally in 2017, a move by the department to separate clinical and research headship provided a great avenue for me to finally focus on my call, to focus on the Universiti Malaya Cancer Research Institute (UMCRI).

The city cancer challenge is a movement of cities to provide sustainable equitable quality cancer care. Through UMCRI, UM supported this endeavour as a co-applicant with National Cancer Society Malaysia to bid for the Greater Petaling City Cancer Challenge which we won in 2019. The REBUNG study entitled "Development of an Expedited Diagnostic Pathway Tool to Reduce Breast and Other Cancers Early Diagnosis (ED) Barriers in the Urban B40 (uB40) Group (REBUNG) in Selangor" was born with the second cycle of the UM Interdisciplinary Impact Research Grant (IIRG).

REBUNG 1.0 is an implementation science research with three interdisciplinary research between the Faculty of Medicine (FoM) and Faculties of Arts (FoA) and Law (FoL). The project proved that multiple sectors can partner to deliver a campaign and alternate patient-centric pathways to the uB40 community. Involvement of community leaders from the municipal council, mosque, and "ketua blok" in collaboration with cancer NGOs can provide not just supportive services but multiply their existing resources.

It is unfortunate that lower appreciation for impactful non-profitable research by the government caused lower success rates in obtaining these major research funds in the past. I for one, have had many rejections and failures to obtain grants, due to the lack of understanding in



Figure 1 and 2: The REBUNG team

implementation science research projects. However, the game-changers – the UM Cares and UM IIRG have given our team realise their passion for community implementation research. The team have been blessed and the project has given many opportunities to work on areas that may not be traditionally thought to be cutting edge research but impactful, nevertheless. Since then, the funding landscape has moved towards larger collaborative and challenge-led projects, by having some track record in this area of research, opportunities for larger international grants can be realised.

The REBUNG project now comprises 5 main subgroups and 5 main cancers that transcends departments and faculties (surgery, primary care, nursing, medicine at FoM and FoA, FoL and Faculty of Science) to address the problems associated with late presentation of cancer. For this, we thank our multisectoral collaborators from MOH, Ministry of Women and Family, Community Development, National Cancer Society Malaysia, cancer NGOs and community organisations that gave us the trust to execute the study at our pilot sites. Going forward, REBUNG 2.0 will be implemented with the



REBUNG stakeholder engagement and management framework in a second pilot site in Kampung Chempaka funded by MBPJ SEED grant and the UICC early breast cancer grant.

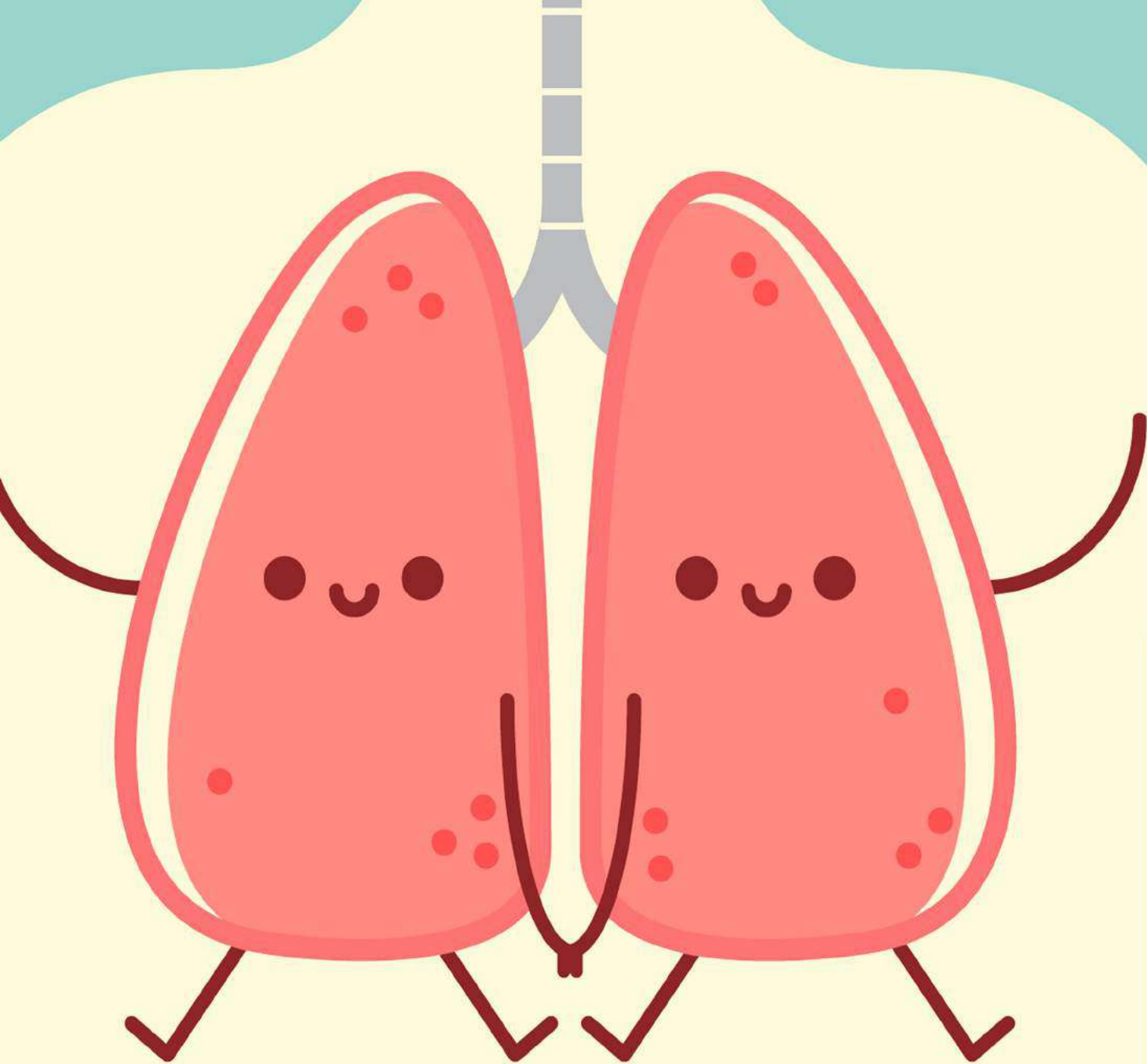
Research leadership involves many different skill sets and competencies essential to producing research excellence and building a positive research culture. Thus, team work, being respectful, compassionate communication and cultivating leaders within the clinical and research projects are crucial to sustain the projects in our environment. Who would have thought compassionate listening, reflective practice and embedding oneself within the system one wants to change are key components to successful research leadership. From the REBUNG experience, I believe these key components have been validated! ■



Nur Aishah Mohd Taib
Department of Surgery

Visit our website for more information on:

- REBUNG key stakeholders and tools - <https://umcri.um.edu.my/rebung>
- Cancer health literacy - <https://www.youtube.com/channel/UC94T6UD41bUJD3vIR7Yv34g/videos>



Discovery of Novel Exosome-based Biomarkers for Machine-learning Assisted Biosensing in Lung Cancer Screening



Leo Bey Fen
Department of
Molecular Medicine



Subhashini Raj Kumal
Department of
Molecular Medicine

Lung cancer remains the leading cause of cancer death worldwide, with an estimated 1.8 million deaths in 2020 [1]. Despite advances in treatment options, the high mortality rate for lung cancer is largely attributed to the advanced stage at diagnosis, underscoring the urgent need for sensitive screening methods for early detection. Currently, low-dose computed tomography (CT)-based screening is the most effective method for early detection but is limited by its high operative cost and false-positive rates [2]. As such, there is an urgent need for a more cost-effective and feasible screening method for lung cancer.

With the support of the Impact Oriented Interdisciplinary Research Grant (IIRG), the research team led by Dr Leo Bey Fen is currently exploring the potential of biosensors as an alternative approach for lung cancer screening. The team identifies novel lung cancer-associated biomarkers as multiplex detection targets through comparative proteomic analysis of surface proteins on exosomes derived from plasma of individual with lung cancer and lung cancer-free individuals. Based on the biomarkers, a biosensing nanocomposite containing anti-fouling peptides is synthesised for exosome detection in blood plasma. Apart from this, our engineering team is developing an easy-to-use portable reader to facilitate point-of-care testing. Moreover, we believe that the use of identified biomarkers to develop a machine learning-based lung cancer prediction model could further enhance detection accuracy, improving clinical implementation of biosensing for lung cancer screening.

References:

- Sung, H.; Ferlay, J.; Siegel, R. L.; Laversanne, M.; Soerjomataram, I.; Jemal, A.; 1. Bray, F., Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J. Clin.* 2021.
- Hoseok, I.; Cho, J.-Y., Lung cancer biomarkers. *Adv. Clin. Chem.* 2015, 72, 107-170.

Background are modified from Freepik - www.freepik.com

This interdisciplinary research combines nanobiotechnology, biomarker discovery, and machine learning that gathers experts of various disciplines, including Associate Professor Dr Chen Yeng, Dr Effariza Hanafi, Dr Subhashini Raj Kumal, Dr Farid Nazer Faruqu, Dr Anis Salwa, Dr Tan Jiunn Liang and Dr Loh Thian Chee. We are certain that developing affordable screening devices for the early detection of lung cancer will bring a significant impact on public healthcare, by providing opportunities for regular, large-scale lung cancer screening for at-risk individuals like smokers and patients in remission, which could improve early detection rates and ultimately reduce the burden of this devastating disease, especially in middle to low-income communities ■



Figure 1: Electrochemical biosensing of exosomes using a potentiostat.

For more information, please visit our website and social media pages:

-  <https://umluced.wixsite.com/website>
-  Lung Cancer Early Detection -Lu.CED UM
-  [luced_um](#)
-  [UM_LuCED](#)

Celebrating Innovation, Industry & Community Engagement

The Faculty of Medicine (FOM) Research Carnival 2022 was a great opportunity to showcase our health research / innovation, meet researchers & industry partners as well as discover how research affects and changes our community health & well-being. It was funded jointly by FOM and industry partners, attracting more than 1000 attendees physically and virtually.

There were multiple programs for researchers, postgraduate students and school children, including seminars, panel discussions, interactive workshop, live experiment, pitch competition and much more! In the mixed reality session with Microsoft Malaysia, the participants were fascinated with the application of HoloLens in clinical teaching as well as its potential in transforming medical education, empowering health team collaboration and enhancing patient treatment. We also learnt about the commercialisation journey of Prof. Dr. Vickneswaran Mathaneswaran, bringing his innovation to the next level for the benefits of neurosurgical patients, albeit with several challenges. In addition, Program ROSE was truly inspirational, applying a revolutionary, evidence-based scientific approach to cervical cancer screening in Malaysia. Prof. Dr. Yin Ling Woo shared her mission with various community

organizations, professional bodies, industry partners and policy makers to empower women eliminating cervical cancer.

In a nutshell, innovation without execution is just hallucination. It is essential for us to bridge the gap from the world of ideas into the realm of reality with the participation of industry and community. ■

Video recordings throughout the carnival can be accessed at YouTube via the following link:
<https://shorturl.at/EFIPX>



Figure 1: Prof. Ir. Dr. Shaliza Ibrahim (Associate Vice Chancellor Research & Innovation) inaugurated the carnival.



Figure 2: Prof. Dr. April Camilla Roslani (Dean of Medicine) gave a welcoming speech.



Figure 3: Carnival participants tried the mixed reality goggle technology by Microsoft.



Figure 4: A carnival participant tried the exergaming demo.



Figure 5: Participants of KIDScience Lab performing a mini experiment.



Figure 6: Audiences had a chance to see up close various types of mushrooms.



Jasmine Lim
Chair of FOM Research Carnival 2022
Department of Surgery

Congratulations



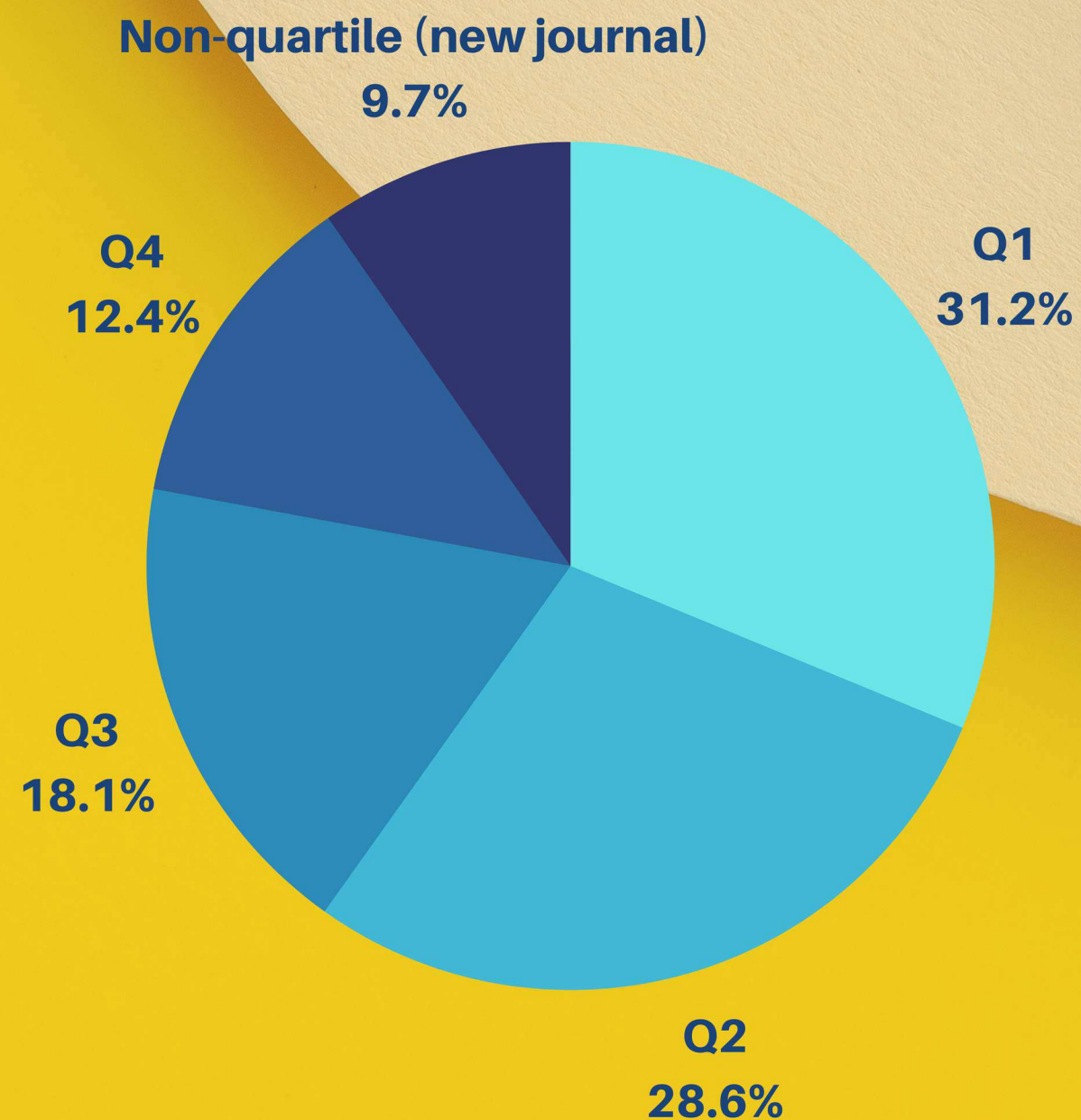
UNIVERSITI
MALAYA



Surged one band
in the ranking
from 201-300
in 2022!

PUBLICATION RECORDS FOR 2022

TOTAL
PUBLICATIONS: **919**



Total Value of Grants Received in 2022 for Faculty of Medicine

RM22,958,569.07

122

GRANTS RECEIVED



Internal or
Government Grant

RM 11,151,002.39

National
Private Grant

RM 913,483.00

International
Grant

RM 10,894,083.68

TOP 10 RECIPIENTS

International grants



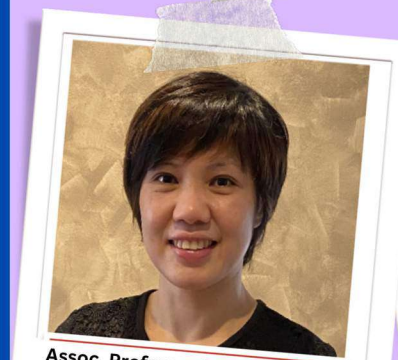
Honorary Professor Dr Khoo Ee Ming
(Primary Care Medicine)
RM5,056,289



Assoc. Professor Dr Reena Rajasuriar
(Medicine)
RM1,387,452



Professor Dr Chan Yoke Fun
(Medical Microbiology)
RM1,081,320



Assoc. Professor Dr Chang Li Yen
(Medical Microbiology)
RM818,359



Dr Puah Suat Moi
(Biomedical Science)
RM669,915



Professor Dr Chua Kek Heng
(Biomedical Science)
RM478,144



Assoc. Professor Dr Lim Lee Ling
(Medicine)
RM446,293



Professor Dr Yvonne Lim Ai Lian
(Parasitology)
RM409,230



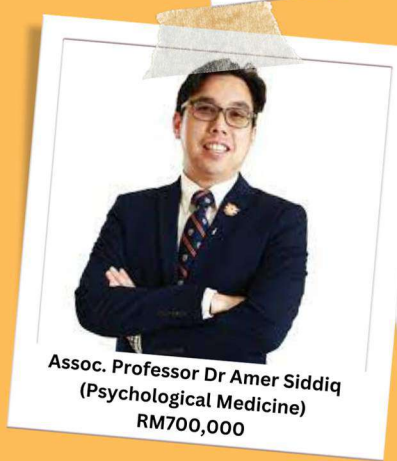
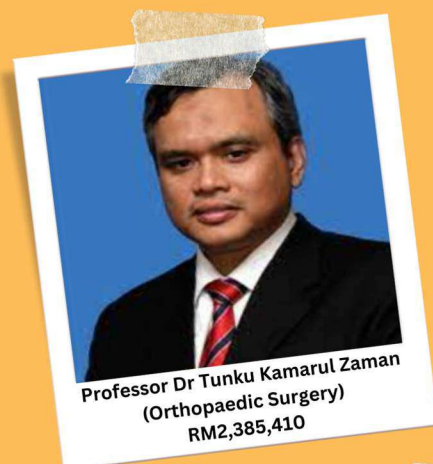
Assoc. Professor Dr Raja Iskandar Shah
(Medicine)
RM281,128



Professor Dr Lau Yee Ling
(Parasitology)
RM267,215

Congratulations

TOP 10 RECIPIENTS *National grants*



Congratulations

TOP 10 RECIPIENTS *Clinical Investigation Centre grants*



Congratulations



Congratulations!

TOP DEPARTMENT 2022

(BASED ON RATIO OF PUBLICATIONS PER STAFF)

CLINICAL DEPARTMENT

NURSING SCIENCE

Ratio: 3.4:
Total: 37 publications



MEDICINE

Ratio: 2.7:
Total: 209 publications



REHABILITATION MEDICINE

Ratio: 2.5:
Total: 20 publications



NON-CLINICAL DEPARTMENT

PARASITOLOGY

Ratio: 5.2
Total: 52 publications

SOCIAL & PREVENTIVE MEDICINE

Ratio: 5.0
Total: 112 publications

PHARMACOLOGY

Ratio: 4.7
Total: 62 publications

ACADEMIA MONTH & RESEARCH CARNIVAL 2023

THEME:
**CELEBRATING 50 YEARS OF MEDICAL
SPECIALTY TRAINING: RESEARCH & ACADEMIC
EXCELLENCE THROUGH GLOBAL NETWORKING**

02 - 06 OCTOBER 2023

TJ DANARAJ AUDITORIUM
FACULTY OF MEDICINE





Research Office,
Dato Panglima Kinta Eusoff Research Center,
Level 3, Block I,
Faculty of Medicine,
Universiti Malaya,
50603 Kuala Lumpur

Tel: +603-7967 7515



Email address: resfom@um.edu.my

Research Office website: <https://resfom.um.edu.my>

Faculty of Medicine website: <https://medicine.um.edu.my>



Research Office - FOM UM



@fom_um



@fom_research_um