

RISE

Catalysing Global Research Excellence

Robotics Technology:

Driving Innovation, Transforming Future

**ReNeU's 1st
Anniversary**
Galvanising Research Excellence

**UiTM's Global Effort
in Training Young Aspiring
Neuroscientists**



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ABOUT THE MAGAZINE

RISE Magazine is published by Office of the Deputy Vice-Chancellor (Research & Innovation) with the aim of highlighting the research and innovation on of experts from multidisciplinary fields in UiTM. It serves as a platform for researcher to showcase their high quality and impactful findings, activities and innovative solution through publication. Contribution of these ideas come from academicians, researchers, graduates and universities professionals who will enhance the visibility of research and strive to elevate Universiti Teknologi MARA to global standards. This is an effort to promote research as a culture that should be embraced by everyone.

ABOUT UiTM

Universiti Teknologi MARA (UiTM) is a public university based primarily in Shah Alam, Malaysia. It has grown into the largest institution of higher education in Malaysia as measured by physical infrastructure, faculty and staff, and student enrollment. UiTM is the largest public university in Malaysia with numerous campuses throughout all 13 states in Malaysia. There is a mixture of research, coursework and programmes offered to the students. Office of the Deputy Vice-Chancellor (Research & Innovation) or known as TNCPI (*Timbalan Naib Canselor (Penyelidikan & Inovasi)*) serves a *Pusat Tanggungjawab (PTJ)* that navigates the research and innovation of university in achieving UiTM agenda. TNCPI office strives to mobilise the faculties, and campuses to move together and promotes cooperation among researchers in bringin UiTM as a leading global university of science, technology, and innovation by 2025.



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FOREWORD

VICE-CHANCELLOR



To excel globally, research must be weighed in as a key factor to navigate the university's direction in making an impact. This is especially when focusing on translational research where society can benefit greatly from its findings.

Congratulations to the Office of the Deputy Vice-Chancellor (Research and Innovation) on the publication of this magazine, aptly called RISE. I am pleased to see that the COVID-19 pandemic has not dampened UiTM researchers' pursuit of their dreams. The contents of these pages allow active research and innovation activities be shared with our stakeholders, local and international collaborators.

As UiTM aspires to be a world-renowned university by 2025, I believe that our current research practises are on track. For example, the featured article in the magazine highlights the key success of robotic technology ventured by our researcher, Associate Professor Dr Hanafiah Yussof, who formed a start-up company to advance robotic technology in Malaysia. His contribution to the robotics industry, the Robot Rehabilitation System for Autism Therapy, is an example of innovation that can transform the future.

In our pursuit of changing the future, we at UiTM are cognisant of the current and future direction of research to facilitate research from different disciplines. We have researchers using drones for pineapple plantations, exploring hybrid rockets with Equatorial Space System (ESS), and researching sanitation, collection, and sewage/wastewater treatment systems with Indah Water Konsortium (IWK) Sdn Bhd, to name a few of the work we have been actively involved in.

Hence, we will continue to contribute and make progress associated with processes and knowledge pivotal for impactful research, especially in developing knowledge-based technology that benefit society.

Ultimately, I am confident that the publication of this magazine will further strengthen the visibility of UiTM research and innovation.

Thank you.

PROFESSOR Ts. DR HAJAH ROZIAH MOHD JANOR

Vice-Chancellor

Universiti Teknologi MARA

FOREWORD

DEPUTY VICE-CHANCELLOR (RESEARCH & INNOVATION)



I would like to congratulate the editorial team on the release of RISE, a research magazine highlighting our research and innovation efforts and accomplishments. The magazine exemplifies our office's synergistic and collaborative efforts, as well as those of our researchers and article contributors, to advance the visibility agenda.

As the office in charge of research and innovation, we are constantly hoping that every research result and invention will benefit the community through translational research. Assoc. Prof. Dr Hanafiah Yussof's Robot Rehabilitation System for Autism Therapy, for example, has aided the autism community in improving communication. Even more proud that this endeavour resulted in the formation of a start-up company.

Despite the COVID-19 pandemic, UiTM researchers continued to conduct relevant research activities despite the uncertainty. The scale of the events varies from a small effort to install solar panels at a rural school and organise virtual conferences to the use of drones and precision agriculture technology on pineapple plantations. Notably, a Bioextreem solution capable of inhibiting 99.99 percent of bacteria and viruses was also developed.

With these accomplishments, we will continue to support research efforts, particularly those aimed at developing knowledge-based technology with a social benefit in mind.

Finally, I believe that this magazine can serve as a platform for the visibility agenda by incorporating a wide range of science and research perspective, fostering more potential collaboration between UiTM researchers and local and international institutions and industries.

Thank you.

PROFESSOR Ts. DR MOHD NAZIP SURATMAN

Deputy Vice-Chancellor (Research & Innovation)

Universiti Teknologi MARA

MESSAGE

FROM THE CHIEF EDITOR



Alhamdulillah.

It gives me great pleasure to see this issue published. We received a massive and impactful submission to feature our UiTM community's research stories. Despite the difficult circumstances, UiTM researchers are proactive in carrying out research activities and events within their respective capacities.

Allow me to express my heartfelt gratitude to all of the authors of the articles in this magazine. The publication of this issue would have been far more difficult to achieve without their contributions. Here, we feature Assoc. Prof. Dr Hanafiah Yussof of the College of Engineering's beautiful journey into robotic technology. I believe that robotics has always been on the national agenda for its true mission in helping people. We chose to focus on robotics to honour a UiTM researcher who has dedicated his academic

career to assisting society through technological advancements. To all researchers out there, we hope that his inspiring journey will rekindle our enthusiasm for research.

The inaugural issue of the RISE magazine also features research achievements and the multidisciplinary research areas in UiTM which support national priorities. Research Nexus UiTM (ReNeU) celebrates its first anniversary in 2021, marking a major milestone in its journey. Faculty of Pharmacy is making a global impact towards producing young aspiring neuroscientists. The exploration of Lembah Benua has highlighted the wonderful forest as a potential research station. The potential of fine art logistic industry is also of utmost importance towards making Malaysia as a top art market hub. These are some of the exciting research stories and I invite you to discover more in this issue.

We sincerely hope to bring you more research news from the UiTM family in the coming issues. Have fun reading!

DR MOHD MUZAMIR MAHAT

Head of Research Communication & Visibility Unit (UKPV)

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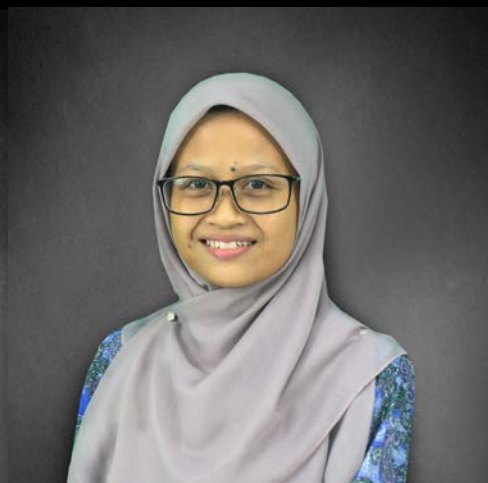
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Collaboration between NEXTGREEN Global and UiTM will strengthen UiTM cooperation with public listed company in zero waste technology and renewable energy for sustainable development



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Hutan Simpan Lembah Benum Exploration 2021



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Faculty of Medicine
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and the Malaysian FH research team

on the successful publication in the flagship journal

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(Impact Factor: 79.321)

**Global perspective of familial hypercholesterolaemia:
a cross-sectional study from the
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Achievements

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*Source: PLoS Biol 18(10): e3000918. <https://doi.org/10.1371/journal.pbio.3000918>

PLOS BIOLOGY



Adaptive Strategies for Microbial Performance Through Optimization Approach

by Assoc. Prof. Dr Khalilah Abdul Khalil



Photo credit : Airtek Environmental Corp Website

Microbial bioprocessing represents an essential part of biotechnological applications. Examples of such processes can be found in many areas, such as the food industry, the pharmaceutical industry, wastewater treatment, etc. Substantial economic benefits can be achieved even from minor performance improvements. Therefore, optimising the productivity of such processes has become a significant issue.

Given the above-described issue, research focusing on optimising various factors to improve the performance of microbial systems has been conducted. The initial work began in 2008 through a PhD research project entitled "Microencapsulation of Bifidobacteria Pseudocatenulatum G4 Within Bovine Gelatin-genipin-alginate Matrices". The optimisation of the cultivation medium for these probiotics resulted in high probiotic biomass production using a low concentration of skim milk medium. Further optimisation of the encapsulating matrices of these probiotics showed better slow-release activity under simulated gastric-intestinal exposure. These studies were successfully patented in 2010.

The optimisation research of probiotics continued after that for biomass production, microencapsulation matrices to enhance stability in the gastrointestinal region, emulsion components to improve stability in fruit juice during storage, and chocolate. Another area being explored is the optimisation of exopolysaccharide production by Bifidobacteria and Lactobacillus strains for colon cancer treatment. In this scope, initial optimisation of environmental conditions for probiotics to attach

to colon cancer cells was observed. One of the criteria for probiotics to boost the host's health benefits is attaching to the cell wall with exopolysaccharide assistance. Currently, the autophagy effect of exopolysaccharides by Bifidobacteria against colon cancer cells is still being explored.

As a member of the microbiology expert committee, Malaysia's Ministry of Health (MOH) and Southeast Asia Probiotics Scientific and Regulatory Experts Network (SREN), it gave me an opportunity to be involved in the approval and drafting of a policy on the safety issue in probiotic applications both locally and in the Southeast Asia Region.

Further exploration of optimisation studies currently involves the biodegradation of pollutants by Antarctic isolates. As part of the Antarctic team, I joined Universiti Putra Malaysia (UPM) to study the optimisation of biodegradation factors to improve the efficiency of Arthrobacter and Rhodococcus strains cold-adapted to Antarctic isolates that degrade phenol, diesel, and waste cooking oil. The efficiency of biodegradation of pollutants Antarctic improved by optimising the degradation factors such as salinity, ammonium sulphate concentration, sodium chloride concentration, pH and temperature, etc. Until now, active research has been conducted on optimising biodegradation factors of various pollutants by isolated and identified cold-adapted Antarctic strains. Other researchers involved in the Antarctic team are Shibaura Institute of Technology (Japan), the British Antarctic Survey (UK), and Universidad de Magallanes (Chile).



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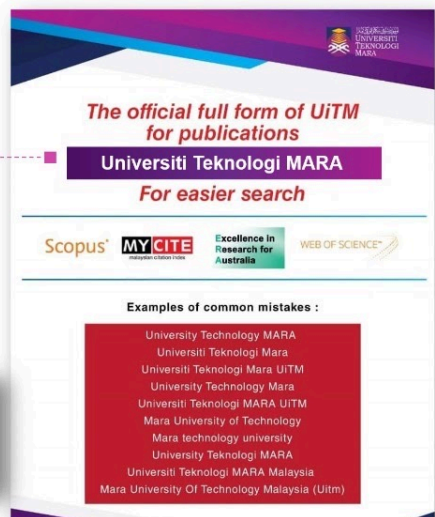
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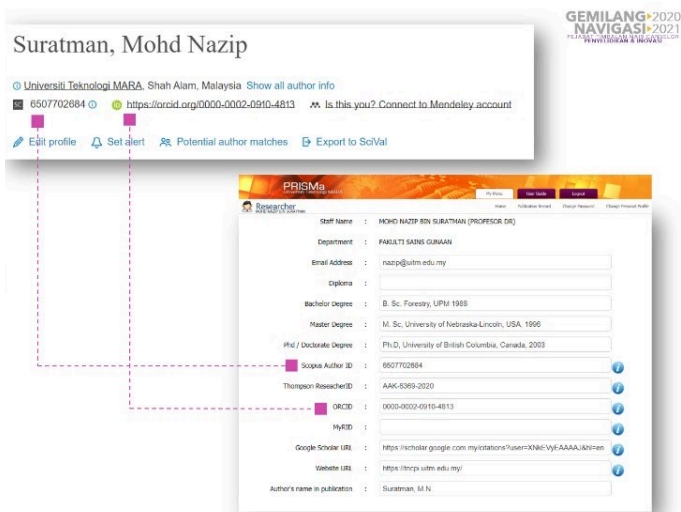
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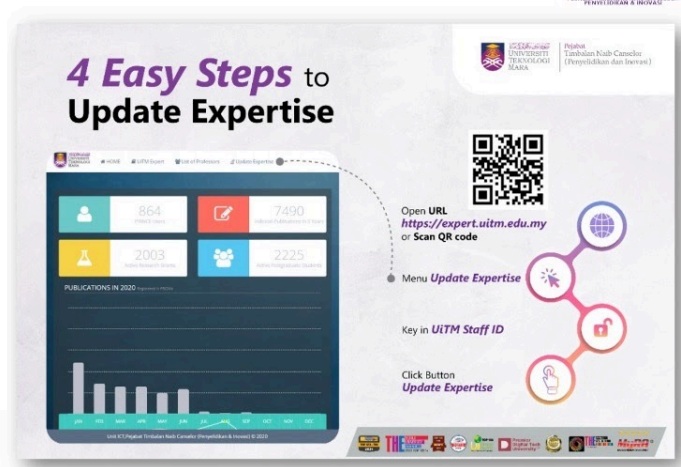
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