



UNIVERSITI
TEKNOLOGI
MARA

Issue #2 | October 2022

RISE

Catalysing Global Research Excellence

Go Green for Our Future
Innovation, Transformation &
Sustainability

eISSN 2805-5683



9 772805 568009

**Unleashing Potentials
Shaping the Future**



RISE

Phone: 603-5544 2004 | E-mail: tncpi@uitm.edu.my | Web: <https://tncpi.uitm.edu.my/>
Facebook: [tncpi.uitm](https://www.facebook.com/tncpi.uitm) | Youtube: TNCPI UiTM
Instagram: [tncpi_uitm](https://www.instagram.com/tncpi_uitm) | Twitter: [tncpi_uitm](https://twitter.com/tncpi_uitm)

ADMINISTRATION

Prof. Ts. Dr Norazah Abd Rahman
Deputy Vice-Chancellor (Research & Innovation)
Office of Deputy Vice-Chancellor (Research & Innovation)
noraz695@uitm.edu.my
603 – 5544 2004

Assoc. Prof. Dr Mohd Muzamir Mahat
Head of Research Communication & Visibility Unit (UKPV)
mmuzamir@uitm.edu.my
603 – 5544 3097

ABOUT THE MAGAZINE

RISE Magazine is published by Office of the Deputy Vice-Chancellor (Research and Innovation) with aims to highlight a research and innovation on multidisciplinary expert of 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 stride to elevate Universiti Teknologi MARA to global standards. This is an effort to promote research as a culture that is accepted by all expertise.

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 and Innovation) or known as TNCPI (*Timbalan Naib Canselor (Penyelidikan dan Inovasi)*) serves as a *Pusat Tanggungjawab* (PTJ) navigate the research and innovation of university in achieving UiTM agenda. TNCPI office strives to mobilize faculty, and campuses to move together and cooperation of researchers to become a leading global university of science, technology, and innovation by 2025.

EDITORIAL TEAM

Patron

Prof. Ts. Dr Norazah Abd Rahman

Deputy Vice-Chancellor (Research & Innovation)

Chief Editor

Assoc. Prof. Dr Mohd Muzamir Mahat

Head of Research Communication & Visibility Unit

Editors

ChM. Dr Shahrul Nizam Ahmad – Guest Editor

Dr Diyana Sulaiman – Guest Editor

Nur Syazwani Ahamad Azahari – (Statistic & Information)

Nazarul Wirda Baharuddin – (Content)

Designers

Muhammad Ammar Khaizuan

Mohd Aizuddin Borhan Shah

Photographer

Muhammad Ammar Khaizuan

Videographer

Mohd Aizuddin Borhan Shah



FOREWORD

Bismillahirrahmanirrahim.

Alhamdulillah, all praises to Allah SWT and a heartfelt congratulations to the Office of Deputy Vice-Chancellor (Research and Innovation) on the publication of RISE Magazine (October Issue, No. 2) in promoting visibility for UiTM's research and its researchers.

I am thrilled to have witnessed a growing number of article publications and research innovations endeavoured by our fellow researchers. Thank you for all the effort, time, and energy that you have selflessly spent for the university.

The sustainability theme chosen for this edition is wise, apt, and timely. While striving to become a Globally Renowned University (GRU) and attaining Sustainable Development Goals (SDGs), we must ensure that our research activities are in line with the 17 goals set by the United Nations (UN) as well as the university's strategic plan.

UiTM is proud with the progressive development of renewable energy and currently 7 campuses are equipped with solar photovoltaic rooftops. This supports Malaysia's noble cause of becoming a carbon-neutral nation by 2050. Green Retrofit Framework for Sustainable Residential Refurbishment Project was also initiated with

plausible effectiveness to increase the number of green buildings and eventually will help reduce the emission of Green House Gases (GHG).

Our researchers have also begun to use Green Polysaccharides material for wound healing which is greener and environmentally benign. Other noteworthy projects are the use of Resistograph to assess the accuracy of Wood Density (WD) prediction, the application of 3D printing technology in simulating real experiences of halal animal slaughtering, as well as lipid reduction via systematic screening to make our planet more sustainable.

I am delighted with the research ambience that has now become an acceptable culture in UiTM. GRU2025 is definitely achievable with continuous effort and dedication made by members of UiTM as we work towards helping the nation and the world to achieving SDGs by 2030.

Thank you.

PROFESSOR DATUK TS. DR HAJAH ROZIAH MOHD JANOR
Vice-Chancellor
Universiti Teknologi MARA



FOREWORD

Congratulations to the editorial team on the publication of RISE magazine Issue 2, 2022, serving as a platform to showcase our pride in UiTM research and innovations.

We chose *Sustainability* as the theme for this edition. Despite its definition that may be contextual and vary across the field, we can't deny its essence and impacts on our daily life, and that every one of us should gracefully embrace.

Under this umbrella, we have witnessed an array of projects carried out by UiTM researches in various genres of research, driven to help the community in the short and long run. Flipping each page of this magazine and seeing how far we have become as a university sends unflagging goosebumps- signaling how proud I am to be part of this huge family.

Research has no longer been alien to us. We could see that the propagated activities in the quest of finding answers to problems have mushroomed over the years. It has become somewhat the bread and butter of academics other than teaching and learning. Its role has been significantly proven to elevate teaching community to a better level.

TNCPI Office seeks continuous support from every researcher, academician, and administrator to keep your momentum in doing research and innovations. Perhaps, through a stronger research ecosystem, this will help us to become a Globally Renowned University by 2025. We will keep providing supports, rewards and facilities needed in boosting the morale of our researchers.

Lastly, I hope RISE can be the front page of UiTM exhibiting the business that we are doing. Every time you go for a conference or any meeting with potential collaborators, please share RISE with them. We never know how much opportunities that will come knocking our doors just from that gesture.

Thank You.

PROFESSOR TS. DR NORAZAH ABD RAHMAN

Deputy Vice-Chancellor (Research & Innovation)
Universiti Teknologi MARA

MESSAGE FROM THE CHIEF EDITOR

Alhamdulillah

It gives me great pleasure to see RISE issue # II published. We have received a huge number of impactful submissions to be featured as our #KeluargaUiTM's research stories. Despite the difficult circumstances of post-covid19, 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. Not to forget all editorial members who worked hard to ensure its publication was on schedule. The publication of this issue would have been far more difficult to achieve without their contributions. In this edition, we feature seven researchers from both science and technology and social sciences disciplines with their views and experiences in sustainability-related research and their efforts for mobilising sustainable development. Also, RISE II presents the achievements of the multidisciplinary domains by distinguished UiTM research groups.



I believe that sustainability should be the nucleus of any research agenda. Prominent researchers around the world are focusing on the call to address global livelihood and wellbeing. Hence, we at UiTM should embed and embrace the principles of Sustainable Development Goals in our research efforts.

To all researchers out there, we hope that the amazing stories in RISE II will rekindle our enthusiasm for research. We sincerely hope to bring you more research news from the #keluargaUiTM in the coming issues. I invite you to discover RISE II and be inspired. Enjoy reading!

ASSOC. PROF. DR MOHD MUZAMIR MAHAT

Head of Research Communication & Visibility Unit (UKPV)
Office of Deputy Vice-Chancellor (Research & Innovation)



ChM. Dr Shahrul Nizam Ahmad
Guest Editor



Dr Diyana Sulaiman
Guest Editor



Nur Syazwani Ahamad Azahari
Statistic & Information



Muhammad Ammar Khaizuan
Designer & Photographer



Mohd Aizuddin Borhan Shah
Designer & Videographer



Nazarul Wirda Baharuddin
Content

CONTENTS

- 04 Tree Wood Density Assessment using Micro Drilling Device, Resistograph for Sustainable Forest Management Operation
- 06 Clinical Clerkships for Final Year Pharmacy Students are Possible during the COVID-19 Pandemic!!
- 08 Embracing Sustainability via Academic Endeavours
- 15 The Challenge of Sustaining Improvements in Patient Medication Adherence
- 17 Energy Justice in Rural Electrification: A Case Study of Rumah Panjang Tungan Batang Rajang, Kapit Sarawak
- 19 Stakeholders Site-level Workshop for Project Ecosystem Service Assessment in The Central Forest Spine (CFS) Selangor using Toolkit for Ecosystem Service Site-based Assessment (TESSA)
- 24 Achieving A Sustainable Lipid Reduction Via Systematic Screening
- 26 Humanitarian Crises: The Role of Islamic Finance
- 28 Achieving Business Sustainability through Green Innovation
- 33 Empowering *Halal* Research Towards Sustainability Through Disruptive Technology
- 35 Unsafe Disposal of Used Face Masks and Endangerment to Our Planet
- 37 Green Polysaccharides for Wound Healing
- 42 SUSTAINABILITY 101 FOR CHILDREN



- 44 Green Retrofit Framework for Sustainable Residential Refurbishment Project
- 50 Issue and Challenges of Completing an International Research Grant: *A reflection of the project on Food Security and Sustainability*
- 52 Sustainability: The Three Pillars
- 54 International Sustainability Invention, Innovation and Design Showcase (ISIIDS 2022)

A minute with researcher...

- 02 **Prof. Dr Yarina Ahmad**
*Institute for Biodiversity & Sustainable Development (IBSD)
Faculty of Administrative Science & Policy Studies*
- 12 **Prof. Ts. Dr Mohd Nazip Suratman**
*Professor of Forestry at the Faculty of Applied Science
Associate Fellow at the Institute of Biodiversity and Sustainable Development
Universiti Teknologi MARA*
- 22 **Assoc. Prof. Dr Mohd Hafiz Hanafiah**
*Institute for Biodiversity & Sustainable Development (IBSD)
Faculty of Hotel & Tourism Management*
- 31 **Prof. Dato' Dr Mohd Zaki Salleh**
*Director
Integrative Pharmacogenomics Institute (iPROMISE)
Universiti Teknologi MARA*
- 40 **Prof. Sr Dr Zulkiflee Abdul Latif**
*Director, Institute for Biodiversity and Sustainable Development (IBSD)
Universiti Teknologi MARA*
- 48 **Assoc. Prof. Ir Dr Nofri Yenita Dahlan**
*Director, Solar Research Institute (SRI)
College of Engineering
Universiti Teknologi MARA*
- 56 **Prof. Datin Dr Hapizah Md Nawawi**
*Founding Director and Principal Fellow, Institute of Pathology, Laboratory and Forensic Medicine (I-PPerForM)
Professor and Senior Consultant in Chemical Pathology and Metabolic Medicine, Faculty of Medicine
Universiti Teknologi MARA*





Scan to
Official Facebook



A Product by UiTM



UNIVERSITI
TEKNOLOGI
MARA

Fakulti
Sains Gunaan
BITCOM

FAVFOOD
INDUSTRIES



COPYRIGHT: CRLY00015409



Your Energy Coffee

**HIGH WHEY PROTEIN | VITAMIN B's |
NANO SUGAR | LOW CAFFEINE**



unacoffee_offical



unacoffee offical



unacoffee_offical

www.favfood.com.my



Scan to
Official Facebook

Tree Wood Density Assessment using Micro Drilling Device, Resistograph for Sustainable Forest Management Operation



Ts. Jacqueline Joseph

*Faculty of Plantation and Agrotechnology,
(UiTM Sabah, Kota Kinabalu Campus)*

Wood density (WD) is one of the crucial predictor variables aside from tree diameter and height, which serves to quantify the forest above-ground biomass (AGB) and carbon stocks. Hence, carbon stocks reports require robust data and transparent information on WD to be provided to United Nations Framework Convention on Climate Change (UNFCCC). Notably, acquiring *in-situ* field WD of live trees could be significantly challenging and arduous. Due to this, a non-destructive tool (NDT) is indispensable to predict the WD of trees without jeopardizing the tree itself. Therefore, resistance micro-drilling is seen as a promising non-destructive tool (NDT), provided by its broad application in forestry to the extent of WD assessment. Forest AGB estimation is the most practical approach adopted in Reducing Emissions from Deforestation, and Forest Degradation, and Enhancing Carbon Stocks (REDD+) and is regularly quantified using tree allometric equations. Three variables frequently used in equations namely tree diameter, height, and wood specific gravity (WSG), also known as wood density. Amongst the two variables, WSG is perceived as an ideal predictor variable to estimate biomass. In light of the breakthrough of micro resistance drilling on various scientific studies relating to WD assessment on living trees, resistance micro-drilling is proven to exhibit a strong positive correlation with WD value. In addition, the density of wood species is needed to convert data on wood volume to biomass. It has made WD an essential variable for quantifying woody biomass and carbon stocks accurately. Ignoring variations in WD could result in poor overall prediction of the stand AGB. Therefore, it is crucial to acquire WD data that is feasible for extensive analysis and could be accomplished in conservation and protected areas. As WD data is needed to improve the allometry, various tools have been used and explored to obtain WD in standing trees without sacrificing excessive energy and costs.

The ability of the resistance micro-drilling to assess the accuracy of WD prediction without performing strenuous laboratory works has given an advantage in yielding rapid predicted WD values and developing



AGB allometric models. A shaft diameter of 1.5 mm and a 3-mm-wide tip of resistance drill has enabled penetration into the wood without causing severe injury to the tree. The hole is barely found, making this tool ideal for non-destructive WD assessment in standing trees. The WD values could be calculated by converting drill resistance values into drill density values via a linear equation.

Resistance micro-drilling has been seen as a potential alternative to acquire WD's predicted value in standing trees. Its importance is in evidence with a significant amount of research conducted to explore WD assessment using resistance micro-drilling for various applications such as timber structural analysis, tree health assessment, tree breeding and ages investigation. It has working mechanism where the torque (rotating force) will be electronically measured as a small needle is driven into a tree with constant energy. The power being consumed and absorbed during the drilling will reveal the WD variation. The drill resistance profiles will appear as a succession of peaks and valleys corresponding to the degree of wood penetrability by the resistance drill. The reliability of resistance micro-drilling as a tool to provide indirect predicted WD value lies on the following factors;

- Drilling profiles processing
- Resistograph potential variables for predictive model development
- Condition of drill bits
- Drilling depth and direction
- Presence of abundant extractives in the tree (sap, resin)



Drilling in linear path to annual rings is highly favoured as it will retain the drilling angle from being 90° distorted and obtain a clear succession of peaks and troughs in the profiles. In addition, the density variability is most significant in the radial direction.



High resolution drilling profiles will deliver valuable density information and can be reliably interpreted. Therefore, drilling in radial direction from bark to pith could improve prediction on WD value, and researchers should study this approach thoroughly in future research. In addition, the instability of the drilling to be retained in radial direction will lead to poor interpretation on resistogram profile and may affect the accuracy of WD prediction. Resistance micro-drilling might require device configuration to maintain stability while drilling in a linear path. The general notion is that more potential methods could be explored and found regarding improving Resistogram profiles. It is imperative that researchers should undertake rigorous WD assessment using micro-drilling in the future. Integrating potential variables such as geo-climatic factors to be fitted in linear regression analysis could generate various possible validation models, leading to the acquisition of the best predicted WD. Sound analyses of the drilling resistance profile demand in-depth theoretical knowledge in tree anatomy from experts, including the arborist and dendrologist. Well-interpretation of the drilling profiles will provide sufficient information on the WD of the tree itself as well as the tree health condition.

Hence, this study asserts that the application of Resistograph requires both skills in handling the device in the field and, at the same time, must be knowledgeable on interpreting the resistance profiles. It would be intriguing to evaluate the potentiality and performance of Resistograph to assess *in-situ* WD on live trees with different species, ages, density, sampling location and diameter classes. Researchers have the opportunity to evaluate the tool's endurance in assessing the WD of large groups of standing trees to estimate the AGB and carbon stock accurately in tropical forests. Rapid assessment on WD using micro resistance drilling will provide critical information for the forest managers to facilitate decision-making on forest management activities. Screening and selecting ideal species regarding their density can be carried out seamlessly using the predicted WD value from the resistance micro drillings variables for forest restoration, harvesting and tree breeding programs. In short, this is a plausible justification to assist the REDD+ mechanism in conserving the existing forest carbon stocks and sustainable forest management.



ROBOPRENEUR
EMPOWERING INNOVATION



Empowering Innovation
for a **Better Humanity**

www.robopreneur.com



Scan for
more details

SMART DATA LOGGER FOR PH-CP REMOTE MONITORING SYSTEM



Scan for more details

SAGA INTERNET OF THINGS (IOT) GATEWAY SYSTEM



IOT in Agriculture



IOT in Aquaculture



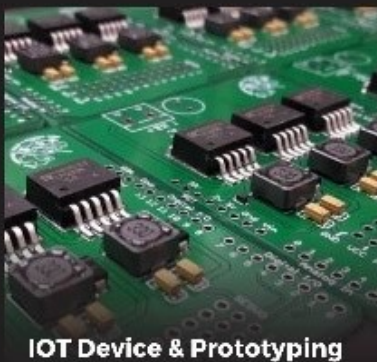
IOT in Safety & Health



IOT in Sports



IOT in Energy Monitoring



IOT Device & Prototyping



IOT Training



Scan for more details

BIODEGRADABLE

RM Polypack Sdn Bhd

Manufacturing and trading all kinds of polymer and green products.

CEO: PM TS DR. RAHMAH MOHAMED

BIOBAG /
BIOSTRAW /
DEGRADABLE
BOTLES



bitcom.uitm.edu.my



Bitcom Uitm



bitcom_uitm



bitcomuitm



Scan to
Official Facebook





*Tropical Taste
In Every Dish*

Scan to
Official Facebook



NITIDENT TUAH DENTAL IMPLANT SYSTEM



Scan for more details

HIGH FLEXION KNEE IMPLANT



UNIVERSITI
TEKNOLOGI
MARA



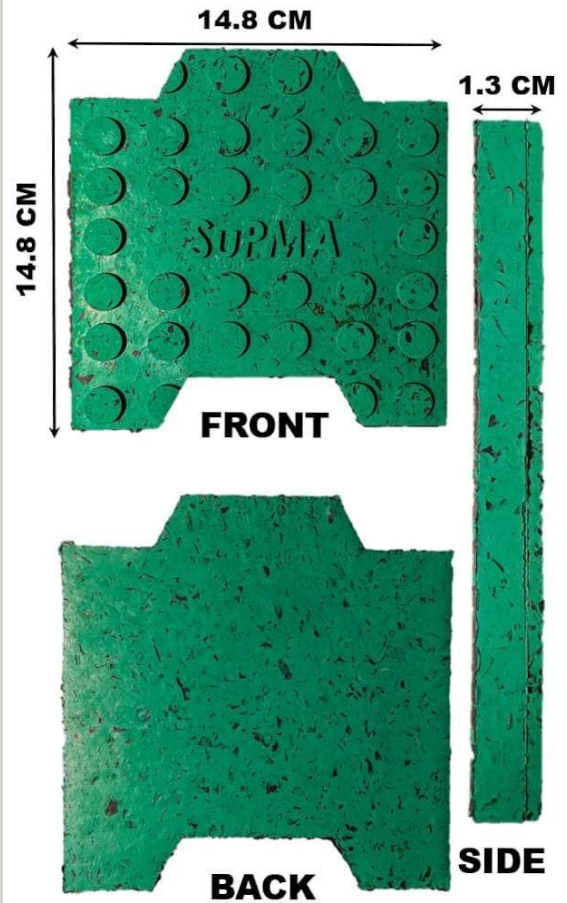
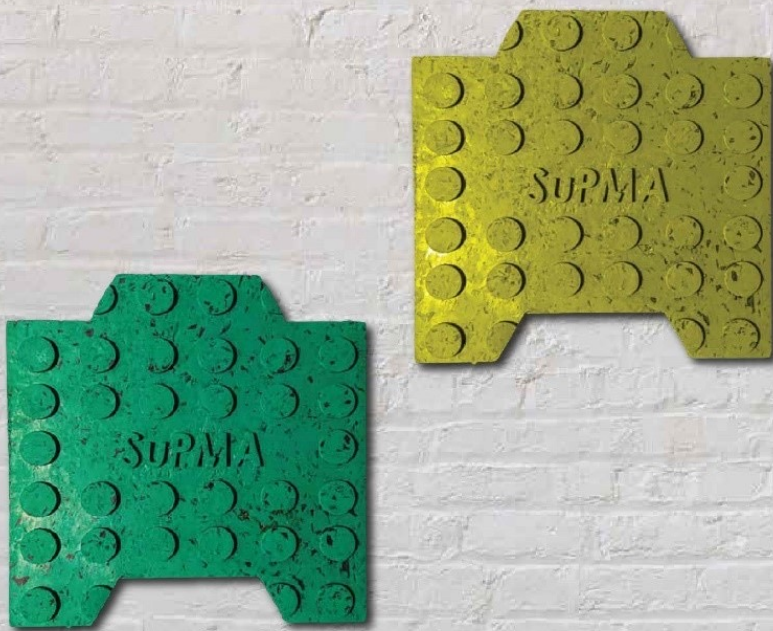
3D GENS



Scan for more details

HEALO: Heat Healable Rubber Tile

Heat Healable Rubber Tile



Scan for more details

HAND SANITIZER SHIELD +



Scan for more details

G95 FACE SHIELD



Scan for more details



UNIVERSITI
TEKNOLOGI
MARA

Fakulti
Sains Gunaan

BITCOM
BUSINESS INNOVATION & TECHNOLOGY COMMERCIALIZATION CENTRE

*Your Scents
Enterprise*

COPYRIGHT NOT NO: CRLY00023422
TRADE SECRET APPLIES



DR AZRI'S PERFUME [HQ]



DR AZRI'S PERFUME



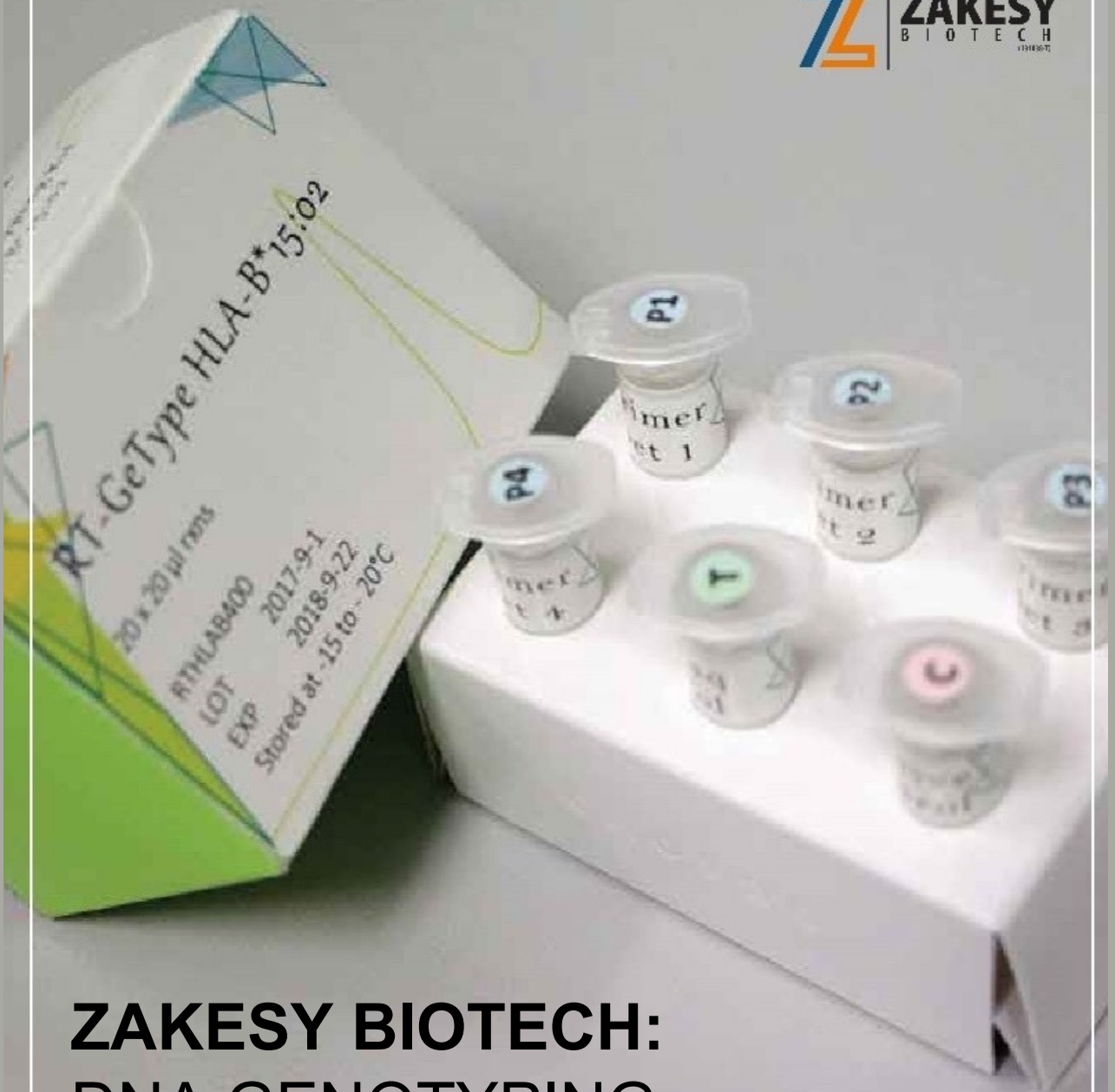
DRAZRISPERFUME



+60138836684



**Scan to
Official Facebook**



ZAKESY BIOTECH: DNA GENOTYPING



Scan for
more details



RISE

Catalysing Global Research Excellence

Copyright and Disclaimer

RISE Magazine is owned and published by the Office of the Deputy Vice-Chancellor (Research & Innovation), Universiti Teknologi MARA. This magazine is for informational purposes only. The information is true and accurate at the time of publication.

No person, organisation or party can copy or re-produce the content in the magazine or any part of this publication without a written consent from the editors' panel and the author of the content, as applicable. The publisher, authors and contributors reserve their rights with regards to copyright of their work. The copyright includes (and not limited to) the content and/or images used in any of the articles of this publication.

The content in the RISE magazine is made available on the terms and condition that the publisher, editors, contributors and related parties: shall have no responsibility for any action or omission by any other contributor, editor or related party; and are not responsible in any way for the actions or results taken by any person, organisation or any party on basis of reading information, or contributions in this publication.

©2021. Office of Deputy Vice-Chancellor (Research & Innovation), Universiti Teknologi MARA (UiTM), Shah Alam 40450, Selangor, MALAYSIA.