Issue #2 | October 2022

UNIVERSITI TEKNOLOGI MARA

# RISE

*Catalysing Global Research Excellence*

## Go Green for Our Future
## Innovation, Transformation & Sustainability

eISSN 2805-5683

*Unleashing Potentials Shaping the Future*

UNIVERSITI TEKNOLOGI MARA

# RISE

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## 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

# FOREWORD

*Bismillahirahmanirrahim*.

*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 well 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**
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OCTOBER 2022


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Ocean Mist
Hand Sanitizer
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Hand Sanitizer
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Bouquet
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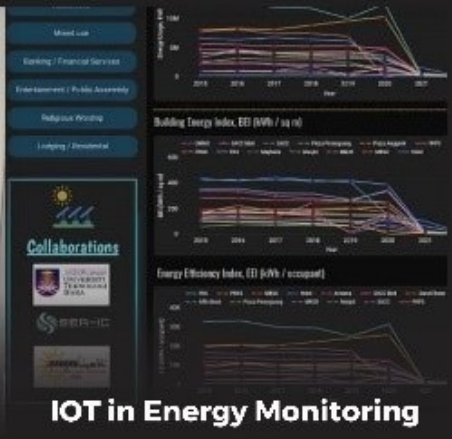
IOT in Agriculture

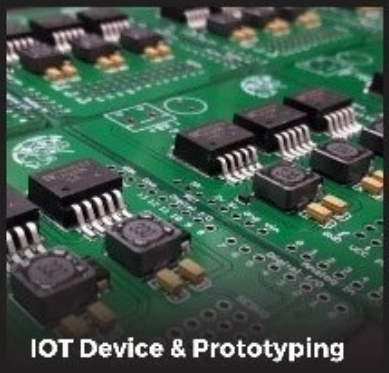

IOT in Aquaculture


IOT in Safety & Health


IOT in Sports



IOT in Energy Monitoring


IOT Device & Prototyping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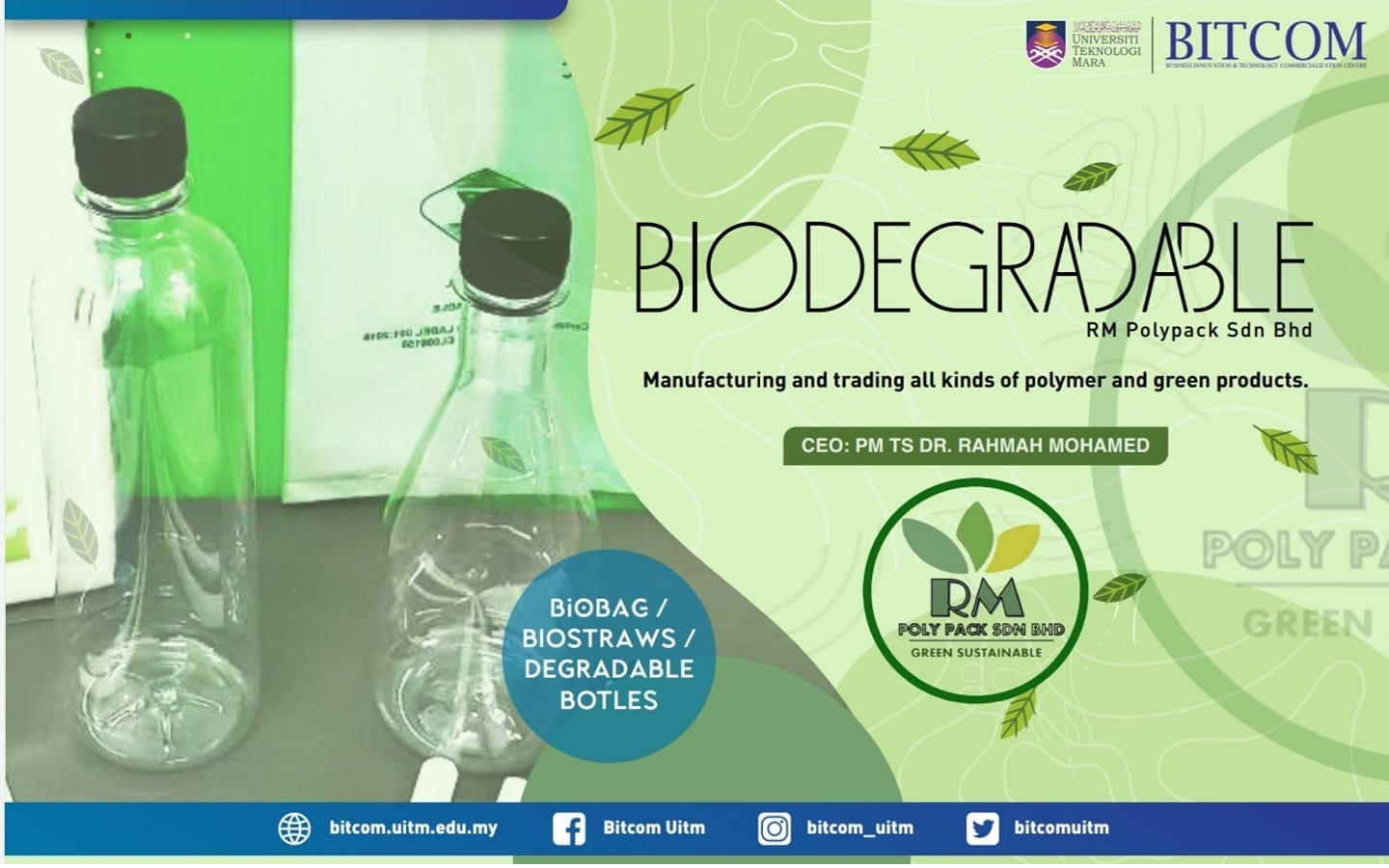


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# Unsafe Disposal of Used Face Masks and Endangerment to Our Planet

**Nurul Najihah Mad Rosni**
*College of Engineering,*
*UiTM Sarawak*

The outbreak of the COVID-19 virus has been declared as worldwide pandemic by the World Health Organization (WHO) on March 2020. The spread of COVID-19 virus caused severe threats to humanity and posed threats to our economic and social life. To curb the spread of COVID-19 disease, WHO has released a guidelines as precautionary measures which includes travel restrictions, social distancing, and total and partial lockdown of cities, among others.

## The needs for face mask

The use of face masks was also made compulsory especially in crowded places to suppress transmission of virus and to save lives. Wearing a face mask is not only to protect ourselves but also the others. As a result, the global face mask production has increased significantly due to increased needs. Millions of face masks have been produced, used and discarded daily. The face mask acts as a filter, shielding the user from inhalation exposure to airborne viruses, particles, and other contaminants. It helps to prevent the spread of infectious diseases [1]. However, the disposal of the used face masks were often not in the manner that is environmentally friendly. Since the outbreak of COVID-19, there has been a substantial increase in the number of discarded face masks on the streets, beaches, gutters, and in public places. Discarded masks will eventually end up in the ocean, ruining the ecosystem and posing a threat to marine life. The improper disposal of face masks could led to environmental disasters.

## Material to produce face ask

Face masks are made from non-biodegradable materials, and they will likely cause environmental problems in the future. Face masks typically have three layers: an outside layer made of non-woven fibers, a middle layer made of a melt-blown filter, and an inner layer made of soft fibers [2]. These face masks are composed of plastics such as polypropylene, polyurethane, polyacrylonitrile, polystyrene, polycarbonate, polyethylene and polyethylene terephthalate [3]. The synthesis of polymers from petrochemical by-products release a large amounts of greenhouse and hazardous gases [1]. This shows that the current outbreak is generating pollutants in the environment causing negative impacts on humans and living beings. Hence, effective solutions are required to reduce the unwanted environmental impacts to enable us to continue using face masks as our protection against COVID-19 virus.

## What can be done?

Reduction of face masks usage during the pandemic/endemic will be highly unlikely as it helps to reduce the level of transmission of COVID-19 virus and protect the most vulnerable individuals from COVID-19. Therefore, to control the waste generated from the disposal of face masks, plans and management approaches should be executed as follows:

1. The use of cloth face masks could be a potential substitute for medical mask as the latter are mainly made using non-degradable materials. Cloth face masks are made from biodegradable materials and provide personal comfort as well as adequate protection. The fabric should be made from absorbent materials as the moisture needs to be blocked to protect the skin, mouth and nose. In fact, a cloth face masks can be cleaned, disinfected and reused [1].

2. Awareness campaigns are needed to raise public's understanding on how to use and dispose of face masks safely. These can be conducted via social media, posters, billboards, advertising on television, and others. A short video to raise people's awareness on how to use and dispose of face masks can also be shown on screens [4].

3. Disposal of the face mask in the right place will prevent problems like spreading of virus and mask littering. A special bin for clinical waste should be placed in public areas to separate discarded face masks from other type of waste.

4. Government should establish policy and regulation on the usage and environmentally safe practice for the disposal of face masks to assure public health safety without compromising the environment [4]. On this note, the government can conduct awareness programs, enforce existing rules and establish standard guidelines on the use and environmentally safe practice of disposal of face masks. Besides, the government should also impose a strict fine on those who violates regulations and discarded face masks indiscriminately.

The success of the above-mentioned approaches can be achieved with the involvement of government institutions to minimize the impact of discarded face masks to the environment. It will be a great challenge for the government to independently execute those plans. All of us play an important role to prevent the face masks from harming our planet by limiting unsafe release of the used face masks into the environment.

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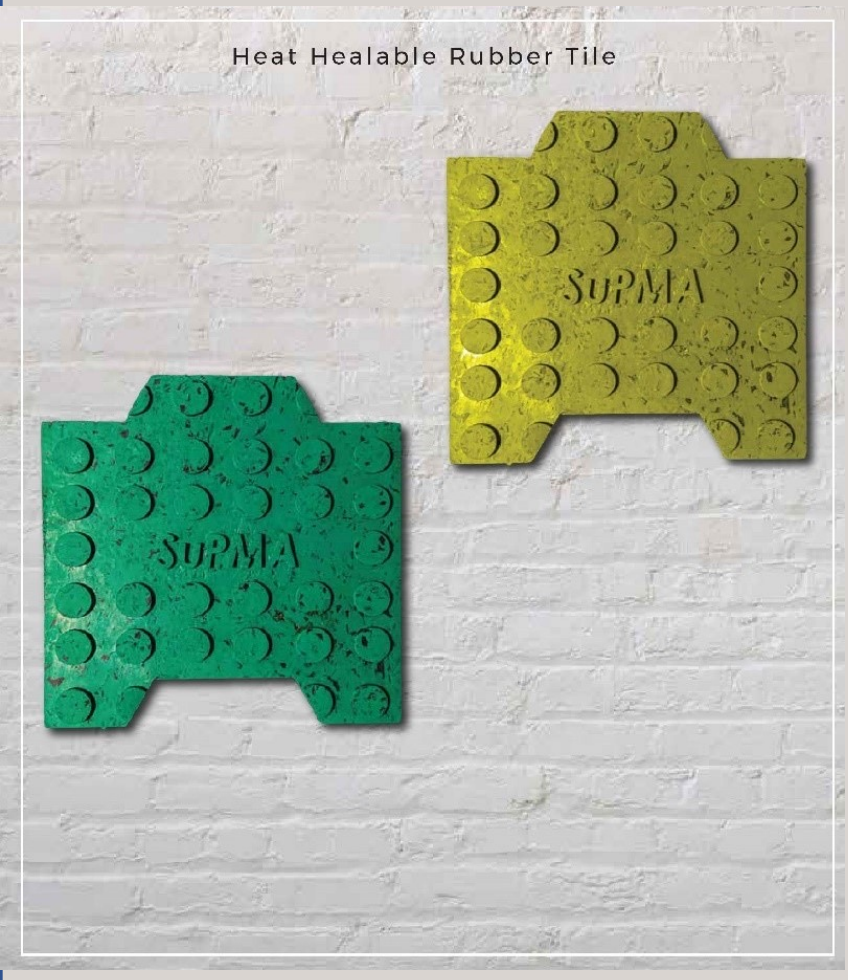


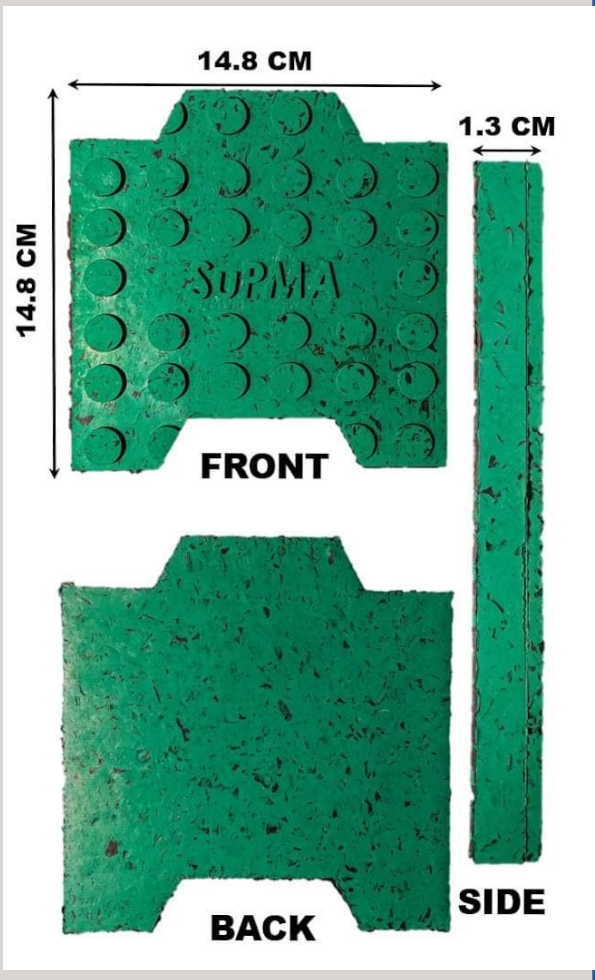


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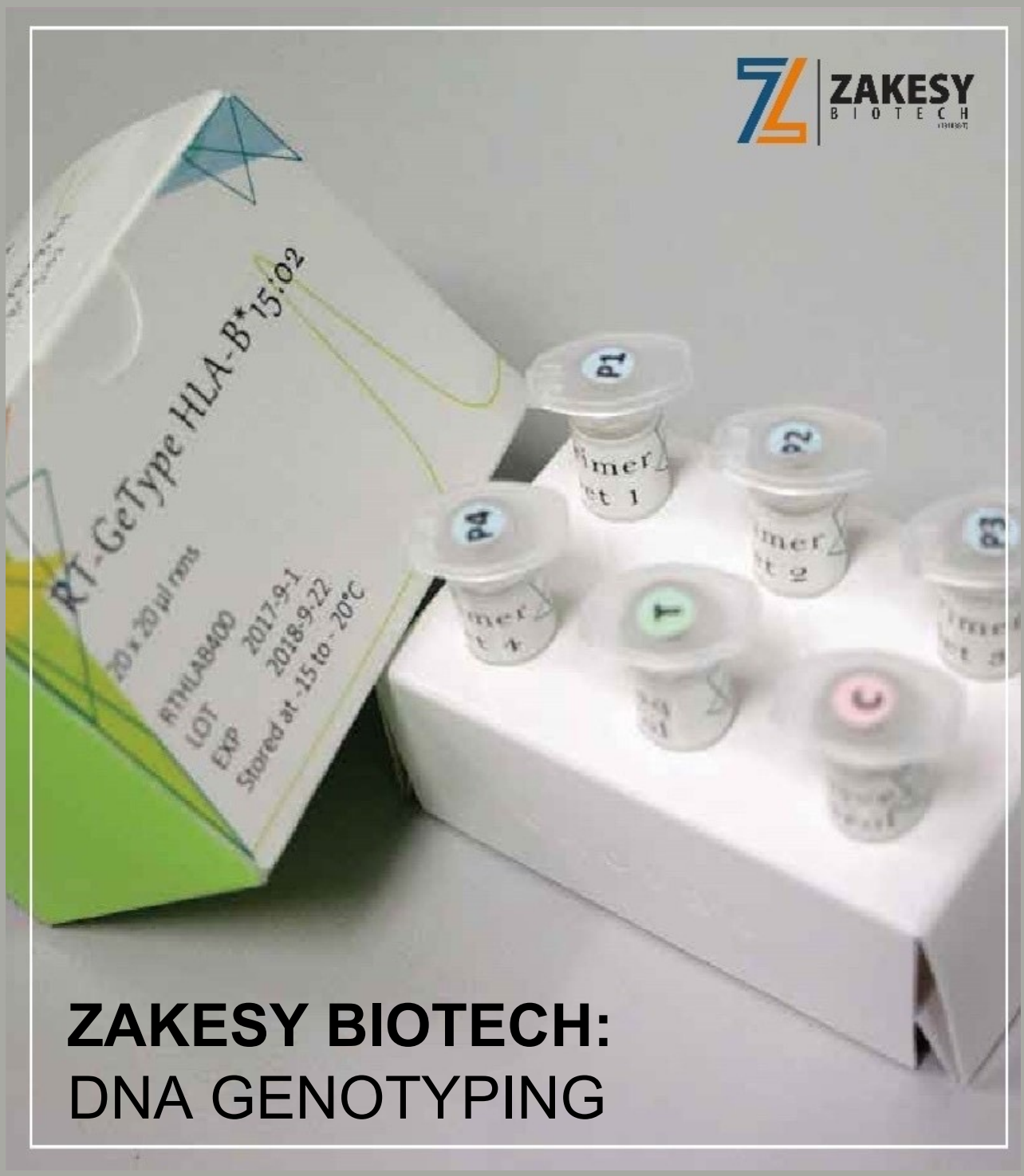


# ZAKESY BIOTECH:
# DNA GENOTYPING

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