

'Scientists can wear make-up'

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STILL bewildered about her future and with a vague ambition in mind at 17, Dr Magaret Sivapragasam never thought winning a writing competition organised by the Tiger Woods Foundation and Coca-Cola would be the starting point of her journey to inspire young minds.

Believing that it was the power of words that had helped her to win the competition, Magaret said: "Words have the power to change a nation, and we should use that power to help enrich, educate and add value to life."

Magaret was recently appointed as one of the International Union of Pure and Applied Chemistry (IUPAC) Periodic Table of Younger Chemists, in honour of a diverse group of 118 outstanding individuals from around the world.

These chemists will embody the mission and core values of IUPAC until July 2019.

IUPAC is the world authority on chemical nomenclature and terminology, including the naming of new elements in the periodic table; on standardised methods for measurement; and on atomic weights, and many other critically evaluated data.

Still in disbelief at receiving such an honour from IUPAC, Magaret is happy to be able to put Universiti Teknologi Petronas (UTP), where she is a postdoctoral research scientist, and Malaysia on such a distinguished platform.

Each of the selected scientists represents a different element. Magaret represents ytterbium (Yb), the chemical element with the atomic number 70 on the periodic table.

"I broke out in goosebumps when I saw the Malaysian flag on the Periodic Table of Younger Chemists for the first time."

The selection criteria are based on several key areas including working on scientific topics relevant to the United Nations Sustainable Development Goals.

Other criteria include increasing public appreciation and understanding of chemistry, fostering diversity in the chemical enterprise, improving chemistry and science education for students, and advancing interdisciplinary and international collaboration in chemistry research.

Magaret was recognised for her research into Ionic Liquids (ILs), alternative green solvents for water pollutant control. The liquids have replaced conventional solvents in many areas of science such as biotechnology, pharmaceuticals, medicine and agriculture.

"I am in the midst of setting up a larger ecotoxicity laboratory at UTP which will comprise all test batteries for ecotoxicity studies."

"One of my projects includes the removal of dye substances — used in the batik dyeing industry — from industrial wastewater."

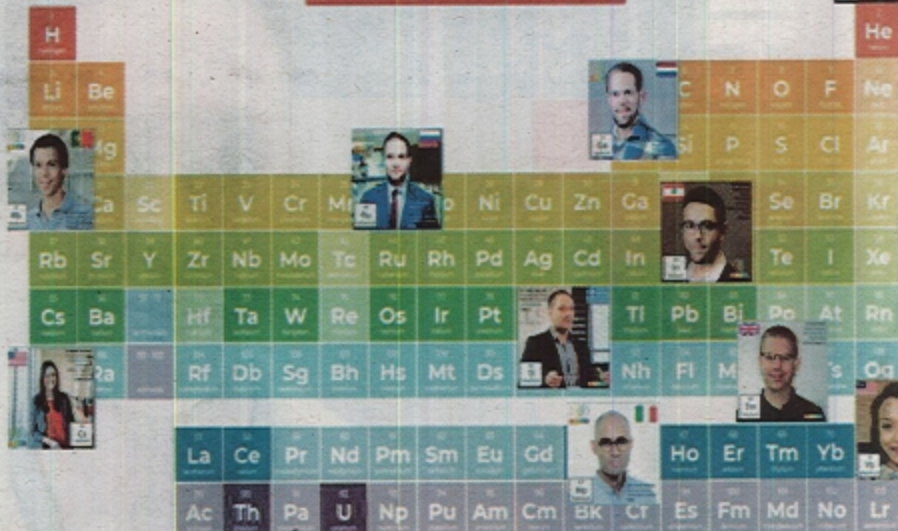
"My team and I worked hard on designing a completely green biodegradable IL to absorb dye pigments. This was a group effort from chemically designing the molecules, optimising and testing them in the ecosystem."

"As ILs are highly insoluble in water, their release into the sea and rivers may damage aquatic organisms and the ecosystem. ILs are also resistant to photodegradation, making them a threat to aquatic organisms."

"For these reasons, proactive actions have been taken in evaluating the ecotoxicity of ILs. I am glad to be a part of a greater purpose and thoroughly enjoy the work I am doing."

Periodic Table of Younger Chemists

REVEAL ALL THE FACES OF THE PERIODIC TABLE



Magaret Sivapragasam (bottom right) was chosen to represent ytterbium (Yb). Each of the selected scientists represents a different element in the Periodic Table of Younger Chemists. PICTURE COURTESY OF INTERNATIONAL YOUNGER CHEMISTS NETWORK'S TWITTER @INTLYOUNGERCHEM

added Magaret.

For the innovation, Magaret has won two prizes, which include Stage 2 of the Shell Ideas 360 Innovators Challenge and Honourable Mention at the Yale University Green Chemistry Challenge.

"I do not take sole credit for this as scientific accomplishments are always an amalgamation of team members who work towards a common goal."

SCIENTIFIC JOURNEY

Magaret graduated with a Degree in Biotechnology (Honours) from the Asian Institute of Medicine, Science and Technology in 2008.

For someone who was still uncertain of a career path, biotechnology proved to be a perfect match for her.

Magaret said biotechnology has a sheer diversity of applications. It deals with the study of flora and fauna, genetics, pharmaceuticals and medicine.

"Simply put, biotechnology is the application of advances made in the biological sciences. Over the years, biotechnology has helped improve food quality, quantity and processing, and many other applications. Biotechnology research is often times interdisciplinary; one works in teams comprising chemists, molecular biologists, statisticians, engineers and clinicians."

"I find this very rewarding as I get to learn from so many others along the way."

"I learnt about plants, animals, microorganisms and pharmaceuticals from some of the best in the field. It was a perfect blend of everything."

At university, she interned at Veterinary Research Institute Malaysia where she joined a team to develop vaccines for the Newcastle Disease Virus.

"I went on to pursue a doctoral degree in bioprocess engineering at Universiti Putra Malaysia (UPM). I was attached to the Department of Chemical and Environmental Engineering under the supervision of Associate Professor Dr Norhafizah Abdullah and co-supervision of Professor Raha Abdul Rahim."

"There I worked on the separation of recombinant protein using chromatographic techniques. My postgraduate course honed my abil-

Magaret Sivapragasam celebrating International Women's Day with participants at the Asian Institute of Medicine, Science and Technology on March 22.



ity to write manuscripts. It was in UPM that I was exposed to the real world of science."

Upon completing her postgraduate doctoral degree course with distinction, she joined the Centre of Research in Ionic Liquids (CORIL) under the wing of UTP in 2015.

"At the research centre, I focused on chemistry as its core and found myself to be inferior to my colleagues. It was a struggle. Burning the midnight oil became my favourite pastime."

"However, I was pleasantly surprised at the increase in my knowledge and interest."

For the past year at CORIL, she has been working on the compatibility of biomolecules such as DNA, protein and lipids to ILs.

In 2017, she was awarded the prestigious Science Finder Chemical Abstract Service (CAS) Future Leader by the American Chemical Society (ACS).

Magaret was recently featured on Science and She, a social media campaign initiated by the International Service for the Acquisition of Agri-biotech Application and its network of Biotechnology Information Centres worldwide.

She has represented Malaysia as a young scientist in many international conferences, speaking on her research into ILs.

With a passion for science communication, she has published articles in *ACS Axial* and *The Petri Dish*, for example.

Magaret is actively involved in research pertaining to biotechnology such as enzyme technology, biochemistry and downstream purification.

"I specialise in the fields of environmental studies, microbial, microbiology, microbial/synthetic biosurfactants and surfactant-ILs binary mixtures."

"At UTP, I manage the toxicity research laboratory as well as conduct research pertaining to environmental studies."

"Being an advocate of science communication, I organise bi-monthly *Let's Talk Over Tea* sessions for UTP students. These sessions provide a platform for young scientists to share their hobbies and interests in an informal setting."

SOCIAL MEDIA INTERVENTION

In Malaysia, the use of social media platforms as a medium to disseminate scientific information is still scarce.

In December 2017, Magaret was invited by a



Magaret Sivapragasam in the laboratory at the Centre of Research in Ionic Liquids, UTP.

local public university to share her views on science communication and social media.

An active member of ACS, Magaret uses social media such as Twitter and Facebook to talk about science.

She challenges postgraduate students to be bold in communicating science through social media.

An advocate for female scientists, she started the Twitter hashtag movement #scientistcanwearmakeup to encourage them to speak up against gender discrimination.

"I was elated to learn that many female scientists picked up the Twitter handle. Sometimes, the ability to inspire is a win itself."

"People come up to me and say, 'You look as if you belong in the media world or human resources, not science.'"

"In many Asian countries, female scientists are often perceived to appear in a certain way. This includes the way a female scientist dresses and carries herself. The struggle for women in science and especially for women working in male-dominated environments will only change when there are more women in the field and in positions of power within the scientific community."

"As a woman who works in a scientific field, I have had the experience of being taken less seriously when I dressed in feminine attire."

"A woman should have the liberty to dress in a way she wants without being judged. So I started that hashtag in the hope that I can inspire young girls to always be themselves. Let your personality shine, and a little sass never hurts! Ironically, this additional scrutiny makes women better scientists."

"Be proud of your achievements. Sometimes you must put yourself out there to be heard."



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