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In pursuit of knowledge

It takes passion, patience and almost insatiable curiosity to be a molecular biologist, but the rewards of new discoveries are immense.

By **KAREN CHAPMAN**

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TENACITY and passion are important aspects of being a scientist as it often takes years before a discovery or breakthrough is made.

No one perhaps knows this better than Prof Dr Rahmah Mohamed, who is Universiti Kebangsaan Malaysia (UKM) deputy vice-chancellor (Research and Innovation Affairs).

Prof Rahmah led a team of researchers from UKM for the past 15 years who together with counterparts from other regions found a highly potent toxin which holds the key to how bacteria acts and causes the cells of an infected person to die.

Results of the discovery were a collaborative effort by the researchers – which included those from the Malaysia Genome Institute – and a consortium of laboratories in the United Kingdom (UK), including Sheffield University.

It was a well-deserved accolade as the research work was published in the Nov 11, 2011 issue of *Science*, the world's leading and prestigious journal on scientific discovery.

The research team discovered a protein produced by the bacterium *burkholderia pseudomallei*, which proved to be the deadliest among all the toxic proteins of the organism.

Dubbed BPSL1549, the protein could render the bacterium 100 times more lethal than those engineered to stop making the toxin. Their discovery not only shed light on how the bacteria caused disease but may have significant applications in the treatment of other unrelated diseases.

The bacteria *burkholderia pseudomallei* is a free-living bacteria present in the soil, especially mud, and surface water. It causes melioidosis, a disease of high morbidity and mortality whenever it strikes.

It can occur in many forms; ranging from no symptoms of the

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disease to acute and deadly forms. People with high risk conditions such as diabetics are particularly prone to assault by this little-understood pathogen.

"Science is all about opening eyes and expanding horizons," shares Prof Rahmah who is a molecular biologist.

She says her work could ultimately lead to new treatments of patients with melioidosis.

For instance, antibodies that can bind and block the toxic activity of the BPSL1549 could one day prove

to be an effective means of melioidosis treatment instead of using antibiotics. Currently, melioidosis is treatable with only a narrow range of antibiotics and despite that, in South-East Asian countries, the mortality rate can be as high as 40%.

Prof Rahmah has been striving hard to increase research prominence at UKM, and has put in place numerous procedures, policies and facilities aimed primarily at increasing the growth of research and innovation.

As an example, she says the creation of 33 technology start-up companies is a strategy to bring research to the market place and create jobs for entrepreneurial graduates.

Although Prof Rahmah's days are filled with administrative duties as a deputy vice-chancellor as well as a molecular biologist, she likes to relax by gardening and reading murder mysteries.

Her garden is divided into four sections at home – cactus, bougainvillea, herbal and fragrant flowers.

"Gardening takes my mind off things as the care of each garden section is so different," she adds.

Prof Rahmah, who has been with UKM for 30 years starting of as a tutor in 1981, obtained her undergraduate degree in biomolecular science from Portsmouth University

in the UK. She holds a PhD in Biochemistry from Queensland University in Australia.

My job involves ...

... two areas. As deputy vice-chancellor (Research and Innovation Affairs), I take care of all matters related to research and innovation at the university.

I put in place research strategies as well as identify resources and infrastructure so that our lecturers can conduct research to their fullest potential.

As a molecular biologist, my job is to understand the genetic blueprint or DNA – how processes work in the cells. My passion is to understand how it all works at the molecular level.

My morning starts with ...

As a deputy vice-chancellor, I start with clearing my paperwork so that officers can execute my directives. I chair meetings on strategy and planning as well as hold workshops on how we can turn UKM into a more prominent research university.

As for my role as a professor of molecular biology, I have weekly meetings with my research group as well as my postgraduate students and post-doctoral fellows.

To qualify, you need ...

To be a molecular biologist, students can opt for a bachelor of science in molecular biology or biochemistry at UKM or other institutions.

This is followed by a Masters in genomics, biotechnology, bioinformatics and biosafety law, and a PhD in biochemistry and molecular biology.

The best person for the job ...

... is an individual who has tenacity, as research often takes many years.

As a scientist, you need to be curiosity-driven, identify your strengths and understand what it takes to carry out research so that you can propel yourself to your best potential.

I love my job because ...

In the context of science, it gives me great satisfaction to understand biological processes at the molecular level.

As an example, a cell will die but I want to know how and why so that I can explain the processes.

I like to relate all these to the students and want them to understand how exciting and wonderful biology is.

What I dislike most ...

In management, I dislike seeing people sink into mediocrity – it is an illness to the individual and organisation.

I hope people will always explore their potential and do the best they can.

Prospects for the future

...

... are enormous. When people understand genomics or processes in a cell, the implications are wide as graduates can have careers in healthcare, business, the environment, and many other areas. They can also become entrepreneurs.

They can continue with research into areas of their interest and hopefully aspire to be our home-grown Nobel Laureate.

At the same time, they can work at creating jobs for others. This in turn creates prosperity for the nation.

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