MOLECULAR MEDICINE AND HEALTH

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Genome revolution is happening across many disciplines with enormous impact

AS the founding president of the Genetics Society of Malaysia, which we launched in 1994, I remember the extraordinarily exciting journey represented by the human genome project many years ago, and how it has since transformed medicine.

When the human genome project was completed, it marked a key milestone in both science and human history. However, at that time, research in human and whole genome sequencing was enormously expensive, especially in Malaysia. Only few countries could afford such technologies.

With advances, we are seeing rapid acceleration in making genome sequencing cheaper, providing more research opportunities for the low- and middle-income nations.

The genome revolution is happening across many disciplines with enormous impact, especially on medicine. We now have molecular medicine, genomic medicine and even personalised or precision medicine.

In 2015, then president Barack Obama launched the United States Precision Medicine Initiative — a revolutionary effort to improve health worldwide through the development of individualised treatment based on genetic, environmental and lifestyle factors.

The key to successful precision medicine is a strong, solid database of health records and genetic codes of patients and healthy volunteers for comparison. With these, Malaysians may help discover risks and cures in ways unimaginable until recently, through the detection, measurement and analysis of a wide range of biomedical information.

There is a lot to be discovered and learned in molecular research on diseases in the local context. And, Universiti Kebangsaan Malaysia's Medical Molecular Biology Institute (Umbi), under the able stewardship of Professor Datuk A. Rahman Jalal, has one of the region's best-equipped genome sequencing centres, and many of its findings have been published.

The idea to set up Umbi was first mooted when I was deputy vice-chancellor in UKM way back in 2000. The top management of UKM then challenged researchers at the Faculty of Medicine to come up with a working paper to set up a research institute focusing on medical and health research.

Today, the result of that initiative is testament to the commitment of the nation to research and development. The recognition of Umbi as a Higher Institution Centre of Excellence reflects its quality of research.

And, as science adviser to the prime minister, certainly I would like to see more research institutes like Umbi.

There has been a lot of molecular research done on non-communicable diseases of particular pertinence in Malaysia, which has the worst prevalence of obesity and Type 2 diabetes among Southeast Asian adults. More than one in six Malaysians have Type 2 diabetes mellitus, and the problem is rising. Obesity and diabetes are closely linked and both genetic and environmental factors are involved.

Therefore, identifying those at risk via genotyping is important to inform medical advice and interventions, and personal lifestyle decisions, including diet and exercise.

Malaysia must devote more resources and effort towards preventive strategies. If this rising unhealthy trend in non-communicable diseases is not controlled, and if our health promotion efforts fail, we are certainly heading for a health crisis.

Cancer, meanwhile, contributed to almost 14 per cent of deaths recorded in Malaysian hospitals, making it the third most common cause of death after diseases of the circulatory and respiratory systems.

Many of these cancers are preventable by managing and avoiding common risk factors, such as smoking, alcohol, obesity and sedentary lifestyle. Early detection via cancer screening programmes will also improve survival.

Through the Health Ministry, the government is embarking on many health promotion strategies, and escalating public awareness and prevention strategies, in line with the 11th Malaysia Plan and the National Strategic Plan for Cancer Control Programme 2016-2020.

Cancer biology, cancer genetics and biomarkers for early detection, as well as targeted therapies, will help equip doctors in their work. And, researchers can help policymakers create better strategies and programmes.

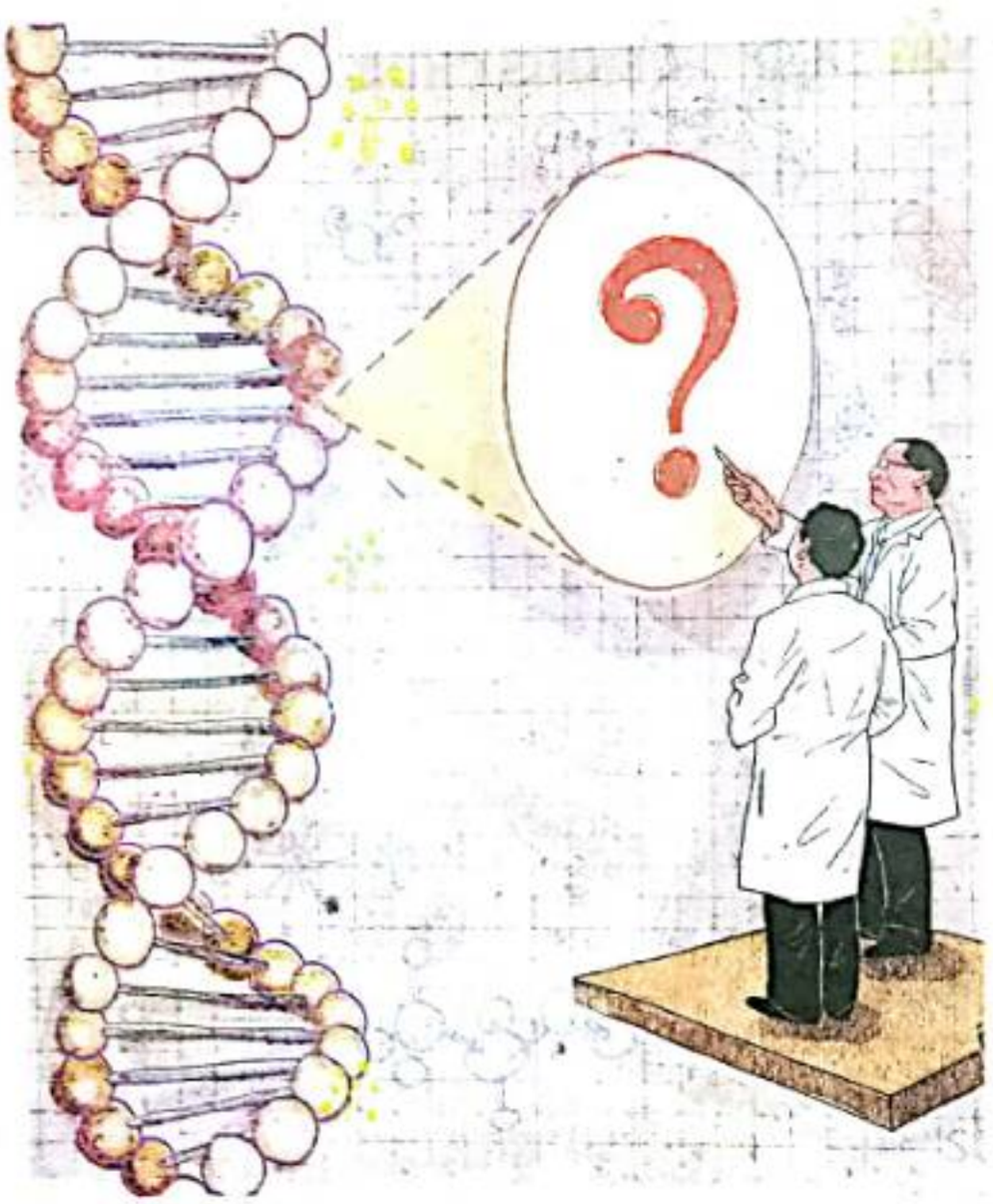
A flagship project at Umbi is the Malaysian Cohort project, approved by the cabinet in 2005.

This project has recruited more than 100,000 participants, collecting health data, biophysical measurements and bio-specimens. This will allow researchers to study the risk factors for various diseases and provide a valuable resource for discovering diseases through biomarkers.

Umbi also has taken steps to set up a genome database, which will store data from Malaysian patients with various non-communicable diseases, including cancers. This offers an opportunity to start regional initiatives in data sharing and collaborative research.

We are well aware that the majority of current knowledge in these diseases is largely derived from research on Western populations, and East Asian populations, such as China and Japan.

We also know that lifestyle, genetic make-up and other factors differ among Malaysians. For this reason, it is essential that we work at home to learn more about the diseases in our national population.



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The writer is science adviser to the prime minister. Excerpted from remarks at the 7th Regional Conference on Molecular Medicine Kuala Lumpur, Nov 10