Jeffrey Tzen – President, Taiwanese Society of Molecular Medicine

In order to succeed in translating precision medicine to clinical practice, quality laboratories under strong regulations must be created

18.07.2019

Tags: Taiwan, Precision Medicine, KOL

Dr Jeffery Tzen, president of the Taiwanese Society of Molecular Medicine and precision medicine key opinion leader, offers insights into Taiwan's adoption of the emerging field.

What motivates you in your pursuit of developing Taiwan's precision medicine space?

When I was living in the US, I decided to come back to help take care of my mother who had been diagnosed with breast cancer. She was very responsive to treatment and her clinicians were convinced she was cured. However, 15 years later she relapsed with metastatic breast cancer unexpectedly and it was too late for treatment.

While Taiwan has very good scientists and researchers, the papers that are published often do not have impacts outside of the laboratory for patients like my mother. Therefore, I am committed to using the experience and knowledge I have gained to have real societal applications that will benefit the lives of people rather than just publishing papers for the purpose of building a reputation.

How do you expect the emersion and application of precision medicine to disrupt the global healthcare paradigm?

By looking at a patient's genetic profile, we can identify their existing predispositions to diseases. Moreover, by taking into account environmental and lifestyle factors, we take this a step further and even predict the most high-risk diseases. In the end, one goal of precision is to use this information to consider how we can try to prevent these conditions.

What are the major challenges being faced by the precision medicine sector currently?

In recent years, medical science has progressed extremely fast, especially after the decoding of the human genome which has produced a large quantity of information. This has made traditional medicine unable to withstand such massive knowledge. Due to the focus on healthcare payments, Taiwan's major medical centres have no intention of cultivating medical services that are not reimbursed by the healthcare system. Therefore, the information generated after decoding human genes is almost exclusively used in scientific research.

In order to succeed in translating precision medicine to clinical practice, quality laboratories under strong regulations must be created. Unlike in the research environment, when working with real patients, the outcomes of genetic screenings must be accurate and consistent with each test.

How receptive are healthcare professionals who tend to be conservative in their practices to growing fields of medicine like precision and molecular medicine?

New information has been growing overwhelmingly while most high-techs are unheard of in physician's training. It is not surprisingly that healthcare professionals are often reluctant to accept new technologies. Therefore, precision medicine is often patient-driven – individuals who are interested in the technology and ask their doctors to connect them with clinics like Forlab.

I founded Forlab with the mission of becoming the bridge between precision medicine and clinical services. Through this bridge, people can find clinically useful technology for medical purposes, whereas biotech companies can provide high-tech services to health-conscious persons. Through our genetic consulting work, we are able to help patients have a deeper understanding of their own health and the clinical results they receive from physicians and medical tests. Forlab decodes more than 22,000 genes from the body, i.e., the whole exome, to analyze how health is derived from

hereditary. Forlab also analyzes circulating DNA and microRNA in the peripheral blood to monitor tumour evolution in cancer patients. By knowing the status of cancer cell evolution, we gain insight into the conditions of cancer in patients.

How is precision medicine industry being developed outside of the laboratory for translational application?

I believe that technology is very straightforward – any scientific capabilities are limited to the equipment and platforms that are available. Application, on the other hand, is a different story. The know-how and knowledge requirements for utilizing precision medicine and molecular diagnostics are enormous.

The industry and clinical sides are equal, both using the same techniques and sequencing platforms. There is a higher level of knowledge in medical centres that is only meeting the purpose of scientific research and publication. Even though these physicians are on the clinical side, working next to patients, they still operate on more of an academic level.

On the other hand, the industry is focused on business which means real-world application. However, industry stakeholders have limited knowledge about medical practice and precision medicine. By the end of 2017, there were 167 next-generation sequencing (NGS) platforms across Taiwan. The technology is very accessible but the know-how is limited. One side has a very strong understanding of how the data can be interpreted and used yet no connection to the real world while the other has the ambitions but not the means to apply best practices.

Companies can perform molecular mapping to identify which kinds of target therapies can best fit a patient. However, about 80 percent of cases will not find a match and in the other 20 percent, a majority of the compounds are in clinical trials and are inaccessible to patients. NGS has many potential applications and searching for targeted therapies is just one of them.

What’s your background as an expert in the field and your priorities moving forward?

After receiving my PhD in molecular biology from the Mayo Clinic Graduate School of Biomedical Sciences, I became a pathologist at the University of Tennessee. I returned to Taiwan in 1997 as chairman of Mackay Memorial Hospital. 12 years later I moved to Cathay General Hospital to head the Department of Pathology & Laboratory Medicine. Later on, I was elected president of the

Taiwanese Society of Molecular Medicine in 2015 which a role that I still hold.

As you can see, I am very interested in molecular medicine, especially in the diagnostic side of the field. Molecular medicine in recent years has begun to attract a lot of attention from the healthcare industries and not only has the technology in the field changed tremendously, so has the concept of its clinical application. The sophisticated data which can now be gathered must be accomplished by a new approach to truly evolve precision medicine from just a research area.

My aim is to continue expanding on what I am doing in Forlab for the real world. I hope that I can be a role model for the industry on how precision and molecular medicine can be practically utilized. I provide advice to biotech companies when they seek the unmet medical needs, to pharmaceutical companies when they seek methodology to identify their potential clients, and to clinicians when they seek sophisticated diagnostics for difficult cases. As a former professor, I am used to teaching people about this field of medicine and I am willing to be a leader in Taiwan as long as there is a motivation to learn. I would like to see Taiwan’s patients be able to benefit from personalized medicine at the same level as other leading healthcare markets like the US.

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