Tony Mok â?? Chair of the Department of Clinical Oncology, Chinese University of Hong Kong

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One of Asiaâ??s most pre-eminent oncologists, Professor Tony Mok is perhaps best known for discovering the EGFR mutation gene and subsequently developing a targeted therapy that is more precise and personalized than standard chemotherapy. Here, Professor Mok discusses his current research areas of focus, some of the key clinical trial trends in Hong Kong and Asia, and his assessment of Hong Kongâ??s biotech ecosystem today.

Could you introduce yourself to our international audience and share some areas you have been actively engaged in or are of interest to you?

I am a medical oncologist and professor of clinical oncology at the Chinese University of Hong Kong (CUHK), where I also chair the department of clinical oncology. My interest in lung cancer started about 20 years ago, at a time when there was minimal treatment in this area apart from chemotherapy.

The first driver oncogene was called EGFR (epidermal growth factor receptor) mutation, and its discovery in 2004 helped us to ascertain that there is a greater prevalence in the Asian population for lung cancer. We did the first randomized study at CUHK in collaboration with multiple centres and

AstraZeneca. This proved that molecular targeted is more effective than chemotherapy on patients harbouring this mutation and that gave us the foundation for the first step of personalised therapy for lung cancer.

Ever since then researchers have identified 10 driver oncogenes related to the disease and more than 30 drugs available for different targets. The concept of personalised medicine according to molecular tests has become standard practice across the globe.

I have done research on immunotherapy targeting the PDL1 and again, have helped in evolving the global standards of care through a number of studies.

Moving on, there are multiple new platforms for treatment of lung cancer and other cancers that Hong Kong should be engaging in such as antibody drug conjugates (ADCs). There is now a huge research program on biomarkers and their application for such treatment programs.

The next wave is cell therapy. CAR-T is now the standard in haematology, but it will be used for the treatment of solid tumours and we have to look at how patients are selected down the line.

The relatively high prevalence of lung cancer among Asian populations is well known today, but how does the level of efficacy for new treatments among these populations differ from what has been done before?

The prevalence of lung cancer in the non-smoking population is higher in Asia compared to the rest of the world. Within the smoking population it is similar, but we found that over 50 percent of the cases are related to the EGFR mutation or other driver oncogenes. Patients receiving driver oncogene therapies tend to survive for three to five years, compared to less than a year without them. There is therefore no doubt that these personalised therapies are having a significant impact on survival rates in Asian patients.

Historically, clinical research has tended to over-represent Caucasian patients, but this is changing as clinical trial diversity climbs stakeholder agendas. How important is it to incorporate Asian populations into clinical studies?

It is not just about diversity for diversityâ??s sake, as the pharmaceutical industry invests heavily in clinical trials and their expected efficiency and accuracy. Previously, the US represented an obvious choice as a trial location, but we are now creating a streamlined and highly efficient clinical trial machine in the Asia Pacific region. The aforementioned IPASS study (Mok et al NEJM 2009) I helped run 20 years ago contributed to the development and we had 1125 patients all from mainland China, Hong Kong, Japan and a few other Asian countries. The results were published in the New England Journal of Medicine and it has had over 7000 citations, helping the drugâ??s registration in most countries except the US.

This proved that we can undertake clinical studies in the region and have the results well recognised internationally. The region is now investing heavily in the required infrastructure. Patient enrolment is extremely fast here and in mainland China, and the data is of very high quality. In the past for convenience, US companies would undertake Phase I trials in the US, but Hong Kong and China are improving their capabilities, while Korea and Singapore are considered world-class. In fact, Korea, Singapore, and Hong Kong have now created a consortium to collaborate on Phase I lung cancer trials.

Some of the countries you mentioned have made clinical trials part of their policies for innovation. Do you believe that stakeholders in Hong Kong have a sufficient understanding of the importance of clinical trials in nurturing and promoting innovation?

Thatâ??s a critical point. I would say from a practical angle, the quality of the investigators, doctors and academics in Hong Kong is as good as you will find anywhere else in the world. The issue arises from the fact that Hong Kong is a dual system, with the Hospital Authority (HA) and academic systems running separately.

The HA runs all the hospitals, including academic hospitals such as Queen Mary and Prince of Wales both accredited for clinical trials. Because the HAâ??s mandate is to provide healthcare, they run the Phase I trials in these hospitals in an overly cautious and minimalist way, and academics struggle to find a space to operate Phase I trials in this ecosystem at the world class level they want to.

This is different to countries like South Korea where the government mandates hospitals to have high-level clinical centres for Phase I trials which operate separately. We have a system in which the HA controls everything, so we must work with them, but it is not an ideal solution to produce the world-class Phase I studies we know that Hong Kong is capable of

There are organisations in Hong Kong that have given suggestions of what can be done to improve the system, but I am not optimistic that it will change anytime soon.

Some Chinese biotech executives prefer to deploy their clinical trials outside the mainland because they feel concerned about data transparency and quality coming from China. What is your opinion on this?

My perspective on this comes from my experience as a member of the board of directors at HUTCHMED, a China-based pharma company listed on NASDAQ and HKEX, as well as AstraZeneca, one of the leading multinational pharma companies in China. There is no doubt from a scientific perspective that there is high quality research that has genuine and auditable data coming out of China.

It is a matter of who is going to investigate that data and in what style. If the FDA is demanding certain data, especially from Chinese military hospitals, then political and policy issues can be of some hindrance, but the data itself has no issues and is recognised for international registration. Data from Hong Kong or Korea may be easier to use internationally, but these countries do not have the mass or volume that China has. Therefore, more open and cordial collaboration is needed!

Given that Hong Kong lacks abundant numbers of patients, what are your thoughts on greater integration with mainland China via the Greater Bay Area (GBA) initiative, with Hong Kong acting as a bridge to the international community?

In theory it is a good concept, though there are not as many high-quality centres in the GBA as in Beijing and Shanghai. These are now being built up in certain major GBA cities, like Guangzhou and Shenzhen, but this will take time. In principle, patients from the GBA should be able to cross the border and come to Hong Kong for clinical trials, but there is a lot of bureaucratic tape for a non-

Hong Kong citizen when using a local hospital. We do not make it easy for Chinese citizens who want to take part in Hong Kong clinical trials.

Therefore, if Hong Kong wants to make itself a clinical hub, we must firstly have a clinical trials structure independent of the HA. Secondly, we must make it easier for Chinese citizens to take part in our clinical trials. Thirdly, immigration must be made easier as currently Chinese citizens need a 7-day permit to stay in Hong Kong and must renew it to stay on, which they may have to do for a clinical trial.

What is your assessment of the biotech ecosystem in Hong Kong today and the ability of academic research projects to be translated into viable commercial concerns?

The Hong Kong government has made significant efforts over the past decade to encourage entrepreneurship and accelerate innovation and technology development, so that is a step in the right direction. They have invested tremendously into helping university professors commercialise their technologies. The Science Park, a well-run organisation with excellent facilities, was a big help for me in my organisation, and continues to act as a catalyst in this regard.

I had a very positive experience, having grown my own company from one person to 60 people with a lab in Hong Kong and Thailand and finally selling it. What may be lacking is connecting the talents of entrepreneurship and academia in Hong Kong. Many academics have a good concept, but do not want to take the risk to make it a bigger idea and are generally not well versed in topics like fundraising and the overall running of the business. Nevertheless, steps are being put in place to change this mindset and allow professors to run a company while retaining their roles at universities.

What is your final message to the international community about Hong Kong?

People should not see Hong Kong as just a small area, but should come here and make use of the abundance of individual talent available. We are not lacking in knowledge and the young talent will be able to offer any company the services they need for innovation and technology development, especially in the field of oncology.

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