Paul Tam â?? Chair Professor & VP, Macau University of Science and Technology

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Paul Tam, who serves as chair professor & VP at Macau University of Science and Technology as well as emeritus professor and honorary clinical professor of surgery at the University of Hong Kong, has made important contributions to advances in paediatric minimal invasive surgery, genetics, and regenerative medicine of birth defects. In addition to his academic career, Professor Tam is also vice chair & scientific co-founder of cell and gene therapy company Xellera Therapeutics. He explains his current research in Gut Liver Organoid Advanced Sciences (GLOAS), Xelleraâ??s niche advantage and plans to set up a clinical trial centre in Macau.

Having made significant contributions to advances in minimally invasive paediatric surgery, genetics, and regenerative medicine around birth defects during your distinguished career, what is the primary research area you are focusing on today?

Today, my team and I are looking primarily at Gut Liver Organoid Advanced Sciences (GLOAS). The idea is that we provide a human surrogate platform for the advancement of diagnostics and drug

therapeutics. Most of the preclinical studies being conducted for new therapies today are done on animals, and this is not ideal for regulators as when you come to later stage clinical trials you are basing your data on human trials. With advances in stem cell biology, we are creating human mini-organs and introducing certain disease models. The specific disease model is then used to better understand the disease process from the beginning and then we can design and test the best target for intervention in this in vitro system.

This is also used for drug screening. When you test a new therapy or molecule you must not only look at the efficacy but equally the toxicological impact on the body. For example, if you have a therapy for the heart, you need to consider the impact will it have on the gut and liver. With our system, we are testing the toxicity on the liver and gut, while colleagues in another group are focusing on the heart. We have synergies with this other group, but we started much later, only building the idea from academia three years ago.

Competition is getting hot in the global biotechnology space. What sets Xellera apart from other companies?

First, we had an IP that gave us the platform to grow. It is a very niche area and connects science with the clinic. I am a practising clinician, so I am not remote from the battlefield, and I know what is needed, what works and what does not work in the clinical setting. This will give us an advantage as we may be able to skip some hurdles that might be obvious to myself but maybe less so for other companies.

Secondly, the science we use is reaching the market at the right time both in Hong Kong and globally. Stem cell technology in combination with genomics have been powerful drivers in making what was previously conceived as impossible, possible. This is very exciting as in my academic past we were concerned with understanding the mechanisms involved in a disease but hit roadblocks in how to utilise this knowledge for the advancement of treatments. Now, with the advancement of technology, we can be focused on intervention and prevention roadmaps and really break the glass ceiling and discover breakthroughs.

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Is the environment in Hong Kong conducive to growing biotechnology companies?

In the past the environment was not particularly advantageous and there were not enough incentives for academics to be engaged in the industry. I am pleased that Hong Kong has changed for the better, but we still have a lot to learn from great models in the US, like in Boston. People today are looking less towards purely academic publications and citations, but more so for recognition of knowledge that advances and benefits humankind such as curing or preventing diseases.

Is this being factored into the KPIs of academic institutions?

I have done this for years, but changing the direction of an ocean liner requires a lot of effort. You have to infiltrate the thoughts of the leadership group and then this idea will cascade and filter down the chain to the frontline academics. One great system in the university is peer recognition. If we can ensure that peers collectively have the same passion for entrepreneurship that they have for purely academic pursuits, there will be less dragging of feet when it comes to making the changes required for this shift in the ecosystem. The universities must accept such a cultural shift, but we must overcome the unconscious bias to the old academic views that still exist today.

Since 2022, you have been VP of Macau University of Science and Technology. What has your experience been of this position?

The university itself is only 23 years old but is in the top 250 globally. We are competent in many areas of research but have also precisely chosen niches in which we can be larger players on the global scene.

It is a private university where translational research is placed as a top priority, and it is actively encouraged. As a university leader, I can set an example with my success to show the fruitful nature of dealing with the industry. The fear factor of going into the unknown from IP to commercialisation still exists, compared to the clear pathway of research that ends in publication and peer recognition. We need serious entrepreneurs, and we are pushing for that in Macau.

Furthermore, we want not only CEOs and CSOs, but also CMOs in the field of biopharmaceuticals. To do this, we have partnered with Peking University to set up a program to nurture the next generation of CMOs that will be able to operate in China and hopefully the rest of the world

Macau is part of the Greater Bay Area. What are the advantages in being located here?

Macau, like Hong Kong, can benefit from its geographical location and history and the â??one country, two systemsâ?? principle. I believe we can be complementary to Hong Kong in many ways.

I would say Macau has perhaps a smoother relationship with mainland China and is better integrated into their system, while Hong Kong holds an advantage on the international market, despite the fact that its reputation suffered some challenges in recent years. Overall, we have seen that the view of the Greater Bay Area here is significantly more positive than in the past. China can go forward and develop on its own, though it would be able to do this a lot faster with international collaboration, and we want to be able to connect both sides and act as a knowledge and regulatory bridge.

What do you see in Hong Kong that you would like to bring over to Macau?

Hong Kong has had a clinical trial centre for the last 20 years and this acts as a one-stop service for its partners. Pharmaceutical companies reach out to them, and then they are linked with relevant local experts to set up contracts and procedures for phase 1, 2, and 3 trials to be conducted, both internationally and in China.

We see it as a win-win for the industry and Macau to have a similar centre here at the university and we are putting it all in place currently. We could offer clinical trials for the products we discover through our research and by working with the Hong Kong centre offer a service platform for the

Greater Bay Area. The population size would not be a concern as the Greater Bay Area is expected to reach 100 million people by 2030.

We have talked a lot about innovation and translational medicine. Do you believe the stars are aligned for success?

In China we say that you must have timeliness, ecosystem, and people, and I think for the first time ever these three are aligned. In the past 20 years Hong Kong has had the ability to attract and nurture talent and this will continue, but we must make sure that we continually invest in being a premier site for leading researchers as it is a global competition.

What was less developed in the past was entrepreneurship, but as mentioned earlier, we are overcoming these hurdles. Leadership groups and scientists are embracing a shift in culture to promote translational research, while the government is investing more and more in the incubation of start-ups to the commercial stage. This really has been the case for the last three governments and if there is a willingness to be patient in the long term, the ecosystem will continue to benefit.

In terms of timeliness, we are living in an era that is experiencing major healthcare challenges and are witnessing an evolution of the view of ordinary people towards healthcare. They are not taking science and technology for granted at all as they see the visible improvement and safeguards we can provide against health hazards, which was expressed clearly during the COVID-19 pandemic.

Another point is that interdisciplinary collaboration is a necessary step in the development of research and commercialisation. Having the same team and approach only yields incremental advances, but by promoting the use of interdisciplinary connections and diverse teams we will experience bigger discoveries, and these are the innovations that have a larger chance of commercial success on the global market.

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