Interview: Jun Wang – Founder & CEO, GeneHarbor Biotechnologies, Hong Kong



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Jun Wang, founder and CEO of GeneHarbor Biotechnologies, introduces his company's innovative technology platform and the specificities of the start-up ecosystem in Hong Kong.

Dr. Wang, can you firstly tell us more about GeneHarbor's innovative technology platform? What makes it so special?

GeneHarbor is working within the chemicals industry, which has an annual output of over USD 6 trillion globally. Roughly 65 percent of that (USD 3.8 trillion) is in household chemicals and fine chemicals, including the pharmaceutical industry. This entire segment is currently being manufactured mainly using chemical catalysts, when at least 60 percent of them – nearly USD 2 trillion – can be produced using biological catalysts, i.e. enzymes. Today, only a small fraction, less than 2 to 3 percent, is being manufactured with enzymes, with mainly two products, high-fructose corn syrup and cephalosporin antibiotics.

Biological enzymes-based manufacturing processes have a host of advantages over non-enzymatic processes. To name just a few, enzymatic reactions are highly specific, thus generating much less waste and byproducts. These reactions take place under mild conditions, typically without the use of polluting chemicals. The conversion rates are more favorable, achieving higher product yield. They are chiral-specific, which makes them particularly suitable to synthesizing pharmaceutically/biologically-active products. On top of that, they are non-toxic and

biodegradable. Finally, their production is easy to scale-up.

The logical question then is why mainstream production has continued to rely on chemical catalysts. The primary reason is that enzymatic processes have thus far been very expensive, due to the high cost of enzymes, high cost of the necessary co-factors, and low efficiency of the enzyme reactors.

For the past 12 years, GeneHarbor has concentrated our efforts and resources on inventing an innovative enabling, comprehensive biotechnology platform called the Immobilized Enzyme Assembly for Cascade Biocatalysis to address the above three major obstacles. This platform technology has allowed us to dramatically reduce the cost of enzymes by 80 percent or more in many cases. In doing so, we are able to translate many scientifically feasible but commercial nonviable processes into commercially viable processes.

My prediction is that in 15 years – or 10 years, if we work very hard – at least 30 percent of this market segment can be – and should be – produced by enzymes.

The obvious question here is how GeneHarbor has managed to achieve this breakthrough platform technology, where presumably many other companies with deeper pockets and more researchers have not?

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The reason, firstly, is to locate the key problems, or the pain spots, of the industry. One of the serious lessons I have learnt during my early years of transition from an academic into an entrepreneur is that you have to think from the industry perspective, driven not by the curiosity of a scientist but the needs of the industry. The pain spot of the enzyme industry is one word: the cost. The work of my last two decades has been to prove that this is the case.

We have taken an integrative approach to reduce the cost of the enzyme. GeneHarbor is – I believe – the only enzymatic company in the world to be able to perform all the six major steps in the enzyme production, and furthermore, to possess cutting-edge technology in each of the six steps.

Secondly, we have exhibited unprecedented persistence and sacrifice. Very few people will spend the long and lonely 20 years and substantial amounts of money to pursue a single endeavor. To do truly innovative work is both very hard and very lonely because you do not have anyone to follow or copy. It is also very expensive. I suspect many companies begin on a similar journey but give up after the first hundred steps. That said, the eventual reward is great. If you have truly innovative and useful technology, you will reap the rewards.

GeneHarbor is lucky to have this perseverance within the company. Like an internet company, we are very light in hardware assets. GeneHabor's most valuable assets are the 100+ patents and our 30-to-40-strong R&D team. This employee longevity is critical to our success, firstly, for confidentiality issues, and secondly, for the continuity. I am also lucky to have the continuous support of our shareholders.

From your personal experience, how would you assess the start-up environment in Hong Kong?

GeneHarbor was fortunate to have a full portfolio of institutional and individual investors, complemented by government funding. We also generate substantial revenues from the licensing of our technology platform to our partner companies.

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I think that an original innovation company requires four major ingredients for survival: money, manpower, information, and incentive. For each of those ingredients, I daresay Hong Kong is better than Taiwan and Singapore. To add to that, in Hong Kong, the Closer Economic Partnership Agreement (CEPA) grants us unfettered access to the mainland China market, which is huge. Another plus for Hong Kong: according to QS2018, four of the universities in Hong Kong rank in the top 100 in the world.

That said, I think one issue has been the gap between the fantastic research being conducted in our topnotch universities, and the translation and commercialization of these research. Unlike Singapore or Taiwan, we do not have dedicated research institutions; all R&D investment goes to universities. Professors should be encouraged to conduct, not restricted from, industry research. Another factor is the fact that the shortage of space in Hong Kong makes manufacturing problematic. There is a shortage of land as well as waste and environmental treatment facilities.

What value can the life sciences industry bring to Hong Kong?

Hong Kong is keen to reindustrialize, but it needs to be very selective about the industries. For instance, car manufacturing would obviously not be a good fit. The industry must maximally utilize the talent here, without the need for a huge piece of land and be responsive to incentives, which would take advantage of our rule of law. Biotechnology fits this profile very well. Furthermore, the two public hospitals in Hong Kong, Prince of Wales Hospital and Queen Mary Hospital, have the huge advantage that clinical trials carried out there are recognized by both the Chinese FDA and the US FDA, which is unique in the world outside of China.

I think the government should invest even more resources into this sector. I glad to witness the positive encouragement the Hong Kong X-tech Startup Platform, which opened its doors one year ago, has brought to the scientific community of Hong Kong. The organization, which I am proud to be part of, promotes innovation and entrepreneurship in the territories. Hong Kong people are very responsive so they will adapt to new incentives and policies very quickly, and this sector can generate many employment and growth opportunities for the young generations, which is of critical importance.

Coming back to GeneHarbor, what is the next milestone for the company?

After the fully establishment of our platform technology two years ago, we started to develop manufacturing facilities in China. GeneHarbor now has one in full operations in Shanghai, a second in Changshu, Jiangsu Province, due for completion in end-2017, and a third in Ningbo, Zhejiang Province. Almost every week, our R & D team is also making new discoveries, some small, some big. We have by now accumulated over 100 international patent applications. The focus now is to translate our technology advantage into money, to convert the science into dollar signs ($), and to convert our IP into an IPO!

We have concentrated on working with products that are uniquely suitable for our platform, i.e. products that have a high technology barrier, a large market and can fully benefit from our cutting-edge technology. Through this, we can avoid competition and lead the market. GeneHarbor already has a number of products with huge market potential, so in the next couple of years, I want to spend more efforts and resources on the marketing.

The English slogan of the company is “We Engineer Enabling Enzymes”. We would like to send an invitation to the industry: if you find it difficult to manufacture a product, please talk to us and try GeneHarbor’s technology platform!

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