Piers Ingram â?? Co-Founder & CEO, Hummingbird Bioscience

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Dr Piers Ingram, PhD, co-founder, and CEO of Singapore-based biotech Hummingbird Bioscience, shares his motivation for establishing the company in 2015, their proprietary Rational Antibody Discovery (RAD) technology platform, and rich pipeline of clinical assets in global development.

Piers, could you share the motivation for the establishment of Hummingbird Bioscience in Singapore back in 2015?

My co-founder, Jerome Boyd-Kirkup, and I started Hummingbird Bioscience as we believed that the rapidly emerging technologies and data-rich computational approaches to analyzing and understanding biological systems that academic scientists use are not being fully exploited for therapeutics discovery and development. While no single approach will ever be a silver bullet; these approaches, when used together, can be very effective in providing additional insights into the underlying biological problem we are trying to address and provide powerful new tools and approaches for the discovery of potential therapeutic candidates.

Hummingbird Bioscience has its proprietary drug discovery platform, the Rational Antibody Discovery (RAD) platform. How did this come to be developed?

We were initially intrigued essentially by a puzzle. The HER3 protein is a well-known drug target that is able to potently activate a key signalling pathway known as PI3K, and there is strong evidence of the role of HER3 driving activation of this pathway in many cancers â?? yet when companies had tried to drug HER3 the results had been extremely disappointing.

We hypothesized that there may be nothing wrong with the target â?? but perhaps instead the antibodies that had been developed to inhibit its activity were not as potent as anticipated. As we dug into the data there was more and more evidence for this â?? almost all the antibodies that had been tested against HER3 bound to the protein in a very similar region â?? and as a result, had a very similar mechanism of action (blocking the binding of the HER3 ligand). What was rapidly emerging as this earlier generation of antibodies failed was that HER3 has multiple ways it can become active â?? and to truly inhibit its activity antibodies with a new mechanism of action would be required that could block all modes of activation.

The motivation to find such an antibody led to the creation of Hummingbirdâ??s proprietary Rational Antibody Discovery (RAD) platform â?? this is the first technology we are aware of that allows for precise targeting of an antibody to specific functional regions of a protein (epitopes). Another way to think of this is that it starts to bring the power of rational drug discovery that has been so important in small molecule discovery to biologics for the first time.

With the RAD platform we were able to identify a key epitope on the HER3 dimerization interface that is critical to all modes of HER3 activation and engineer a strong antibody response to that highly desirable, yet previously elusive, epitope. This rational engineering led to the development of HMBD-001 as the first proof of success for our RAD platform.

Since then, we have applied our RAD platform to many other challenging targets, where combining biological insights about how the protein functions in a disease context, with the ability to hit the specific epitope of interest unlocks entirely new mechanisms and target classes.

You mentioned you currently have a couple of flagship assets, the HMBD-001 targeting HER3, and the HMBD-002 targeting VISTA (V-domain Ig suppressor of T-cell activation). What is your clinical development strategy?

We have two lead candidates that are advancing into clinical trials this year: HMBD-001 and HMBD-002. HMBD-001 is being evaluated as an antibody therapy in a broad spectrum of HER3-driven cancers, including NRG1-fusion tumours, a rare form of cancer. We believe that the latter would provide an accelerated pathway for broader HER3 cancers, including colorectal cancer and castrate resistant prostate cancer. HMBD-002 will be tested in tumour types with strong clinical and pre-clinical evidence for the importance of VISTA, including triple negative breast cancer (TNBC), the most lethal form of breast cancer, and non-small cell lung cancer (NSCLC) which has a five-year survival rate of 15-20%.

Our clinical development is also supported by partnerships including Cancer Research UK (CRUK), which will support our clinical work with HMBD-001; and Cancer Research Institute of Texas (CPRIT), which has provided a grant for the development of HMBD-002.

We deliberately focus on â??hard targetsâ?• in cancer and autoimmune disease that have not been successfully drugged despite having strong biological validation; and deploy biomarker-driven clinical

trials to maximize the probability of successful clinical development, supported by strong capabilities in pharmacology, multi-omics and data science. Our collaboration with Tempus for HMBD-001 clinical trials is an example of how we are using big data and AI-driven tools to advance biomarker-driven studies for our programs.

As a company focused on drug discovery and development, what is your commercial strategy when it comes to taking your assets into later-stage clinical trials? Will your RAD technology platform also be a priority to support revenue generation?

Our commercial strategy is to focus internal development efforts on our key assets that we can pursue to proof of concept, and partner with large biopharma players for later stage clinical development and commercialization.

We typically work on collaboration projects with partners that allow us to apply our skillsets, technical expertise, and knowledge. For instance, we have partnered with Amgen to leverage our discovery and development capabilities in the development of early-stage assets.

You recently raised a sizeable Series C fund that attracted high calibre international biotech investors. Can you share more about the round, how you are using the funds, and what this means for Hummingbird?

We are very encouraged by the strong interest from highly respected specialist investors such as Novo Holdings, Frazier Healthcare Partners, DROIA Ventures, Polaris Partners, Pureos Bioventures, Octagon Capital, among others, with continued support from existing investors including SK Inc, Heritas Capital and Mirae Asset Venture Capital.

As we are able to now understand biological systems much better and leverage the countless advances in the technologies and tools that can enable us to build this understanding, biomedical research is definitely entering a golden era. Hummingbirdâ??s approach centres around deep and critical analysis of the underlying target biology to discover unique therapeutic antibodies that enables our pursuit of precision clinical trials. Our enhanced understanding of disease biology is achieved through our approach to drug development to ensure that we use the advances in biomedical research to our full benefit.

We see this financing as a significant validation of our multi-disciplinary, data-driven, systems biology approach to precision medicine for cancer and autoimmune disease, and the potential of our lead programs.

How do you expect Hummingbird to grow over the next few years?

Our clinical stage pipeline programs are making good progress, and this has been a great motivation and source of excitement among our team, partners and investors. To deliver on both of these programs as well as our earlier stage programs, our teams are expanding significantly across US, Singapore and other global markets. Hummingbird has grown to a 60-something strong team across antibody discovery, pharmacology, computational biology as well regulatory affairs, CMC and corporate development since founding, and weâ??re very proud of our strong internal capabilities in these core domains.

Looking forward, we plan to keep our core discovery and engineering work rooted in Singapore but expand our clinical and business development activities in a wider footprint. We currently have a team of scientists who oversee our key clinical programs in the US and Europe, and are in the process of setting up the foundations for our China operations.

This Series C financing is a key milestone that will enable us to rapidly progress our lead programs into the clinic as well as support additional discovery work and development of our next generation programs.

The biopharma industry is increasingly embracing new technology platforms like the use of AI, big data, computational strategies for drug discovery and so on. Do you see this as the future of the industry â?? and how well have companies embraced this transformation?

It is often said that, compared to other industries, the biopharma industry is slow at adopting technology. However, we are certainly seeing that the industry is starting to embrace new technologies as benefits of such technologies are being realized â?? from biomedical research to drug discovery and even manufacturing â?? including cost and time efficiencies. The demand for faster and better drug development brought on by the pandemic is only going to accelerate the adoption of such technologies.

While transformation is taking shape across the industry, talent and capability building initiatives can be fragmented. But, it is often a learning process that requires both organization and systems-level change, and I believe we are well on our way to truly realize the promise of digital innovation and technologies in the work that we do as an industry.

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