Interview: Michael Krebs – Managing Director, Institute of Molecular Biotechnology (IMBA), Austria

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Michael Krebs, managing director of the Institute of Molecular Biotechnology (IMBA), the leading publicly funded non-university biomedical research organization in Austria, provides an overview of IMBA's role in the Austrian biomedical ecosystem. Furthermore, he gives an insight into Austria compared to the rest of Europe and delivers exciting news on the current ambitions of the country to establish a new Translational Research Center that will help to boost early-stage drug discovery in Austria and establish a sustainable ecosystem between academia and industry.

As the managing director, could you introduce to our international readers the Institute of Molecular Biotechnology (IMBA)?

IMBA was founded in 1999 as a separate legal entity of the Austrian Academy of Sciences, the largest sponsor of non-university research in Austria. The overriding objective of IMBA was to build a world-renowned Austrian institute that aims to open up new areas for research and approach unsettled issues in molecular biology.

At present, IMBA's annual budget has grown to around 35 million EUR (40 million USD). We are a member of the Vienna Biocenter (VBC), the premier location for life sciences in the Central European Region. IMBA operates in very close collaboration with the Research Institute of Molecular Pathology (IMP), a 100 percent subsidiary of the German pharmaceutical company

Boehringer Ingelheim (BI). IMBA shares infrastructure and core facilities as well as various administrative departments with IMP, and most importantly, the valuable knowledge and expertise of our research groups.

What role does IMBA have in the Austrian research ecosystem?

Before IMBA was founded, the IMP had been the country's only internationally competitive basic research institute in molecular biology. Modern biomedical research requires steadily increasing investments in equipment and a critical mass of scientists to keep up with innovative technologies and to attract top talents; therefore, the Austrian government and BI took the decision in 1999 to establish IMBA next to the IMP, but funded with public money. I think we can proudly say, that IMBA and IMP, together with its almost 500 employees, have become one of the leading locations for molecular biology research in Europe and even globally, offering an ideal environment for making a difference in science. Furthermore, they attract some of the brightest minds to pursue their scientific career in Vienna.

IMBA was established with a strong focus on mouse genetics and disease modelling as well as RNA and cell biology. However, we recently explored into the new field of human stem cell technologies, mainly catalysed by some break-through inventions such as the first human brain organoid that was developed at our institute some years ago. At IMBA we believe that 3D systems derived from human stem cells will become the next model organism in modern molecular biology and a very potent tool in screening for new targets or in pre-clinical drug testing. Human model systems allow for more accurate forecasting of efficacy and side effects of new drugs, compared to traditional animal models, before moving them to the resource-intense clinical trials stage.

Our strong expertise in human stem cells and 3D models has opened the door for IMBA to establish future partnerships with the scientific community in and outside Austria, but also with the pharmaceutical industry. IMBA has human models in place for studying Glioblastoma, a very aggressive and deadly form of brain cancer, drug toxicity, diabetic vascular complications and inherited vascular disorders. Other organoids for investigating heart diseases, solid tumours and metabolomic diseases are currently being developed. These new tools make us attractive for industry to invest into our research, a source of funding that will become more and more important for us in times of tight public budgets.

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What structures are in place to attract new partners to collaborate with IMBA?

Austrian life science is increasingly gaining reputation worldwide for its high quality of research. This is well documented by the high share of publications in top-tier journals and a number of ERC grants when compared to Austria's size of population. Unfortunately, when talking to representatives from pharma companies, it becomes evident that these hard facts are mostly unknown to key players. There is clearly a lack of international awareness.

We have recently joined forces to invest into the promotion of the Vienna Biocenter. Vienna is definitely on its way to become an international research hub including a number of promising start-up companies which have been able to attract sizable amounts of funding from international VCs and large-scale deals with pharma companies. However, for the time being there are only two big pharma companies, BI and Shire, with larger research operations in Austria which represents a bottleneck for interactions with industry. A relocation of EMA from London to Vienna may bring an enormous boost and hopefully lead to an increasing interest of big pharma to further invest research money into Austria and institutions, such as IMBA.

As a member of the Pharmaceutical Association of Austria (PHARMIG), IMBA has established contacts with most of the pharmaceutical companies operating in Austria. Together with local management we organize site visits of international research teams to discuss opportunities for collaboration. Due to our close collaboration with the IMP, there are of course regular meetings with BI researchers. From time to time, IMBA also participates at international partnering events such as the international BIO conference or BIO Europe.

Where do you think Austria excels in term of R&D?

I think, Austria is one of the most undervalued research locations in the world. Despite the challenges associated with a fragmented research landscape, Austria at present is excelling in the therapeutic areas of immunology and oncology as well as displaying very good expertise in antibody and vaccine technologies. Furthermore, bioprocessing and industrial biotechnology is doing well in the Styria region.

How does IMBA attract world-class experts to conduct research in Austria?

Over the last 13 years, IMBA has been able to build up a strong reputation across the scientific community for the recruitment of junior faculty. However, we increasingly face the challenge to offer potential candidates a longer-term perspective in academia or credible options to pursue their professional careers in industry. We are in discussion with representatives of Universities in Vienna to build an integrated career structure that allows junior group leaders, which get only a non-permanent position at IMBA, to stay in Austria and to continue their academic career as associate

and finally full professors. We very often make the experience that people would love to stay in the Vienna region because of its very high quality of life, but there are currently limited positions in academia and not enough open positions in the healthcar industry to absorb them.

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On the PhD and post-doc level, IMBA and the Vienna Bioecenter is ranked as a top location in Europe. Nevertheless, like other research hubs, we face increasing competition from emerging research locations, especially from the Asian region, where governments are investing enormous resources to build new research centres from scratch. To counter this, us and our partners at the Vienna Biocenter, have established two dedicated education programs for PhDs and undergraduates, the VBC international PhD program and the VBC summer School. These programs are very popular among the scientific community, but we must continue to invest into these programs to meet our future demand of top candidates. Our next goal is to add a competitive master's program for undergraduate students to get early access to potential PhD candidates.

Finally, IMBA invests a lot of money into its scientific infrastructure and core facilities. Our state of the art facilities provide an ideal "playground" for talented young scientists to pursue their research ideas and provide us with a competitive edge towards other research clusters.

If we come back in five years, where will we see IMBA?

It's our clear vision for next five years to build up a strong faculty in stem cell biology to complement our existing strength in disease modelling, RNA and cell biology and to finally position IMBA as one of the leading locations for stem cell research in Europe. With our recent recruitments of new group leaders and the successful establishment of state-of-the-art stem cell core facilities, we feel to be on the right track.

The transfer of basic research ideas into industry remains one of the major challenges not just for us but for the whole scientific community in Austria. To tackle this issue, almost all academic institutions in Austria recently joint forces to establish a business concept for a Translational Research Centre (TRC) in Vienna. This institution shall bridge the gap between basic research and product development and create a sustainable ecosystem between academia and industry. We expect that in five years' time there will be a fully operational TRC that strongly interacts with all academic groups in Austria including IMBA and serves as a one-stop-shop for pharmaceutical industry and biomedical innovations made in Austria.

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