Péter Ferdinandy – President & Zsuzsanna Helyes – Secretary General, Hungarian Society for Experimental and Clinical Pharmacology (HUPHAR)



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Péter Ferdinandy and Zsuzsanna Helyes, President and Secretary General of the Hungarian Society for Experimental and Clinical Pharmacology (HUPHAR), share their insights about the role of the society, the R&D capabilities of the Hungarian pharmaceutical industry, the ability of local players to bring innovations to the market, and the future strategic direction of HUPHAR.

Can you introduce yourselves and the role of the Hungarian Society for Experimental and Clinical Pharmacology in Hungary?

Zsuzsanna Helyes: I am a medical doctor, a laboratory specialist and clinical pharmacologist from the University of Pécs, where I have worked for 25 years at the Department of Pharmacology and Pharmacotherapy. I am the president of the Szentágothai Research Centre that was established by our university in 2012. We have created an extensive research and innovation network with academic and industrial partners. My research team focuses on the mechanisms of inflammatory and pain conditions, sensory neuronal-immune-vascular interactions both at the periphery of and in the brain. We do exploratory research to identify novel targets for therapy, but also have two

ongoing drug development projects for chronic neuropathic pain that is an unmet medical need.

Péter Ferdinandy: I am also a medical doctor and clinical pharmacologist graduated at the University of Szeged. I am the head of the Department of Pharmacology and Pharmacotherapy and the vice rector of science and innovations of the Semmelweis University (Budapest). My cardiovascular pharmacology research group focuses on cardioprotection, specifically in relation to myocardial infarction and cardiovascular comorbidities. We are internationally respected opinion leaders in this field with an extensive international collaboration environment.

HUPHAR is an umbrella organization that targets pharmacological research and pharmaceutical industry in four main directions: experimental, clinical, teaching and innovation. This structure reflects a new strategy, the need to integrate multiple facets and adopt a network approach in pharmaceutical science and innovation. This structure and extensive collaborations have made HUPHAR stronger and internationally more competitive.

How would you describe Hungary's R&D capabilities for the pharmaceutical industry?

Péter: Hungary, as a pharmaceutical producer and an investment destination, is a regional leader. Investment in biomedical research and development has greatly increased in the last five years. Furthermore, pharmaceutical industry has a long-standing tradition here that spans over a century. During the Soviet era, Hungary was responsible for producing drugs, and became largely privatized after the political regime had changed. Large multinational companies bought their stake in the country, with Gedeon-Richter Plc. remaining the only multinational big pharma company with the headquarters in Hungary. There are small and medium-size enterprises that have sprung up over the last 20 years, and the next step is to promote vibrant start-up environment by building science parks. They will become hubs of cooperation between universities, biotech and pharmaceutical companies. Inadvertently, it would be a platform to reinvigorate this field with new players other than the usual multinational pharma companies.

What is the purpose of the "Medicine of the Year Award" and what is the selection criteria?

Péter: This award is a registered trademark of HUPHAR that is given every year to a pharmaceutical company. The aim of this award is to boost innovations in Hungary and create public awareness for pharma innovations. Furthermore, it is a great opportunity to highlight the

latest breakthrough achievements in research and development and the capabilities our country can offer.

Zsuzsanna: This is one of the most prestigious awards and pharmaceutical companies are always very honoured to receive it. The number of applicants varies, but each time it remains a difficult task to choose one awardee suggested by a professional evaluation committee of pharmacologists and expert clinicians in respective areas. The selection process is based on the innovative potential, the novelty of the mechanism of action or formulation, how it fulfils an unmet medical need, and the added value it can provide compared to other gold standard drugs in their fields of application.

This year, there were two awardees. How does it reflect the medical needs in Hungary?

Péter: This year we awarded Novartis for their drug called *Entresto* in cardiology and Janssen-Cilag for *Imbruvica* in haemato-oncology. Cancer patients in general have less than 50 percent survival rate, while cardiovascular diseases account for 48 percent of deaths: these are the two leading causes of mortality in Hungary. Hence, these are clearly the areas that require attention and have unmet medical needs. Through this award, we hope to bring more attention to these fields and motivate further development.

Zsuzsanna: This was the reason why this time HUPHAR exceptionally gave two awards, as both are leading drugs in their fields. The importance and innovative approach are reflected in the justification of the evaluation committee. The added value to existing therapies is one of the main points that is assessed, and these two drugs have clearly fulfilled this criteria.

How would you assess the ability of local players to bring innovations into the market?

Péter: Gedeon Richter Plc. can bring innovative products to the market. However, there is a gap between basic research and development, because there are few start-ups to bridge this distance. That is why Semmelweis University invests in a new Science Park to create an environment where the start-up culture is promoted. Currently, there are about 15 spin-off companies around Semmelweis University, and the aim is to increase this number to 100 and locate them in the Science Park. The idea is to give researchers a platform to attract investors, found new companies, and bring innovations to the market. To facilitate this, the internal innovation regulations were changed to make this process easier. Additionally, new courses are provided to nurture this new

mindset and approach. A solid scientific basis, large companies and investors have to be present in the ecosystem.

Zsuzsanna: The social and financial environment is definitely improving; companies increasingly use and foster academic research. Hungary is behind the European standards, but recently it has been catching up. There is a new tendency in the environment to adopt an open innovation approach. Companies have identified the potential of working together with universities, as a new way of promoting innovation. Universities can patent ideas, but require the support of industrial partners to start the commercialization process. For smaller companies, a network of potential partners is useful for pharmacological research and drug discovery. Hence, HUPHAR organizes conferences and platforms for basic researchers, clinicians and industrial experts to promote these interactions. There is a growing number of supporting members of HUPHAR, which are companies providing technologies and instruments for pharmacological research.

How does HUPHAR contribute to strengthening the pharmacology environment?

Zsuzsanna: Education is also an important mission of our society, as pharmacology is a complex subject. It is therefore important to have a consensus between the 4 medical schools (Semmelweis University in Budapest, Universities of Pécs, Szeged and Debrecen) both at graduate and post-graduate teaching levels. HUPHAR greatly contributes to these platforms by engaging students. The society extends the educational reach by trying to harmonize practices and standards within and outside Europe. It collaborates with several countries through the Federation of European Pharmacological Societies (EPHAR) and the International Union of Basic and Clinical Pharmacology (IUPHAR).

Péter: The society is also involved in coordinating the curricula of the 4 medical schools, and also in organizing Good Clinical Practice courses. HUPHAR is responsible for teaching and maintaining the clinical pharmacology specialization, which is a sub-speciality of the medical practice. In Hungary, the principal investigators and leaders of Phase I clinical centres need to be specialized clinical pharmacologists. This is a selling point and a unique attribute, which makes it attractive for pharmaceutical companies. Hence, remaining competitive in this field is very important for both our society and country.

Zsuzsanna: The society has a long-standing tradition of more than 57 years. Since then, it aims to cover the principles and practices of all fields of pharmacology and to incorporate the various clinical aspects. This way, HUPHAR is the body of reference for both experimental and clinical

pharmacology that provides standard quality for the whole environment. This approach is different in some other countries, as they often have multiple societies for experimental and clinical pharmacology, medicinal chemistry and pharmaceutical medicine.

What causes the reputational gap between Hungary's innovations output and recognition on a global scale?

Péter: Hungary may be still associated to the collapsed former Eastern block, which can explain this gap. However, this does not only affect Hungary, but the entire Central-Eastern European region. Nevertheless, this is an issue of visibility and recognition. It can be solved by intensive efforts in public relations, marketing and forming strategic partnerships. As an example, Semmelweis University is in the top one percent regarding internationalization and scientific output in the region. Over 30 percent of the gradual students in the medical, dentistry and pharmacy faculties come from more than 70 countries, there are English programs at all the 4 universities in these fields and German language teaching in 3 of them. The publication activity is remarkable, yet not sufficiently recognized.

What strategic direction are you looking to take pharmacology in Hungary?

Péter: The main goal of HUPHAR is to become a strong and prominent opinion leader in the region and on the international stage. We aim to solidify our local position in all fields of pharmacology, and through further international collaborations, increase our visibility, scientific, innovation and business impact in the region.

Zsuzsanna: Our other strategic objective is to link academic research and industry investments from biotech and pharma companies together. This would help the environment fulfil their development goals, but also enhance their innovative potential. By doing so, pharmacological research would improve allowing to discover novel drug candidates and to establish new therapeutic options. Inadvertently, this could bridge the innovation gap, and smaller companies could also contribute to pharmacological developments with their innovations.

What final message would you like to deliver on behalf of the society?

Our main mission is to strengthen the umbrella function of HUPHAR thereby strengthen pharmacology as a multidisciplinary field based on internationally outstanding research and innovation output. To achieve this, we have to have powerful pharmacology departments at the universities with excellent scientists and teachers, which provide strong pharmacology curricula for medical doctors, dentists, pharmacists, biotechnologists and medicinal chemists and related professions. A powerful society for experimental and clinical pharmacology including all the sub-sectors will attract a variety of clinical disciplines and industrial partners. Pharmaceutical innovation and development can only be substantially promoted this way.

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