



Integration of the GSCN into the BIH

Common goals – common paths

From 2020 onward, the German Stem Cell Network (GSCN) and the Berlin Institute of Health (BIH) will work together in partnership, with the BIH providing the GSCN with financial support. "From research comes health," is the BIH's pithy slogan. Its areas of focus include cell engineering and cell therapy – both areas that the GSCN has designated as priorities in recent years. With many goals in common, BIH board member Prof. Dr. Axel Radlach Pries and GSCN President Prof. Dr. Hartmut Geiger see large areas of overlap and the promise of a successful partnership. The interview was conducted by Stefanie Mahler.

GSCN annual magazine: What unites the Berlin Institute of Health (BIH) and the German Stem Cell Network (GSCN)?

Axel R. Pries: We are united by a shared interest in using science to improve health options for patients, and in prevention. The basic goal of our missions is very similar. Although the BIH is a local biomedical institute working in Berlin and the GSCN is a national network, we nonetheless pursue the same objectives. There is a large overlap between the BIH and the GSCN in our shared focus on cells as a mechanism for achieving translation into applications. Our strategic planning through to 2026 is based on translational hubs representing topics and technologies set to revolutionize medicine over the next few years. These include digitalization (at all levels), 'omics' and cells, cell engineering, organoids, and humanized animals for disease modeling and drug testing. In all of these research fields, our goals and approaches are very much in accord with those of the GSCN.

Hartmut Geiger: The GSCN and the BIH are tackling similar questions and have similar goals. How can I use organoids? How do I create an interface between organoids, single cell analysis and computer science? Are they suitable for disease modeling and drug testing? And how can this be used to create a cell therapy? Cell therapies are set to become increasingly common and increasingly well established. But developing a cell therapy is no simply matter – it's a very arduous process. If we can get past that, it's set to be a hugely successful field – that's apparent already from bone marrow transplantation, which is now more or less a standard treatment.

GSCN: Why is getting it to the bedside such an arduous process?

Axel R. Pries: Developing these therapies takes a very long time. This is hardly surprising. The reason cell therapy is such a complex undertaking is that cell behavior is very complex. Cells can multiply, they can change their appearance, they can change their behavior - with cells, anything can happen. It's very hard to predict how a cell is going to behave within a given system. Consequently it takes many years of intensive research.

Hartmut Geiger: A stem cell carries within it the full range of developmental potential for one tissue or organ. If we continue to conduct intensive research, as GSCN members and other researchers all over the world are currently doing, in theory we should one day be in a position to replace a single type of cell, cell system or even an entire organ. That may sound like a pipe dream, but if we look 20 or 30

Looking towards common goals and a good cooperation: Andreas Trumpp (left) and Hartmut Geiger (right) from the GSCN board with BIH chairman Axel R. Pries at the GSCN Annual Conference.

years into the future, in conjunction with developments in 3D printing, things are set to become very interesting. We will be able to develop these high potency cells in a highly selectively fashion in a Petri dish. This research and development requires scientific networks. As long as different people in different places are trying out different approaches to advancing this research and sharing their ideas via such networks, the goal of personalized cell therapy for patients is entirely credible.

Axel R. Pries: It is very clear that cell therapy poses entirely new challenges, both in terms of capacity and in terms of how we provide such therapies. Small molecule drugs can be patented. They can then be manufactured, packaged and placed on the market. Lots of patients can then be given the same drug, making provision of the drug financially viable. With cell therapy it's a whole new ball game. Treatments are not 'one size fits all'. Cell therapies will be personalized. Manufacturing them will be an enormous challenge, as will the payment model. How can we ensure that it doesn't become a medicine for the few? That's why we need intensive, widely diversified research that exploits the benefits that networks offer.

GSCN: What form will the partnership between the BIH and GSCN take?

Axel R. Pries: We are structured very differently. The BIH is a locally active scientific institute entering into a new relationship with the Charité. It is part of a local network rather than a standalone entity, but is nonetheless a scientific institution with long-term funding for specific roles. The stem cell network, by contrast, is a metastructure. All GSCN members work somewhere, they all have different

employers and have different institutions supporting them. So where do we overlap structurally? We are in a good position to offer each other mutual support. An organization like the stem cell network needs a comfortable, secure base. The GSCN can be confident of enjoying a beneficial long-term relationship with the BIH. That provides certainty. Federal funding means that the BIH is a strong, stable institution. That's going to be of major benefit to the GSCN.

Conversely, the GSCN can act as a kind of antenna for the BIH, picking up signals from the national and international stem cell scene and scouting out hot topics. The GSCN can then feed these kinds of information, contacts and opportunities to the BIH. This is likely to prove very significant and a big plus for science at the BIH.

Hartmut Geiger: The German Stem Cell Network boasts 14 working groups. Over the long term, we plan to intercalate BIH and GSCN working groups. We will build a shared knowledge platform to enable us to spot trends in the stem cell field, define a clear direction, identify blind alleys and best practices, and be quick to react. Our interests overlap strongly and our existing structures are complementary rather than in competition.

GSCN: How can we ensure that the GSCN continues to develop in a positive direction once it has been integrated with the BIH?

Axel R. Pries: It is very important to me that members of the network do not feel 'dominated'. This is an issue that we will not lose sight of. The BIH places high value on the GSCN's independence, diversity, and broad reach. The GSCN needs to be able to continue to work those internal

Max Planck Institute for Heart and Lung Research (MPI-HLR)

The Max Planck Institute for Heart and Lung Research, located in Bad Nauheim, investigates developmental processes of organs in the cardiovascular system and the lung.

A second focus is molecular and cellular processes during the formation of diseases in heart, blood vessels and lung, including remodeling processes in these organs. Scientists at the institute search for new approaches to support repair and regeneration of the affected organs.

The MPI closely cooperates with universities in Frankfurt, Gießen and Marburg. It has become a major part of various federal and state excellence initiatives and contributes to two "Gesundheitsforschungszentren".

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mechanisms that make it such a strong network. The GSCN manages to ensure that its members and conference delegates see themselves as partners, rather than competitors. That's very valuable. Everyone wants to get their paper published in a prestigious publication, but in science, the common ground you share means that you share information, and support, collaborate with, and respect each other. Even though you are also in competition, you nonetheless see yourself as a team. As a *major partner*, the BIH will benefit from its association with the GSCN, but without disrupting the network's sense of partnership or non-hierarchical structure.

Hartmut Geiger: We see things the same way. Our scientists are spread right across Germany, and we have established a platform that facilitates transparency, information sharing, and collaboration within the network. This works because we have a common goal – to develop knowledge and therapies using all of the capabilities offered by basic and applied research. The national and international stem cell research element that we bring to the BIH can only be conducive to the pursuit of these common goals. As a network, we offer the BIH, openness, positivity, esteem and appreciation and are looking forward to the future partnership and joint developments.



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