

Interview with Professor Christopher Baum

The BIH: An institute devoted to medical translation

Since October 2020, molecular biologist and medical doctor Professor Christopher Baum has led the Berlin Institute of Health (BIH), which at the turn of the year became the translational research unit of Charité – Universitätsmedizin Berlin. In the interview, he talks about his goals for the medical translation institute. In 2021, the BIH and the GSCN founded the joint “Dialog Platform Stem Cell Research” with the aim of networking stem cell research more effectively, both nationally and internationally, and accelerating the translation of research findings in this area. Stefanie Mahler conducted the interview.

GSCN: In terms of translation, on which areas will the BIH focus in the coming years?

Christopher Baum: We have just established three so-called Focus Areas: “Translational Vascular Biomedicine” concentrates on the small blood vessels that play a role in many common diseases like heart attacks, strokes, diabetes and kidney diseases. In the Focus Area “Regenerative Therapies” the emphasis is on the novel cell-based and gene therapy treatment options as used in, for exam-

ple, immunotherapies. But we also want to leverage the body’s own regeneration processes, such as in patients with acute or chronic degenerative diseases. And the third Focus Area, “Single Cell Approaches for Personalized Medicine,” deals with novel single cell technologies and their clinical applications. We have just recruited four young junior group leaders in this area, each of whom works closely with a Charité clinician for the purpose of actually developing the technologies for the benefit of patients. Stem cell-based approaches are of key importance for all three Focus Areas.

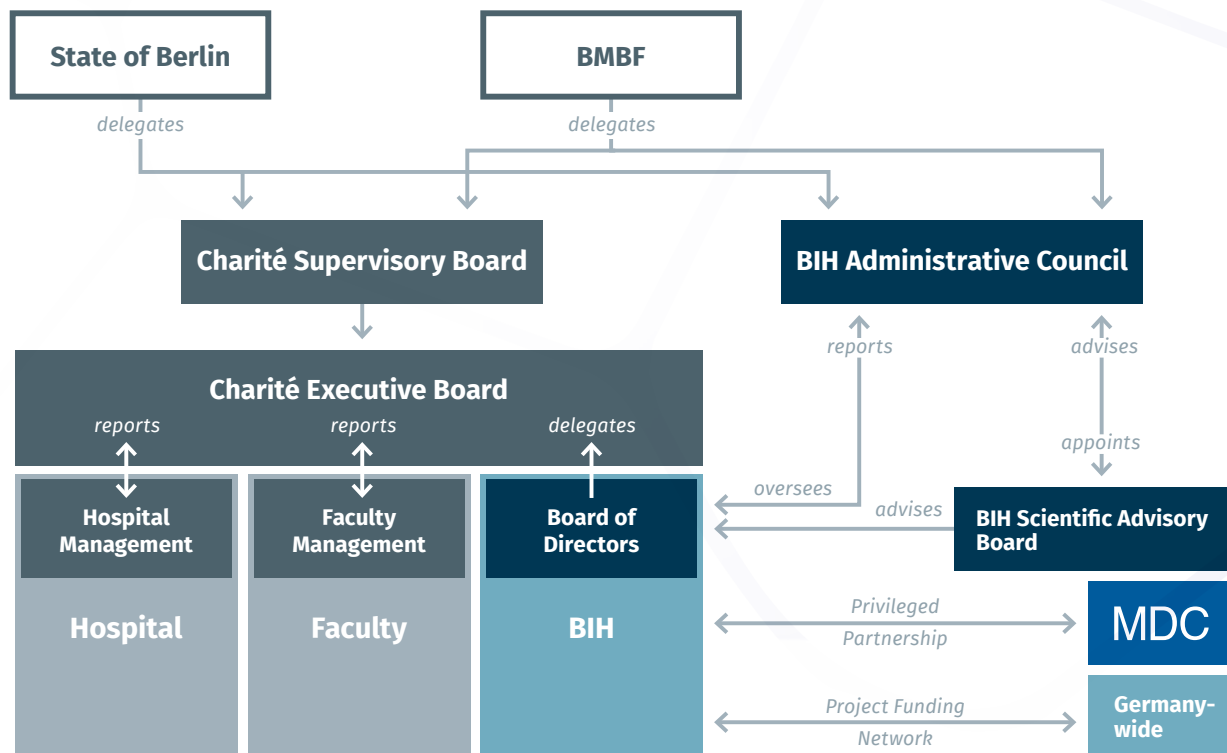
Moreover, the BIH has focused intensely on the digitalization of medicine since the outset. We develop and provide tools which make it possible to take full advantage of the enormous volume of data from biomedical research and clinical practice, obviously taking into account data protection issues. We also extract information from medical data for personalized therapy ourselves. And in the scope of the Digital Health Accelerator program, we support scientists and doctors who wish to put their digital health solutions into actual practice.

Prof. Christopher Baum

Chair of the BIH Board of Directors and Chief Translational Research Officer of Charité – Universitätsmedizin Berlin

Prof. Dr. med. Christopher Baum was born in 1962 in Marburg and studied philosophy (2 semesters in Mainz) and medicine in Essen, Freiburg and Hamburg. He received his doctorate (Dr. med.) in 1991 and habilitated in molecular medicine at the University of Hamburg in 1999. In the year 2000, he accepted a professorship in stem cell biology at the Hannover Medical School (MHH) and at the same time was associate professor of pediatrics at the Cincinnati Children’s Hospital in the USA. In Hannover, from 2006, he headed the Institute for Experimental Hematology, served as Ombudsperson for Good Scientific Practice and as Dean of Research, and in 2013 was elected President of the Hannover Medical School (MHH). In early 2019, Baum moved to the University of Lübeck as the first full-time vice president of medicine and board member of UKSH, Germany’s second-largest university hospital after Charité. Since October 2020, Christopher Baum has been chairman of the board of the Berlin Institute of Health (BIH). Scientifically, Christopher Baum became involved with gene therapy at an early stage. He developed gene vectors to insert genes into blood stem cells and uncovered the basics of the mutagenesis in gene therapy, which leads to blood cancer in patients treated with gene therapy. Based on this, he developed test methods to detect dangerous side effect before the transfer of the genetically modified blood stem cells.





Where would you like to see the BIH in five years; what goals would you like to achieve by then?

We would like to be perceived throughout Germany as an indispensable institute for medical translation. We are currently testing innovative instruments for promoting translational career and project development in the Berlin research environment. A key action area is the evaluation of translational projects: Is a project truly based on sufficiently reproducible research results? How great is the medical need and the anticipated benefit for patients? Have all regulatory aspects been considered and are all skills available in-house or in a suitable network? Any medically promising discovery must address such questions in the laboratory before further steps toward application and promotion are taken. But it goes without saying that the actual implementation of the first translational projects in five years, whether in the form of new diagnostic techniques, new treatment options or digital solutions that truly help patients, is also our goal.

What specific tasks in translation does the BIH hope to accomplish in the area of regenerative medicine (BIH Regeneration)? What will be the role of the technologies from stem cell research here?

One way in which the technologies from stem cell research are used in this area is the development of organoids, on which important research on the causes of or treatment options for diseases can be conducted – neurological diseases are an example. This includes novel techniques based on human cells, which should make it possible to reduce the number of animal experiments in research. Stem cell technologies are also used in the propagation, genetic modification and differentiation of autologous cells before the latter are given back to a patient. To this end, in Berlin we are pursuing projects in, for example, hematology, immunology and on the musculoskeletal system. And obviously our colleagues in the Single Cell Focus Area are also working with stem cell technologies, for instance when searching

BIH Center for Regenerative Therapies (BCRT)

The BIH Center for Regenerative Therapies (BCRT) was established as an interdisciplinary translational center with the goal of enhancing endogenous regeneration by cells, biomaterials, and factors which can be used to develop and implement innovative therapies and products. At the BCRT clinicians and researchers are working closely together on the medicine of the future: targeted, personalized medicine that depends on the early recognition of patients' individual healing potential. The primary focus of the BCRT is on diseases of the immune system, the musculoskel-

etal system, and the cardiovascular system supported by the interdisciplinary fields of tissue homeostasis & cachexia and molecular analysis/rare diseases for which currently unsatisfactory treatment options are available. According to our results, the analysis and control of inflammation/immunity plays a key role in the successful restoration of tissue homeostasis. Early cooperation with industry, health insurers and regulatory authorities as well as other external partners boosts the chances of innovation and exploitation of the new methods and provides access to flexible financing options.

BIH Regeneration

BIH Center for Regenerative Therapies (BCRT)



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www.bihealth.org/de/regeneration

Photo: Peer Schröder

for the “cell of origin” (i.e. the cause of a disease) or testing cell products for homogeneity.

Thanks to the German Stem Cell Network (GSCN), the BIH is now more involved in the German stem cell research scene – what hopes and what expectations do you see in this?

We are very excited about this cooperation. First of all, we are gaining a partner that is already networked throughout Germany, which also helps us to expand our network beyond Berlin. Secondly, we hope to have fruitful cooperation activities in the field of stem cell research in our own scientific units. And thirdly, GSCN stem cell researchers themselves may be interested in translating their findings into patient applications, and we would gladly assist them in doing so. Also, the BIH translational instruments specifically address complex medical products and should therefore be well suited for stem cell-based treatment methods.

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