A special biobank for neurological research

Over the last few years, the Hertie Institute for Clinical Brain Research in Tübingen has established a comprehensive biobank for use in neurological research. The databank is available to scientists from research institutions and companies working on research into neurological diseases such as Parkinson’s and Alzheimer’s with the aim of finding new options for the diagnostics and therapy of such diseases.

PD Dr. Walter Mätzler is coordinator and scientific director of the biobank and has been involved in its establishment since 2003. “We realized the importance of having access to a pool of high-quality samples for brain research. Over the last few years, we have increasingly professionalized the biobank. For the last five years or so, we have had access to a high-quality and well structured biobank.” It requires a lot of work and time to maintain high quality standards, and this is associated with high personnel and equipment costs. The Hertie Institute together with the Department of Neurology at the University Hospital of Tübingen and the German Centre for Neurodegenerative Diseases (DZNE) together cover all running costs. By providing the necessary financing, the partners guarantee the continuation and future expansion of the biobank. Most, but not all, of the samples come from patients in the Department of Neurology. “Cooperations with other partners and multicentre studies also provide us with samples from other centres in Germany and abroad. We store these samples and can also use them for our research if stipulated in the contracts we sign with our respective partners,” said Mätzler.

The biobank also collects samples obtained in cohort studies such as the TREND study, which collects data as well as DNA, serum and plasma from the blood samples of men and women aged between 50 and 80 who were found to be in good neurological health at the time of the initial examination (this cohort study is led by Prof. Daniela Berg). The aim of the “Tübingen collection of risk factors for the detection of neurodegeneration” study is to identify risk factors for neurodegenerative diseases. The study involves 1,200 people who are examined at two-year intervals. Longitudinal studies such as TREND provide valuable material for observing the progression of diseases. In addition, the researchers are also interested in obtaining insights into the influence of a person’s genetic material on the risk of developing neurodegenerative diseases, which is why the biobank also collects and administers biomaterial from patients with genetic neurodegenerative diseases.

The biobank mainly collects body fluids such as blood, urine and cerebrospinal fluid as well as cells obtained from skin punches. At present, the collection comprises 100,000 sample tubes. Mätzler: “We have around 20,000 tubes with DNA samples and around 4,000 with blood samples. With around 150 samples, skin punches represent the smallest collection.” Mätzler, who is a specialist in neurology, also uses the biobank for his research projects. As part of cross-sectional and longitudinal studies, he is specifically focused on similarities between Alzheimer’s and Parkinson’s. He is mainly interested in pathophysiological aspects. Such sophisticated projects depend on high-quality samples from well-characterized donors.

Reducing the time from donor to science lab

Website address:
Mätzler believes that the biobank at the Hertie Institute is unique as far as the high quality of the samples is concerned. "It often takes quite a long time before a patient sample is actually stored in a biobank. This compromises the quality of the samples, as does the use of wrong sample tubes. This is not the case in Tübingen. We have optimized all the processes so that it only takes around an hour to transfer a newly removed patient sample into a freezer. We also provide advice on such issues to the partners that we work with in multicentre studies." The fact that Mätzler and his team invest a lot of time and effort in the quality-optimized processes pays off in high-quality research results.

Not all donors benefit equally from the research findings arising from such a collection. However, Mätzler knows from his own experience that even the patients who benefit the least are very interested in the progress that is made possible thanks to their contributions. "We make a huge effort to include the donors of the samples in our research. They are part of our research on different levels. For the future, we are developing concepts that use modern Internet tools to provide donors with up-to-date information about our research results and to inform them about and recruit them for research for which data has not yet been acquired."

This said, the safety and protection of data and patients has priority. The researchers from Tübingen have developed a data protection concept and also report...
all processes to the ethics commission. In addition, the ethics commission gives or denies approval for the use of samples. Mätzler and his team have had no problem with safety issues so far, either internally or related to donors. In addition, no donor has so far withdrawn his or her consent for the storage and use of his or her sample. Donors have the permanent option to withdraw their consent, in which case all samples they have donated will be destroyed.
Biobank access is also granted to industrial researchers

In addition to the neurological researchers from Tübingen, access to the biobank is in principle given to any interested scientist who can prove his or her need to use such samples. All decisions are taken by the institute’s approval commission, which assesses the quality of individual research projects. “If it is a good quality project, we will deny access to our samples only in cases where the particular project overlaps in a number of aspects with our own projects,” Mätzler said also explaining that material can be given to cooperation partners at cost price. Contract research activities involving biobank samples must of course be paid for.

As the amount of biomaterial per sample is limited, too many sample requests might theoretically lead to bottlenecks. However, Mätzler is not too worried about this. “At the moment we collect far more samples than we remove from the biobank. We can also obtain several samples from one person if necessary. In addition, we continuously recruit new volunteers who are willing to donate samples. This allows us to expand our biobank efficiently,” Mätzler said.

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