

REPORT

3rd HUPO Brain Proteome Project Workshop promises successful pilot studies

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For the HUPO Brain Proteome Project (HUPO BPP, www.hbpp.org), the year 2004 was dedicated to the settlement of the organizational structures as well as to the realization of the pilot studies. Two studies were initiated and almost accomplished by the end of 2004:

- i) Human Brain Proteome Pilot Study: differential comparison of the proteome of the “living brain” (biopsy surgery) with autopsy “Brain Bank” tissue in an international and independent analysis. This will give insight into the post mortem protein stability, contribute to the normal human brain proteome database and hopefully lead to marker proteins used in quality control of (Brain Bank) brain tissues. The study will reveal the technical portfolio of the participating groups for future, standardized disease-specific studies. The tissues are kindly provided by Albert Becker, Bonn (biopsy) and Hans Kretzschmar, Munich (autopsy).
- ii) Mouse Brain Proteome Pilot Study: differential comparison of the mouse brain proteome subject to development. With the proteome analysis of the brain of three different developmental stages of the common and well characterized inbred mouse strain C57Bl/6, kindly provided by Gert Lubec, Vienna (E16, P7, 8 weeks; shipment costs kindly accepted by Applied Biosystems), a first step has been made towards a reliable database of definite mouse brain proteome and towards the understanding of the changes the proteome undergoes during aging, thus helping to define the “normal”.

Different groups from Belgium, China, Germany, Hungary, South Korea, Switzerland, the UK as well as the US agreed to participate in the studies and met at the 3rd HUPO Brain Proteome Project Workshop at Castle Rauischholzhausen near Giessen, Germany, from December 15 to 16, 2004 in

order to present the preliminary results of their analyses and to discuss next steps.

Update and results

In a welcome address, the coordinator Helmut E. Meyer (Medical Proteom-Center (MPC), Ruhr-University Bochum, Germany) provided a short overview of the HUPO BPP achievements and developments in 2004. Among others, he informed the attendees that the BPP project was affirmed as a HUPO project during the Beijing conference and that a worldwide network of interested colleagues could be recruited resulting in numerous meetings and courses.

Subsequently, Helmut E. Meyer/Katrin Marcus (MPC), Debora Dumont/Johan Robben (Limburgs Universitair Centrum, Belgium), Michael Fountoulakis (Foundation for Biomedical Research of the Academy of Athens, Greece), Georg Arnold/Thomas Fröhlich (Ludwig-Maximilian University Munich, Germany), Claus Hultschig (MPI Molecular Genetics, Berlin, Germany), Rüdiger Hess/Michael Schrader (Bio-VisioN AG, Hannover, Germany) and Young Mok Park (Korea Basic Science Institute, Daejeon, South-Korea) presented their promising results. Thorough data analysis is not finished now; and validated results will not be available until mid-2005. The methods applied ranged from mRNA profiling, 2-D gel electrophoreses to mass spectrometry. Raw data will be submitted to a Data Collection Center (DCC) using the software ProteinScape (Bruker Daltonics, Bremen, Germany & Protagen AG, Dortmund, Germany) as a common platform and finally re-analyzed by independent colleagues.

Data Collection Center (DCC) strategy and reanalysis

In an overall explanation, the database strategy of the chosen export/import model for the database software ProteinScape in the HUPO BPP was described by Christian Stephan, MPC Bochum. The data export tool is ready and very easy to use for all participants. Participants using ProteinScape were provided with the export module *via* CD ROM.

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A pretended structure for all acquired data will automatically be implemented together with the export module installation.

The export of data from participants not using ProteinScape will be organized individually. The participants were reminded to get in contact with the MPC in Bochum to submit their data directly after finishing the pilot study to the DCC at Bochum for the central reprocessing and the additional data analysis, as the import module for ProteinScape is also ready.

Philip Jones (European Bioinformatics Institute (EBI), Hinxton UK) informed the audience about the reprocessing strategy that has been elaborated by the HUPO BPP bioinformatics committee in collaboration with the HUPO Proteome Standardization Initiative (HUPO PSI). It has been decided to use version 3.00 (Nov. 2004) of the IPI-database of human and mouse for data reprocessing. It was shown that extensive analysis of the data is planned, *e.g.*, comparison of results between different labs, between human and mouse brain, as well as between the different HUPO Proteome Projects (plasma, liver *etc.*). To realize this, a database for all HUPO Proteome Projects will be established by the EBI, based on the PRIDE database. Concerning the publication of the HUPO BPP pilot studies, it was assumed that all analysis will be done by different voluntary task forces and will be cumulatively published in one major journal.

At the beginning of the bioinformatics-standardization discussion, Lennart Martens (University of Ghent, Belgium) showed in a short presentation the aims of the different HUPO Projects and in more detail the achievements as well as known pitfalls of the HUPO Plasma Proteome Project (PPP). He described the possibility to learn from these pitfalls and how the BPP can set some clear milestones to avoid

them. Lennart Martens pointed out that the great advantage of the HUPO BPP is the easy way of collecting data in one standardized format with ProteinScape. In addition, a good start was done with the standardized and high numerated samples within the pilot studies. The open discussion led to the appointment of necessary contacts between the groups and the bioinformatics of the BPP.

New projects and next steps

In the last part of the session, the up-coming activities of the HUPO BPP were addressed. Jens Wiltfang and Piotr Lewczuk (Erlangen-Nuremberg, Germany) initiated the new project “Clinical Neuroproteomics in Human Body Fluids” aimed at the non-quantitative identification of brain derived proteins in human body fluids (control individuals and mild cognition impairment patients). In the start, these fluids are provided by the CompetenceNet Dementia, Germany, and are well characterized (according to guidelines by Wiltfang & Lewczuk). In addition, it was discussed that the 1st International HUPO BPP Mouse Model Workshop will take place during the 4th Dutch Endo-Neuro-Psycho Meeting in Doorwerth, NL, at June 1, 2005. This workshop will deal with the question of which neurodegenerative mouse models are suitable and available for the HUPO BPP master phase. More details will be available soon at www.hbpp.org.

The 3rd HUPO BPP workshop closed with an overall contentedness, but with the general homework requests to elaborate appropriate strategies following the identification of proteins and protein patterns.

Parts of the German activities within the HUPO BPP are funded by the German Ministry of Education and Research (BMBF).

