

## Report

# “Does understanding the brain need proteomics and does understanding proteomics need brains?” – Second HUPO HBPP Workshop hosted in Paris

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The second Human Brain Proteome Project (HBPP) Workshop of the Human Proteome Organisation (HUPO) took place at the Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI) from April 23–24, 2004. During two days, more than 70 attendees from Europe, Asia and the US came together to decide basic strategic approaches, standards and the beginning of a pilot phase prior to further studies of the human brain proteome. The international consortium presented the technological and scientific portfolio and scheduled the time table for the next year.

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The Human Proteome Organisation HUPO was established some three years ago with the overall aim of analysing the human proteome. To handle this huge challenge, different projects were launched focusing on distinct human organs, namely the Human Plasma Proteome Project (HPPP) organized by US-American colleagues, the Human Liver Proteome Project (HLPP) under Chinese organization and the Human Brain Proteome Project (HBPP) by German scientists. Within the following months the initiatives identified interested key persons, techniques and strategies, obviously condensing to critical workable masses.

This essential step has been taken by the HBPP initiative with the 2<sup>nd</sup> HUPO HBPP Workshop that took place at the Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI) from April 23–24, 2004, locally organized superbly by Prof. Jean Rossier. During two days, more than 70 attendees from Europe, Asia and the US came together to decide basic strategic approaches, standards and the beginning of a pilot phase prior to further studies.

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In general it was stated that this project will track the following goals:

### Vision

Towards an understanding of the pathological processes of the Brain Proteome in Neurodegenerative Diseases and Aging.

### Mission

The HUPO Human Brain Proteome Project is an open, international scientific initiative under the umbrella of HUPO (Human Proteome Organisation). The consortium welcomes all adequate groups and laboratories that are willing to contribute to the goals of HUPO HBPP. These goals are:

- Defining and deciphering the normal brain proteome including polymorphisms, modifications, histological localization as well as identification of brain derived proteins in bodily fluids.
- Correlation of the expression pattern of brain proteins and mRNA.
- Identification of disease-related proteins involved in

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\* Title of the lecture given by Peter Roepstorff.



neurodegenerative diseases and aging by differential protein expression profiling and by techniques and methods available within the participating groups.

- Validation and functional characterization of these proteins by techniques and methods available within the participating groups leading to biomarkers for diagnosis and therapeutic targets.

- The focus will be on Alzheimer's Disease (AD including Down-Syndrome), Parkinson's Disease (PD) and Aging including corresponding mouse models. However, the elucidation of other neurodegenerative diseases is no less important and can be part of the HUPO HBPP scientific program.

- Besides scientific research the establishment of Training and Education programs to inform the public as well as to propagate techniques and methods used in proteomic research is another important part of the HBPP work.

- Set up of a neuroproteomic data base accessible to all participating laboratories and the scientific community.

With regard to the above mentioned goals, the workshop participants divided up into four committees Executive, Specimen Collection and Handling, Technology Platforms and Standardization, and Database and Bioinformatics. The needs of the special fields were elucidated and afterwards presented to the whole consortium. In general, the so-called master plan was established, determining the overall aims and approaches. Brain areas and mouse models were defined, including acquisition and distribution. Moreover, needed and available technologies were

elucidated, Standard Operation Procedures were discussed and strategies of data collection and formats were designed (World Neuroproteome Database), throughout in consensus with other HUPO initiatives, e.g. the HUPO Proteomics Standards Initiative (HUPO PSI).

On the second day, the HUPO HBPP pilot phase was presented by the participants. Two pilot studies have been launched just before the workshop:

1. Proteome analysis of normal mouse brain (3 different developmental stages) in order to
  - a) Assess of the quality of 2-D and non 2-D gel based quantitative proteome analysis
  - b) Feed the brain proteome database with reliable data
  - c) Compare proteome and transcriptome by performing mRNA profiling
2. Proteome analysis of human brain from biopsies and autopsies in order to
  - a) Assess protein stability in *post mortem* tissue
  - b) Feed the brain proteome database with reliable data

Both studies will reveal the technical portfolio of the participating laboratories and lead to standardized data formats and submissions. This is eased by the circumstance that most participants agreed to install the ProteinScape™ software (free licenses sponsored by Bruker Daltonik, Germany) for handling mass spectrometry data. Attendees briefly introduced themselves and their analysis strategy, offering multiple interaction possibilities.

In addition, two excellent lectures were given by Peter Roepstorff “Does understanding the brain need proteomics and does understanding of proteomics need brains?” and Michael Harrington “Mass spec strategies to explore protein composition of human CSF”, resulting in fruitful discussions. Conversation was continued at the social event, a marvellous boat trip on the river Seine accompanied by live classical music and a superb dinner.

The 2<sup>nd</sup> HUPO HBPP Workshop closed with the following schedule:

April 26–27, 2004

ProteinScape course for HUPO HBPP pilot studies participants at the Medical Proteom-Center, Bochum, Germany

October 23, 2004

HBPP Session at the 3<sup>rd</sup> HUPO World Congress in Beijing ([www.hupo2004.cn](http://www.hupo2004.cn))

December 15–16, 2004

3<sup>rd</sup> HUPO HBPP Workshop at Castle Rauischholzhausen, Germany

August 8–12, 2005

4<sup>th</sup> HUPO HBPP Workshop at the 9<sup>th</sup> International Congress on Amino Acids and Proteins in Vienna

End of 2005

5<sup>th</sup> HUPO HBPP Workshop in Dublin

For additional information and updates, please visit [www.hbpp.org](http://www.hbpp.org) and [www.hupo.org](http://www.hupo.org) or directly contact [Michael.Hamacher@rub.de](mailto:Michael.Hamacher@rub.de).

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