Executive Summary

The ESF EMRC Exploratory Workshop ‘The Brain as a target for inflammatory processes’ took place from 07-09 September 2006 at Inselhotel Potsdam-Hermannswerder, where the participants of the workshop also were accommodated.

16 Scientists from 6 different countries took part in presentations and discussions. Additional 6 scientists completed as chairs and discussion partners the workshop. Since the meeting site was on a peninsula with a very rural character the participants stayed together the entire time and had little opportunity to escape this community. This also included common meals, common meetings in the evening after the sessions and one common excursion. This structure led to intense discussions since the meeting had the typical retreat character.

The Workshop started Thursday afternoon at 15:00 and finished on Saturday at 12:00. The presentations were usually for 20 min. We sometimes had questions during the talk but commonly we had an intense discussion after each presentation. Since the program was not too tight we sometimes run a bit over time since many topics were heavily discussed. As we stated in the application and as it is also evident from the program the main topic was the brain as target for inflammatory processes. One focus certainly was multiple sclerosis and the cellular and molecular consequences.

The scientific part of the meeting was preceeded by a presentation of the European Science Foundation given by Monika Bradl, Austria. She clearly explained the goals of the ESF, their possibilities for the European science community and potential ways
of funding. We also had changes in the program: We had one replacement, namely Adriano Fontana’s co-worker Ursula Malipiero, Suisse, presented the work of this research group. Unfortunately, both Adriano Aguzzi, Suisse, and Roger Nitsch, Suisse, got both stuck in a plane from Zurich on Friday morning. Since there was a serious departure problem in Zurich they could not make it to the meeting but contacted us and apologized.

At the end of the meeting we had an intense round table discussion how we could foster our interactions and in particular about the options of creating a European network on the topic of inflammatory processes of the brain. We all agreed that it would be a timely effort and we decided to explore the possibilities as one of our future goals. Helmut Kettenmann, Germany, got the mandate of the group to explore possibilities in Bruxelles and inform the group.

Scientific content
The main theme was to discuss molecular and cellular mechanisms of inflammatory processes in the central nervous system. We had been focusing both on basic cellular mechanisms and on disease-related questions. The meeting started with mechanisms triggered by bacterial meningitis presented by Ursula Malipiero, Suisse, and A. Marceline van Furth, Netherlands, chaired by Jörg Weber, Germany. The next section focused on mechanisms in multiple sclerosis. There Wolfgang Brück, Germany, was alluding on the interplay between inflammation and degeneration while Christine Dijkstra, Netherlands, was discussing the role of macrophages and axonal loss in this disease state. The session was chaired by Frauke Zipp, Germany. On Friday we started to discuss mechanisms of cross-talk between nerve and immune cells. Bente Finsen, Denmark, reported on fate of microglial cells in acute and chronic central nervous system pathology while Hugh Perry, UK, discussed the impact of a systemic inflammation. Robin Franklin, also from the UK, reported on his findings how precursor cells in the CNS are affected by inflammation. The chapter chaired by Harald Neumann, Germany, was focusing on specific molecules important in inflammation. Nancy Rothwell, UK, discussed the role of Interleukin-1 and also its potential as a therapeutic target while Krzysztof Selmaj, Poland, discussed the role of stress-induces proteins in the inflammatory process. In the last talk on Friday Ulrich Dirnagl, Germany, discussed inflammatory mechanisms which become evident in the late phase of stroke while Burkhard Becher, Suisse, discussed the role of T-cells and
the interactions with the intrinsic brain cells. On Saturday Gennadij Raivich, UK, discussed the neuroimmune surveillance while Jennifer Pocock, UK, was focusing on glutamate receptors in microglial cells which seem to play a very important role in neurodegeneration and in the interaction of microglia in particular with neurons. The last talks were given by Hartmut Wekerle, Germany, about the auto-immune milieu and finally by Frank Heppner, Suisse, reported on the development of a new animal model to paralyze microglia and, thus, determining the role of these cells in inflammatory and pathologic processes.

**Outcome**

This meeting manifested existing interactions and collaborations. Moreover, new collaborations were discussed and organized. I can report for myself that I have newly launched two collaborations during this workshop.

As already alluded in the Executive Summary we had an intense discussion about plans for further research and common consortia. While there were mutual interactions between participants we also thought about a general strategy to implement this theme as a European network program. With this goal in mind we departed.
Final Programme

Time for each speaker is 30 minutes (20 minutes presentation and afterwards 10 minutes discussion).

Thursday 7 September 2006

Morning

Arrival
15.00

Introduction

Presentation of the European Science Foundation (ESF)
Monika Bradl (Standing Committee for European Medical Research Councils)

Acute neuroinflammation of the CNS

Chair: Jörg Weber

15.30 - 16.30

Adriano Fontana, Switzerland substitute: Ursula Malipiero
On the role of transforming growth factor beta in bacterial meningitis
A. Marceline van Furth, The Netherlands
Pathophysiological aspects of bacterial meningitis

16.30 - 17.00

Break

Chronic neuroinflammation of the CNS

Chairs: Frauke Zipp

17.00 - 18.00

Wolfgang Brück, Germany
Inflammation and degeneration in multiple sclerosis

Christine D. Dijkstra, The Netherlands
Macrophages and axonal loss in multiple sclerosis

18.30

Shuttle to Park Sanssouci

19.00-20.00

Guided Tour Park Sanssouci

20.00 - 22.00

Dinner (Krongut Bornstedt)

Friday 8 September 2006

Crosstalk of the nervous and the immune system

Chairs: Christine Stadelmann/Robert Nitsch

09.30 - 11.00

Bente Finsen, Denmark
Inflammation in acute and chronic CNS pathology

Victor Hugh Perry, United Kingdom
Impact of systemic inflammation on the brain in health and disease

Robin Franklin, United Kingdom
Inflammation of precursor activation - a critical step in remyelination

11.00 - 11.30

Break
Molecular mechanisms in neuroinflammation and neurodegeneration

Chair: Harald Neumann

11.30 - 12.30

Nancy Rothwell, United Kingdom
Interleukin-1 as a therapeutic target in CNS

Krzysztof Selmaj, Poland
The role of stress-induced proteins (hsp90) in regulation of autoimmunity within CNS

12.30 - 14.30

Lunch

Secondary neuroinflammation

Chair: Mathias Bähr

14.30 - 16.00

Adriano Aguzzi, Switzerland
Immunobiology of prion diseases

Ulrich Dirnagl, Germany
Inflammatory and immune responses in stroke

Roger Nitsch, Switzerland
Immunotherapy of Alzheimer’s Disease

16.00 - 16.15

Break

16.15 - 17.45

Discussion about plans for follow-up research activities and collaborative actions

18.30 - 20.30

Dinner

Saturday 9 September 2006

Role and function of immune cells within the CNS

Chair: Helmut Kettenmann/Ralf Gold

09.00 - 10.30

Burkhard Becher, Switzerland
Autoaggressive T Cells in the CNS: Pathogenicity genes and broken paradigms

Gennadij Raivich, United Kingdom
Neuroimmune surveillance: chemical signals and their effects on the neurodegenerative process

Jennifer Pocock, United Kingdom
Microglial glutamate receptors; switching off toxicity

10.30 - 11.00

Break

11.00 - 12.00

Hartmut Wekerle, Germany
(Auto-)Immune milieus before and within the central nervous system

Frank Heppner, Switzerland
Microglial paralysis in vivo

12.00 -12.30

Closing remarks

Afternoon

Departure
Final List of Participants

**Convenor:**
1. Helmut KETTENMANN  
   Max-Delbrück-Zentrum für Molekulare Medizin  
   Zelluläre Neurowissenschaften Abteilung  
   Germany

**Co-Convenors:**
2. Joerg WEBER  
   Neurologische Klinik  
   Universitätsklinikum Charité  
   Humboldt University Berlin  
   Germany
3. Frauke ZIPP  
   Charité Campus Virchow  
   Neuroscience Research Center  
   Department of Neuroimmunology  
   Humboldt University Berlin  
   Germany

**Organiser:**
4. Stefanie KORTHALS  
   Max-Delbrück-Zentrum für Molekulare Medizin  
   Office ESF Workshop  
   Germany

**ESF Representative:**
5. Monika BRADL  
   Medical University Vienna  
   Department of neuroimmunology  
   Austria

**Participants:**
6. Mathias BÄHR  
   Universitätsklinik Göttingen  
   Germany
7. Burkhard BECHER  
   Neurologische Klinik  
   Universitätsspital Zürich  
   Switzerland
8. Wolfgang BRUECK  
   Institut für Neuropathologie  
   Georg-August-Universität Göttingen  
   Switzerland
9. Christine DIJKSTRA  
   Molecular Cell Biology  
   VU Medical Center  
   Netherlands
10. Ulrich DIRNAGL  
    Neurologische Klinik  
    Charité - Universitätsmedizin Berlin  
    Germany
11. Bente FINSEN  
    Anatomy and Neurobiology  
    Odense University  
    Denmark
12. Ursula Malipiero  
    Clinical Immunology  
    Internal Medicine  
    Unispital Zürich  
    Switzerland
13. Robin FRANKLIN  
    Department of Clinical Veterinary Medicine  
    University of Cambridge  
    United Kingdom
14. Frank HEPPNER  
    Institute of Neuropathology  
    University Hospital Zurich  
    Switzerland
15. Victor Hugh PERRY  
    School of Biological Science  
    University of Southampton  
    United Kingdom
16. Jennifer POCOCK  
    Dept. of Neurochemistry  
    Institute of Neurology  
    Univ. College London  
    United Kingdom
17. Gennadij RAIVICH  
    Dept. of Obstetrics and Gynaecology  
    University College London  
    United Kingdom
18. Nancy ROTHWELL  
    School of Biological Sciences  
    University of Manchester  
    United Kingdom
19. Krysztof SELMAJ  
    Department of Neurology  
    Medical University of Lodz  
    Poland
20. A. Marceline VAN FURTH  
    Department of Pediatrics  
    VU Medical Center  
    Netherlands
21. Hartmut WEKERLE  
    MPI für Neurobiologie  
    Germany
Statistics on Participation

Total number of participants including convenors (3): 20

Age distribution:

The age bracket was between 30 and 55 years.

Gender distribution:

Female: 6      Male: 14

Geographical distribution:

Austria     1
Denmark     1
Germany     7
Netherlands 2
Poland      1
Switzerland 4
United Kingdom 5