

Development of Biomarker-protein chips for the diagnosis of neurodegenerative disorders

Eckhard Nordhoff¹, Miriam Böckmann¹, Caroline May¹, Kathrin Barlog¹, Stephanie Tautges¹, Isabell Fuchs¹, Michael Turewicz¹, Christian Stephan¹, Dirk Voitalla², Beate Pesch³, Axel Kowald⁴, Lea Tenenberg Grinberg⁵, Manfred Gerlach⁶, Peter Riederer⁶, Heike Göhler⁴, Helmut E. Meyer¹

¹ Medizinisches Proteom-Center, Ruhr-University Bochum, Germany

² Neurologische Universitätsklinik der Ruhr-Universität Bochum, St. Josef Hospital, Germany

³ Institut für Prävention und Arbeitsmedizin der Deutschen Gesetzlichen Unfallversicherung, Institut der Ruhr-University Bochum, Germany

⁴ Protagen AG, Dortmund, Germany

⁵ Dept. of Pathology – University of São Paulo Medical School, Brazil

⁶ Clinical Neurochemistry (National Parkinson Foundation Center of Excellence Research Laboratory), Department of Psychiatry and Psychotherapy, University of Würzburg, Germany

The diagnosis of neurodegenerative disorders such as Parkinson or Alzheimer disease relies on the recognition of clinical symptoms appearing in a late stage of pathogenesis. Our joint efforts aim at the identification of specific molecular markers allowing an unambiguous and early diagnosis based on a simple blood test.

Following the hypothesis that autoimmune reactions play a crucial role in the development and progression of many, if not all neurodegenerative disorders, we have developed a proteinarray-based screening strategy for the discovery of disorder specific protein-autoantigenes. It takes into account the enormous complexity and variability of both, the target disorders as well as the individual autoantibody repertoires. If successful, these proteins will be used for the detection of disorder-specific autoantibodies in human blood samples.

The strategy will be described and important aspects of it discussed, especially the collection of relevant clinical and patient data, blood samples, their preparation, biobanking as well as the following analyses, bioinformatics and validation work.