

Plasma and cerebrospinal fluid profiling for HIV-associated neurocognitive disorders

Pawel Ciborowski¹, G. Pottiez¹, J. Wiederin¹, R.M. Donahoe², H. Fox¹ and H.E. Gendelman¹

¹Department of Pharmacology and Experimental Neuroscience, College of Medicine

²Department of Pathology, School of Medicine, University of Nebraska Medical Center, USA

HIV-Associated Neurocognitive Disorders (HAND) are a spectrum of clinical disorders ranging from asymptomatic neurocognitive deficits to dementia which develops at some point during the progression of HIV-1 infection in approximately 50% of infected individuals. Currently, only clinical evaluations are available to assess cognitive impairments in HIV-1 infected individuals because measurements of viral load either in CSF or plasma have failed to provide reliable indications for HAND. Thus, laboratory tests for new biomarkers for HAND are urgently needed.

Since 2003 our laboratories used multiple proteomic profiling platforms to assess differentially expressed proteins for the goal of finding disease biomarkers. We evaluated serum/plasma and cerebrospinal fluids from humans and plasma samples from Rhesus monkeys infected with SIV smm9. Some of these studies were directed specifically to discover biomarkers while other studies aimed at more basic exploration of molecular mechanisms underlying development of HAND.

The combined results show differentially expressed proteins which are primarily made in the liver in response to inflammation, while others are made in the brain. Observed changes in expression patterns from acute to chronic stage show that various components of the organism's response to viral infection are differentially regulated, which define patterns associated with the course of viral survival in ongoing attempts of the host at immunosurveillance.

Although cohorts of samples used for discovery and validation phases in all these studies are too small to draw more general conclusions about utility of differentially expressed proteins as diagnostic biomarkers, they provide new insights into host's response to HIV infection.

Biography

Dr. Pawel Ciborowski has completed his Ph.D in 1983 from National Institute of Hygiene in Warsaw, Poland. After post-doctoral training as Alexander v. Humboldt Fellow at the University of Cologne, Germany he spent 2 years as visiting scientist at that University of Lund, Sweden he came to US to work in academia (University of Pittsburgh) and biotech industry. In 2003 he joined University of Nebraska Medical Center where currently he is Associate Professor in the Department of Pharmacology and Experimental Neuroscience and Director of Mass Spectrometry and Proteomics Core Facility. He published 64 papers and contributed 7 proteomics related chapters.