

## **DISCOVERY OF A POTENTIAL FIVE-MARKER PANEL FOR THE DIAGNOSIS OF STROKE**

Allard L.<sup>1</sup>, Lescuyer P.<sup>1</sup>, Burgess J.<sup>1</sup>, Nadia W.<sup>1</sup>, Hochstrasser D.F.<sup>1</sup>, Sanchez J-C.<sup>1</sup>

<sup>1</sup>Biomedical Proteomic Research Group, Central Clinical Chemistry Laboratory, Geneva University Hospital, CH-1211 Geneva 14, Switzerland.

laure.allard@dim.hcuge.ch

An early diagnostic marker of stroke, ideally capable of discriminating between ischemic and hemorrhagic stroke, would allow immediate therapeutic interventions and hence reduce the extent of damage and risk of death. Here, we describe two proteomic approaches to discover cerebrospinal fluid (CSF) and plasmatic potential biomarkers of stroke. The protein content of post-mortem CSF samples (n=4), a model of massive brain insult, was analyzed by two-dimensional gel electrophoresis (2-DE). Fifteen polypeptides were shown differentially expressed ( $p < 0.05$ ). Their identification revealed proteins associated with neurodegenerative diseases, ubiquitin proteasome and/or oxidative stress. Further ELISA validation in serial stroke plasma samples (n=22) confirmed the H-fatty acid binding protein (H-FABP) as being a valid serum biomarker for the early diagnosis of stroke. However, further studies on a large group of patients are warranted. The second approach relied on Surface Enhanced Laser Desorption Ionisation (SELDI) protein profiling. Spectra of plasma samples from stroke patients (n=21) were compared to healthy controls. Seven differentially expressed peaks ( $p < 0.05$ ) were identified as Apolipoprotein CI (ApoCI), Apolipoprotein CIII (ApoCIII), Serum Amyloid A (SAA) and Antithrombin-III (AT-III) fragment. Assessment of ApoCI and ApoCIII levels in stroke plasma samples using a sandwich ELISA enabled the discrimination of an ischemic event from a hemorrhagic event with a high sensitivity and specificity ( $p < 0.005$ ). Altogether, these results suggest that an extension to this study should be undertaken to assess the acute stroke diagnosis sensitivity of a five-marker panel including H-FABP, ApoCI, ApoCIII, SAA and At-III fragment.