UFD1 and GSTP as early blood markers of stroke

Turck N.[1], Allard L.[1], Walter N.[1], Burkhard P. R.[2], Hochstrasser D.F.[1, 3], Montaner J.[4] and Sanchez J-C[1].

[1]Biomedical Proteomics Research Group, Department of Structural Biology and Bioinformatics, Medical and University Center, CH-1211 Geneva 4, Switzerland; [2]Neurology Department, Geneva University Hospital, CH-1211 Geneva 14, Switzerland; [3]Pharmacy Section, Faculty of Sciences, Geneva University; [4]Laboratorio de Investigación Neurovascula, Unidad Neurovascular, Servicio de Neurología, Hospital Vall d'Hebron, Barcelona, Spain

natacha.turck@medecine.unige.ch

Stroke or vascular cerebral accident is the leading cause of death and disability in industrialized countries. Currently the diagnosis of stroke relies on historical data, neurological examinations and various neuroimaging techniques. Reliable plasmatic markers of stroke may provide additional quantitative and easily interpretable data that may help clinicians to assess the diagnosis and prognosis.

In order to identify new potential markers of stroke, we used a proteomic approach scheme to compare the protein content of human post-mortem cerebrospinal fluid (CSF) and human ante-mortem CSF. Indeed, CSF is an ideal fluid to use in search of biomarkers of brain injury. Owing to the close proximity of CSF to the brain, changes that occur in the protein composition of CSF often reflect changes that have occurred in the brain.

Using two- dimensional gel electrophoresis, we identified 11 proteins that were differentially expressed in post-mortem CSF as compared to ante-mortem CSF samples. Among them, UFD1 (Ubiquitin Fusion Degradation protein 1) and GSTP (Gluthatione S Transferase P) appeared as over-expressed in post-mortem samples.

ELISA validation was performed to measure seric concentrations of UFD1 and GSTP on a cohort of European patients encompassing 30 controls subjects and 39 stroke patients. This study showed a significant increase of UFD1 and GSTP concentrations on sera of stroke patients compared to controls with a sensitivity of 94.87 % for UFD1 and 71.8 % for GSTP and a specificity of 73.33% and 90%, accordingly. Moreover, this study confirmed previous results obtained for NDKA and PARK7 [1].

Taken together, this study further established the utility of proteomic strategies combined to ELISA validation as first steps toward the discovery of blood

markers of brain injury. Furthermore, it is for the first time that UFD1 and GSTP emerged as early blood markers of stroke.

REFERENCES

[1] Allard L, Burkhard PR, Lescuyer P, Burgess JA, Walter N, Hochstrasser DF, Sanchez J-C. PARK7 and NDKA as plasmatic markers of the early diagnosis of stroke. Clin.Chem. 2005 Sept 1, in press.