

## CELL TYPES AND MICROPARTICLE FORMATION IN THE CSF OF NEUROLOGICAL DISEASES

Schneider, E. Marion, Bolanos, Patricia, Walther, Paul, Loewe, Robert, Bechter, Karl

Section Experimental Anaesthesiology, University Hospital Ulm, 89081 Ulm, Germany, CIBCM y Escuela de Biología, Universidad de Costa Rica, San José, Costa Rica, Section Electron Microscopy, University of Ulm, 89081 Ulm, Germany, Genewake GmbH, 82061 Neuried, Germany, Clinic for Psychiatry and Psychotherapy II, University Hospital Ulm, 89312 Guenzburg, Germany

The involvement of immune pathological pathways in the manifestation of complex neuroinflammatory diseases is difficult to address in humans. Schizophrenia is associated with systemic inflammation, trauma, and a higher prevalence of antibody formation. An altered immune response in the central nervous system also plays a role in multiple sclerosis, with evidence for virus infections, and viral reactivation during relapse. Using material from patients with schizophrenia and major depression, primary analyses addressed measurements of inflammatory cytokines using validated assays (Siemens, Immulite), followed by electron microscopy of dendritic cells detected in the cerebrospinal fluid (CSF) with i) phagocytic properties (phDC) and ii) the capacity to secrete microparticles. The third component addresses the contents of miRNA species in fluid as

well as membrane particle fractions of the CSF as compared to plasma isolated by ultracentrifugation. We repeatedly found increased concentrations of IL-1beta in patients' CSF at higher concentrations than in plasma. Morphological studies revealed phDCs with extensive membrane protrusions giving rise to microparticles. Microparticles, ectosomes and exosomes enriched by ultracentrifugation were successfully used to prepare miRNA isolates. Variations in the miRNA species identified, could explain altered gene expression patterns of meningeal cells in the brain. The protocol developed, is feasible to study larger patient populations and compare the miRNA patterns in microparticles, ectosomes and exosomes of CSF as compared to plasma. Results based on this concept may contribute to our understanding the complex etiology underlying these diseases.