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HIV-1 and Mononuclear phagocytes: Omics approaches to understand their coexistence

Mononuclear phagocytes (MPs) serve as vehicles for dissemination of persistent human immunodeficiency virus type one (HIV-1) infection and as reservoirs for long-term infection. The ability of MPs to cross blood-brain barrier leads to dissemination of the virus in the brain. MPs are also resistant to virus-induced cytopathic effects. Interestingly, replication of HIV-1 in monocytes is restricted, but increases after the cell migrates to distant organs and differentiates to tissue macrophages. Despite more than two decades of extensive research it is not fully understood how virus alters the functions of mononuclear phagocyte to complete viral life cycle and directly and indirectly influence the course of disease. Besides comparison of quantitative changes of thousands of proteins proteomic profiling proteomics now offers a number of additional and unique benefits such as detection and quantitation of proteins which are posttranslational modified and their sub-cellular localization which is altered during the course of disease. Moreover, substantially increased sensitivity of protein detection and quantitation allows using limited number of cells isolated from patients. Taking this together, such studies, although still emerging, provide new and unique insights into how HIV-1 and MP co-existence is regulated, thus having high potential of discovery new therapeutic targets.

Biography

Prof. Pawel Ciborowski is currently in the Department of Pharmacology and Experimental Neuroscience at the University of Nebraska Medical Center, College of Medicine. He is also a Director of Mass Spectrometry and Proteomics Core Facility. His own research as Principal Investigator is focused on application of proteomics to understand molecular mechanisms underlying HIV-1 and mononuclear phagocyte interactions facilitating virus replication and long term survival. As core director he participates in multiple collaborative projects mostly focused on HIV-1 infection. He has often been invited to speak at international conferences and serves on the editorial board of several journals.