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Monocyte biomarkers define sargramostim treatment outcomes for Parkinson's disease

Mai M Abdelmoaty
University of Nebraska Medical Center, USA

Clinical and pathobiological diversity of Parkinson's disease (PD) presents a major challenge in the development of relevant biomarkers to monitor disease progression and disease-modifying therapies. The dysregulation of innate immunity is involved in both the development and progression of PD through impairments in monocyte activation, function, and secretion. Based on such and after assisted leukapheresis and centrifugal elutriation, changes in pure populations of monocyte-macrophage were evaluated for gene and protein expression in five PD patients. These studies were performed before and two and six months during the course of immune modulatory neuroprotective granulocyte-macrophage colony-stimulating factor (GM-CSF, sargramostim, Leukine®) therapy. Transcriptome and proteome biomarkers were scored against clinical motor function. Pathway enrichments from single cell-RNA sequencing and proteomic data sets presented disease-relevant biomarkers of antioxidant, anti-inflammatory, and autophagy genes and proteins. These included, but were not limited to, LRRK2, HMOX1, TLR2, TLR8, NF-κB, Atg7, and GABARAPL2. Sargramostim therapy now provides a monocyte signature capable of scoring clinical motor functions during disease-linked immune transformation therapy.

Biography

Mai Abdelmoaty is a PhD candidate in University of Nebraska Medical Center (UNMC, USA). She started her career in 2007 as a Pharmaceutical Researcher at National Research Centre (Egypt). She got MSc in Biochemistry (Ain Shams University, Egypt) in 2012. She was a Fulbright scholar at UNMC in 2016 before starting her PhD studies in 2017. She worked as a Teaching Assistant in Department of Pharmaceutical Sciences (COP, UNMC) in 2018. Her research interests are biological evaluation of nanoformulations in vitro and in vivo, stem cell research, RNAi research, and investigating the interactions of myeloid immune cells with different stimuli such as SARS-CoV-2 and GM-CSF.

mai.mostafa@unmc.edu