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Comparative proteome analysis by SELDI-MS of the dopaminergic cellular model A1 after NURR1 over-expression

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The transcription factor NURR1 plays a pivotal role in the development and maintenance of neurotransmitter phenotype in dopamine neurons. These neurons are present in the substantia nigra of the midbrain, and produce the neurotransmitter dopamine by which control many functions of the brain, including mood, stress, and muscle control. The decrease in dopamine levels is associated with a number of dopamine-related disorders, including Parkinson's disease. Aim was to characterize the change in the protein expression during the differentiation of the dopaminergic cell line A1 in order to identify targets for diagnostics and therapy. It was approached to the proteomic profiling of neuronal cells after differentiation by NURR1 over-expression, using surface enhanced laser desorption/ionization time-of-flight mass spectrometry (SELDI-TOF MS). This is a novel approach to proteome profiling that combine two powerful technologies: chromatography and mass spectrometry. By using different surfaces and different binding/washing conditions a detailed profile of the proteins present in a sample can be obtained. In this way, mass spectra from controls and cells at different developmental stage, obtaining several clusters of protein mass values in different operative conditions were obtained. In order to analyze this large amount of data, a web application was developed to compare results and give differences as well as up- and down-regulation in protein expressions. At the same time, using human or mouse sequence databases, the application will predict the most probable protein related to the identified mass value. This tool will be integrated by other utility as gene localization on chromosome.

Biography

Ferdinando Febbraio has completed his PhD in Biochemistry and Molecular Biology in 2001 at University of Naples. He is Researcher at Institute of Protein Biochemistry of National Research Council. He has published more than 40 papers in international journals.

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