

TITLE

BIOMARKERS IN NEUROTOXICITY

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Neurotoxicity is any adverse effect on the structure and function of the central and/or peripheral nervous system by biological, chemical or physical agent. Biomarkers are measurements of pharmacological and physiological parameters or that of specific biochemical in the body, for measuring the progress of disease or efficiency of treatment.

Identifying novel biomarkers for neurotoxicity is imperative for effective treatment of most complex neurological disorders. This is hindered by unique cellular and phenotypic complexities of brain. Mere identification of novel biomarkers would yield scientific and clinical correlates for diagnosis, provide insight into disease mechanism and address current shortcomings in therapeutics of neurological disorders affecting millions worldwide.

Genomic, proteomic and metabolomic technologies help in overcoming obstacles for biomarker identification resulting in earlier and more specific diagnoses, identification and validation of therapeutic targets and monitoring treatment effects. With the 'omic' strategy, biomarkers are identified at all levels of biology namely, DNA, RNA, proteins and small molecules.

Many constituents of cerebrospinal fluid have been suggested as markers for brain dysfunction, e.g. Microglial antibodies and paired helical filaments in Alzheimer's disease. Auto antibodies to glial fibrillary acidic protein and synaptic protein can be detected at 2ng/L in serum, even before appearance of conventional indices of neurotoxicity such as behavioral and histopathological changes. Thus early subclinical brain damage can be assessed with novel biomarkers. Bioinformatics and biostatistic tools will play an important role in compiling this huge data. Thus making meaningful advances in biomarker discovery and neurological disorders will not be a devastating disease any more.