

## Editorial

### Biochemical Targets and Biomarkers for Central Nervous System Protection and Monitoring

To date, despite the improvements of the new perinatal and intra-operative monitoring techniques, the post-insult time is of extreme importance, since the clinical symptoms and instrumental monitoring parameters might not be yet apparent and the therapeutic window for a possible pharmacological intervention (6-12 hours) may be limited, at a time when the damage to the brain has already been occurred. Therefore, measurement of biochemical markers for non-invasive assessment of brain damage of newborns at risk turns out to be extremely useful in clinical practice for the diagnosis and follow-up of infants at high risk [1]. In this regard, the use and development of new biomarkers may serve as important tools not only for central nervous system injury diagnosis and prognosis but also for the monitoring of pharmacological treatments.

The working group of the National Institute of Health for the definition of biomarkers in 1998 defined the biomarker as a characteristic that can be measured and evaluated as an indicator of physiological biological processes, pathological response, or pharmacological response following a therapeutic intervention.

In the present special issue, we will present the significance and possible clinical applications of different biomarkers. To date, several biomarkers such as neuro-proteins, calcium binding proteins, oxidative stress markers, vasoactive agents, inflammatory mediators have been investigated [2, 3]. Some of the manuscripts of this special issue showed that biomarkers could be of great potential clinical relevance in different conditions, such as congenital heart diseases, cardiac surgery and cardiopulmonary bypass [4, 5], antenatal maternal pharmacological treatments (i.e. antidepressant) [6], neuroinflammation [7], adaptation of the circulatory system to birth [8]. Furthermore, we included also manuscripts describing important pathophysiological cascade underlying central nervous system injury and their possible applications in new biomarkers development [9-15].



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