

¹H-NMR metabonomic view on schizophrenia

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Schizophrenia (SCZ) is a brain disease leading to significant functional impairments and premature death, and it affects 20 million people worldwide. Due to the complexity of this disease including different genetic and environmental factors, there is a lack in understanding pathophysiology and diagnosis of schizophrenia. In order to overcome existing gaps, the establishment of a universal set of SCZ biomarkers has a crucial role. Metabonomic study of serum samples of Serbian patients with schizophrenia (51) and healthy controls (39) by ¹H-NMR analyses associated with chemometrics, provided the identification of 26 metabolites/biomarkers for this disorder. The biomarker set including aspartate/aspartic acid, lysine, 2-hydroxybutyric acid, and acylglycerols was established for the first-time in SCZ serum samples of Serbian patients by ¹H-NMR experiments. The other 22 identified metabolites are in agreement with the previously confirmed NMR-based serum biomarker sets of Brazilian and/or Chinese patient samples. The same 13 metabolites (lactate/lactic acid, threonine, leucine, isoleucine, valine, glutamine, asparagine, alanine, gamma-aminobutyric acid, choline, glucose, glycine and tyrosine) were established in all SCZ samples from three countries of different ethnicity and geographical origins (Serbia, Brazil and China). These results emphasize the crucial role in the possibility of their application as biomarkers for diagnosis of SCZ, reliable monitoring of treatment response and clinical outcomes.