Book Review

Proteomics and Metabolomics in Psychiatry
By D. Martins-de-Souza, editor,
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The molecular bases of many diseases are established and have proven indispensable for diagnosis and treatment. This is not the case in psychiatry. *Proteomics and Metabolomics in Psychiatry*, edited by Daniel Martins-de-Souza and published by Karger is the 29th volume in the series *Advances in Biological Psychiatry*, provides clinicians with a much needed review of what is available in the field today. This volume tries to fill this gap with a review of what is known in terms of the molecular foundation of these psychiatric disorders. It is divided into schizophrenia and psychotic disorders and mood disorders. These articles bring into focus that the many nuances observed in neurological disorders have overlapping pathways on a molecular level. This ultimately is what makes diagnosis so difficult and challenging. A proteomic and metabolomic approach to these diseases is therefore vitally important. This is a timely, necessary, and readable review. The contributors cover and discuss the necessary tools of the trade in proteomics and metabolomics. Coverage of mass spectrometric based techniques by many of the authors is especially appropriate because of the critical role this versatile technique plays in proteomics and metabolomics. The structures of molecules identified from proteomic and metabolomic investigations can then be confirmed using nuclear magnetic resonance spectroscopy.

The proteomics and metabolomics of schizophrenia and psychotic disorders is covered in six reviews. Martins-de-Souza and colleagues present an overview of the characterization of the brain and cerebrospinal fluid of schizophrenia patients from a proteomic point of view. Krzysztof and coworkers present a thorough review of peripheral biomarker candidates in schizophrenia from both animal and human models using a variety of analytical techniques from ELISA to mass spectrometry. This area of research is of great importance in developing clinically relevant assays to help diagnose and treat patients. But a lot of work is still required before this field is mature enough to be added to the clinical arsenal. Rujescu reviews the blood, serum, and plasma metabolomics of schizophrenia and the advances in nuclear magnetic resonance and mass spectrometry which makes possible assessing hundreds of small molecules and their impact in the disease process. The proteomic and metabolomics evidence for glial alterations in schizophrenia is presented by Barakauskas and Beasley. Drug discovery in schizophrenia and the impact that proteomics has on this field is reviewed by Cotter and coworkers. They describe the impact that proteomics and related techniques have had on the preclinical models of schizophrenia. Orešič reviews the psychotic disorders based on their metabolic comorbidities and how metabolomics can answers some of the difficult molecular questions and their applicability to early disease detection and identification.

Mood and bipolar disorders are covered in five reviews. A review of peripheral biomarkers for depression using serum and plasma proteomics is reviewed by Domenici. Carboni reviews the preclinical models of depression and how proteomics can improve diagnosis and treatment. Antidepressant response using metabolomics is reviewed by Li and coworkers. They focus on the discovery and classification of biomarkers from a variety of biological matrices, urine, plasma, and tissues. Sussulini reviews the proteomics and metabolomics of bipolar disorder. The review looks at the literature with regards to potential protein biomarkers for bipolar disorder and those that might relate to lithium therapy focusing on the primary differential proteins. Anxiety disorders and their pathophysiological pathways and how proteomics and metabolomics has impacted the understanding in this field is discussed by Altmaier and Emeny. They present a review with results from both human and animal studies, and an overview of animal studies using a systems biology approach.

There will be many clinical applications in the future which will utilize the results from proteomic

and metabolomic investigations of these diseases. The aim of using advanced analytical tools with the focus on proteomics and metabolomics to investigate psychiatric disorders is not only to understand these disorders on a molecular basis, but to develop out of these investigations molecules which can be used as evaluative and diagnostic tools. These molecules will be from a variety of classes of compounds such as fatty acids, amino acids, proteins, glycoproteins, etc. These new tools in development will not only be used in diagnosis, but also in the treatment phase to establish the efficacy of various drug interventions, such is currently the case with diabetes and the ready availability of glucose meters to monitor the patient.

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