Chapter

Introductory Chapter: Behavioral Pharmacology - From Basic to Clinical Research

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1. Behavioral pharmacology

Behavioral pharmacology is a multidisciplinary field of science focused on exploring and understanding the effects of chemical substances, hormones, and drugs on the behavior of humans and experimental animals, all with the final objective of understanding the neurobiological substrate of behavior and contributing in the development of therapeutic agents or pharmacologic tools for research in neurosciences [1]. The relative new popularity and accelerated growth of neurosciences have simultaneously led to an exponential growth on the scientific literature on this area that has been produced every day [2–6]. That makes necessary new strategies to be ready in a field that has been constantly actualized; for example, years ago, students with different backgrounds, who are graduates of psychology, medicine, or chemistry, had to study postgraduate trainings to specialize in the field of neurosciences. Nowadays, students from diverse universities can apply a career in "neurosciences" that has been recently designed by the National Autonomous University of Mexico few years ago [7]. This is an example on how universities have adapted to offer a better preparation on neurosciences fields. In this sense, the present book also attempts to offer the reader a source of current knowledge in behavioral pharmacology from different backgrounds.

Despite the relatively brief history of the behavioral pharmacology, it has significantly contributed in the understanding of the importance of the environmental and behavioral factors that determine the effect of drugs and chemical compounds with potential therapeutic and toxicological actions that impact on the health of the human being or another organisms [8]. In this way, the experimental and clinical procedures into the behavioral pharmacology have permitted the identification of natural or synthetic substances with potential utility in the treatment of central nervous system disorders, including anxiety, depression, and Alzheimer's and Parkinson's diseases [9–15], among others.

In support, the present book is a multidisciplinary compilation that illustrates the advancement and development of behavioral pharmacology supported in areas as pharmacology and psychology, experimental analysis of behavior, psychophysiology, and the recently called neurosciences such as neuroethology, neurophysiology, and neurochemistry, among others. In this book, the authors included and discussed results in the field of behavioral pharmacology and neurosciences. The chapters include scientific information derived from basic research in laboratory animals and the impact that this information has in the

development of potential pharmacological treatments to be applied in the clinical research to contribute in the wellness of the human being. The relevance of these contributions is the discussion of the experimental analysis of behavior under diverse pharmacological treatments, including complementary results from neurochemistry, neuropharmacology, neurophysiology, psychopharmacology, neuroanatomy, and molecular biology that permit the identification of the mechanism of action involved in the potential beneficial and toxic effects of the evaluated drugs.

2. Author's contribution to the present book

Cueto-Escobedo and collaborators (Chapter 2) show a brief history of the development of behavioral pharmacology over the years, as well as the contribution of this science in the development of animal models that have contributed in the knowledge of the biological bases of behavior and importantly in the identification of potential therapeutic and toxic agents that may impact on the central nervous system disorder. Fernández-Demeneghi and collaborators (Chapter 3) report how identifying the potential beneficial effects of functional food on health has been possible through the use of the techniques of behavioral pharmacology. In this case they report the effects of berry juice or its secondary metabolites (i.e., polyphenols, anthocyanins, and other constituents) on some central nervous system disorders like anxiety, depression, Alzheimer's and Parkinson's diseases, and cognitive alterations. Hernandez-Lozano and collaborators (Chapter 4) discuss the potential use of botanical and natural pharmaceutical resources in the management of neuropathy pain based on preclinical studies. Additionally, include relevant information about of the phytochemical, toxicity, adverse effects, and biosecurity reported to botanical and natural pharmaceutical resources used in pain control.

The evaluation of natural products or new synthetic molecules with potential application in the treatment of symptoms that impact on the wellness of animals or human beings firstly may be based on exploring their effects in a traditional context (i.e., using extracts, infusions, or juice), but derived from these studies, a more specific screening is focused on isolated, characterized, and purified secondary metabolites, where a more controlled dosage may be realized. Garcia-Rios and collaborators (Chapter 5) describe and discuss preclinical results of specific plant secondary metabolites and their potential use in clinical therapy of anxiety and depression, which is compared with clinically effective anxiolytic and antidepressant drugs. Particularly, the anxiolytic and antidepressant effects of terpenes, flavonoids, alkaloids, and sterols and their mechanism of action on the central nervous system are discussed.

Behavioral pharmacology studies also had contributed in understanding neurobehavioral bases that underlie some psychiatric disorders and the pharmacological action of drugs in a specific context. Guillen-Ruiz and collaborators (Chapter 6) provide a general overview of the usefulness of animal behavioral models to explore the anxiety disorders in childhood and its neurobiological bases and to then explore potential anxiolytic therapies to minimizing side effects in this particular population. Finally, Ocampo-Ocampo and collaborators (Chapter 7) address the problem of addiction and their treatment from behavioral analysis and an integrative holistic approach, with the aim of preventing or reducing the physical and mental damage that addictive substances may cause to the health, improving the quality of life of psychoactive substance consumers.

3. Concluding remarks

This short chapter must be considered to be a brief and necessarily incomplete review that has the only purpose of introducing the works of the authors in the next chapters to the reader. As you can see, behavioral pharmacology has brought great progress in the understanding of the neurobiology of different central nervous system disorders and in the understanding of the mechanism of action of drugs used to treat such disorders, as those mentioned in this chapter and the whole book. We hope the present work will enrich your knowledge on the study of behavioral pharmacology.

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