

# Preface

Animal models and tests have become increasingly important for biomedical research, enabling a better understanding of pathogenic pathways involved in various human disorders. Over the last decades, zebrafish (*Danio rerio*) has become a very popular model organism in biomedical research. But, as we are often asked, why zebrafish? This small aquatic vertebrate fish species has traveled all the way from its natural habitat in India to emerge as a promising model organism in developmental biology, genetics, physiology, and toxicology. Recently, this fish has entered the waters of neuroscience and biological psychiatry, quickly becoming an indispensable model species in this field. With a high genetic homology to humans (~75 % based on coding regions), it is not surprising that humans and fish are very similar physiologically (and behaviorally)—perhaps, more than we would like to admit.

Therefore, it should not come as a surprise that zebrafish can be an excellent model of human neuropsychiatric disorders. While some classical psychiatrists may not too easily be persuaded by this generalization, the current book *The Rights and Wrongs of Zebrafish: Principles of Behavioral Phenotyping and CNS Disease Modeling* explains, in a domain-by-domain manner, how exactly zebrafish models can be used to target a wide range of human brain disorders and aberrant phenotypes. Chapter “Mutagenesis and Transgenesis in Zebrafish” discusses zebrafish genetic (mutant and transgenic) models. The book’s next two chapters describe zebrafish models relevant to the two most common brain disorders—anxiety and depression. Chapter “Assessing Cognitive Phenotypes in Zebrafish” explains how to best assess zebrafish cognitive phenotypes, and chapter “Social Phenotypes in Zebrafish” comprehensively evaluates the spectrum of zebrafish social behaviors. Zebrafish models of obsessive-compulsive disorder and attention deficit/hyperactivity disorder are discussed in chapters “Modeling OCD Endophenotypes in Zebrafish” and “Zebrafish Models of Attention-Deficit/Hyperactivity Disorder (ADHD)”, followed by chapters “Zebrafish Neurobehavioral Assays for Drug Addiction Research” to “Zebrafish Behavioral Models of Ageing” on zebrafish neurotoxicity, sleep, addiction, and aging. Chapter “Integrating Morphological and Behavioral Phenotypes in Developing Zebrafish” discusses neurophenotyping of

developing zebrafish, and chapter “Neuroimaging Phenotypes in Zebrafish” highlights the importance of neuroimaging biomarkers in zebrafish models of CNS disorders. Finally, chapter “Illustrated Zebrafish Neurobehavioral Glossary” contains a very useful zebrafish neurobehavioral catalogue—a comprehensive updated and illustrated glossary of all major larval and adult zebrafish behaviors currently known.

The contributors to this book are leading international scholars whose work spearheads innovative zebrafish neuroscience research around the world. Written by top experts in the field, this book makes for a useful, balanced, and up-to-date reading that outlines the use of zebrafish to study the pathological mechanisms underlying neuropsychiatric disorders.

Finally, the authors want to make sure that this book is actively used in research laboratories. So go on and cover its pages with notes, question marks, and little pencil drawings in the margins—perhaps, with designs of new experiments or future, better, and more sensitive zebrafish behavioral models. The authors would not have wanted this book any other way.

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