

Current Topics in Behavioral Neurosciences

Volume 23

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Editors

The Neurobiology and Genetics of Nicotine and Tobacco

 Springer

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Preface

When one of us (DJKB) first started studying the psychopharmacology of nicotine some 40 years ago the numbers of researchers interested in the topic was small and could probably be accommodated around a large dinner table. Our understanding of the potential hazards of smoking was at a fairly early stage as was our understanding of the neural mechanisms that mediated the behavioral responses to nicotine. At that time smoking was considered to be a habit, not an addiction, and was still widely accepted. Readers who are not old enough to remember those times may be familiar with the television series, *Mad Men*. That series gives you an impression of how acceptable smoking was. Even into the 1980s, the fact that neurones within the brain expressed nicotinic receptors was still debated among some researchers. We have come a long way since that time, and now it is not unusual to have 1,000 delegates or more at conferences on nicotine and tobacco, and sessions dedicated to nicotine are not uncommon at many neuroscience conferences. Moreover, public health policy is now driven by a sound evidence base relating both to the toxicity of primary and second-hand (also known as environmental) tobacco smoke and the plethora of neuroscience studies that have established nicotine as one of the most widely studied recreational drugs. The primary purpose of the chapters in this book and its companion volume is to explore the extent to which the wide range of approaches adopted to investigate the behavioral responses to nicotine and the molecular and neural mechanisms that mediate these effects have opened our eyes to the properties of this unique and fascinating drug.

The chapters in the book are divided into two sections. The first considers the molecular and genetic factors which influence the responses to nicotine and tobacco. This section of the volume addresses the nature of the receptors in the brain that mediate the responses to nicotine and how an understanding of the genetic variation within these receptors, the neurotransmitter systems that respond to them and the metabolic clearance of the drug impacts on nicotine and tobacco dependence and its successful treatment. The second section focuses on the evidence that nicotine may exert potentially beneficial effects within the brain, particularly with regard to memory and attention. These cognitive effects of the drug may explain, in part at least, why some people with underlying

psychopathologies of cognition, such as schizophrenia or attention deficit hyperactivity disorder (ADHD), are particularly vulnerable to tobacco dependence and resistant to treatment. The chapters in this section of the book also seek to relate our understanding of the structure of neuronal nicotinic receptors to their effects on attention and learning and memory. The last chapter of this section considers the way in which learning theory can be recruited to explain some of the important elements of nicotine dependence.

We hope that the volumes *The Neurobiology and Genetics of Nicotine and Tobacco* and *The Neuropharmacology of Nicotine Dependence* will provide readers with a contemporary overview of current research on nicotine psychopharmacology and its role in tobacco dependence from leaders in this field of research and that they will prove valuable to those who are developing their own research programs in this important topic.

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