

Preface

The last 20 years have witnessed an explosive increase in research exploring the function of the orbitofrontal cortex. In 1987, when Dr. Goldman-Rakic described the circuitry of the primate prefrontal cortex and its role in regulating behavior, her seminal work encompassed 44 pages and included several hundred references; yet this article contained less than one page of material about the orbitofrontal subdivision of the prefrontal cortex. Only nine papers published that year included the term *orbitofrontal*.^a

Since then, interest in the orbitofrontal cortex has increased substantially, with much of that growth occurring only in the last few years. For example, in 2000 the Society for Neuroscience published only 13 abstracts from its annual meeting that mentioned the term *orbitofrontal*, but this number had grown to 34 by 2004.^b Further, in 2004, 187 papers that included this term were published. Since then, interest in the orbitofrontal cortex has continued to increase, reaching a publication rate of 37.4 papers per month thus far in 2007 (FIG. 1). This accelerated growth is partly attributable to the similarities in orbitofrontal function that appear to exist across species. These similarities are remarkable, despite the numerous subregions discernible within the orbitofrontal cortex and the evolutionary specializations of certain groups, such as primates, which have an expanded frontal cortex relative to other mammals. The relatively widespread recognition of these similarities has promoted research and fostered useful collaborations not only between research laboratories working in different animal models, but also between laboratories studying animal models and those investigating humans. Through this work, it is increasingly apparent that the orbitofrontal cortex figures prominently in a variety of behaviors that are disrupted in neurological and neuropsychiatric diseases. As a result, understanding the functions of this formerly obscure prefrontal cortical area has taken on new urgency.

For this reason, we thought the time was ripe for a scientific meeting on the topic of orbitofrontal cortex function, in part simply to provide a forum in which diverse labs studying the orbitofrontal cortex from different perspectives could interact. For example, the orbitofrontal cortex has been variously described as an olfactory association cortex by those interested in olfactory

^aNumbers of published papers including the term *orbitofrontal* were obtained from searches on PubMed in September 2007; note that PubMed adds articles over time. Thus the numbers for past years may change marginally as additional articles are indexed.

^bNumbers of abstracts mentioning the term *orbitofrontal* were obtained from searches of abstracts on the Society for Neuroscience Web site.

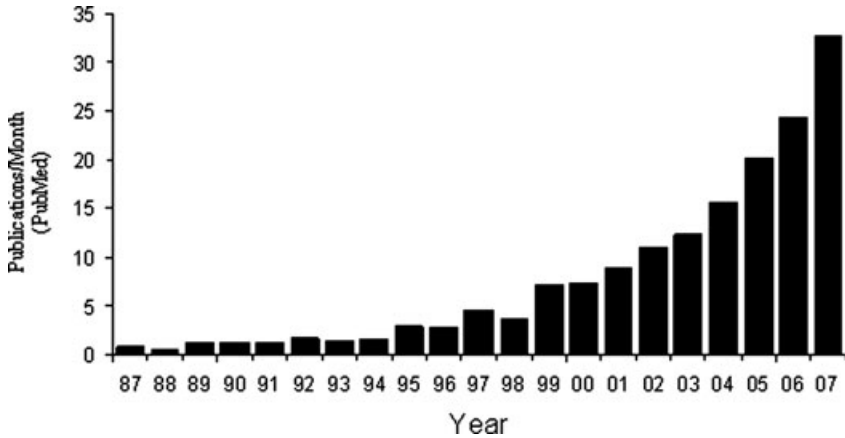


FIGURE 1. “Orbitofrontal” publication rate.

processing, a prefrontal working memory system by those interested in memory function, and a system for controlling emotions by those interested in limbic function. Rarely has the orbitofrontal cortex been considered a critical nexus linking these circuits, with an important general function (or functions) that may inform neural processing within each of these systems.

The chapters in this volume of the *Annals* are a result of this meeting, Linking Affect to Action: Critical Contributions of the Orbitofrontal Cortex, which was held in New York City between March 11–14, 2007 at the conference headquarters of the New York Academy of Sciences in an impressive new building at the World Trade Center. Here, a diverse collection of established investigators and junior researchers with a common interest in understanding the orbitofrontal cortex met to discuss recent work and outstanding issues, and also to consider whether general characteristics of orbitofrontal cortex function could be identified from disparate approaches spanning different species and different methodologies.

Following the organizational scheme of the conference, the present *Annals* volume has been organized into several themes. We start with sections that consider the defining features of the orbitofrontal cortex, including its anatomy in different species, its evolutionary ties to more primitive chemosensory processing systems, and its more recent role in general associative learning. Next, the volume considers how the orbitofrontal cortex interacts with the various circuits that are critical to learning, memory, affect, and decision making, including the hippocampus, amygdala, striatum, and other prefrontal areas. The volume concludes with a focus on orbitofrontal cortex dysfunction as it pertains to aging, addiction, and neuropsychiatric disease, with the hope that ideas generated in earlier chapters might shed light on the importance of pathological changes in the orbitofrontal cortex in these disease states.

It is our sincere hope that the ideas presented in this volume—like those at the meeting—will not only provide a foundation of common ground derived from the last 20 years of work on orbitofrontal cortex function, but also will highlight the critical issues in need of investigation over the next 20 years.

In closing, we would like to thank the speakers who contributed to the success of the meeting and to the content of this volume. We would also like to express our gratitude to all those who made this meeting possible through their generous financial support. Numerous agencies at the National Institutes of Health, including NIDA, NIMH, NINDS, and NIA, provided major support through a scientific grant, without which the meeting and present monograph would not have been possible. We are further grateful to Plexon, Coulbourn, Sanofi-Aventis, AstraZeneca, Bristol-Myers Squibb, and Bowdoin College for their key financial contributions. Finally we would like to thank the New York Academy of Sciences, including Shari Dermer, Kara-Leigh Dockery, and Stacie Bloom, for their excellent job in organizing and hosting such a fruitful meeting; and Kirk Jensen, Linda Mehta, Steven Bohall, and Ralph Brown, for their skillful editorial and production work on this volume.

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