Journal of Neural Transmission

Supplementum 36

A. H. Tuma, E. M. Stricker, and S. Gershon (eds.)

Advances in Neuroscience and Schizophrenia

Springer-Verlag Wien New York

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Typeset by Best-set Typesetter Ltd, Hong Kong

Printed on acid-free paper

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With 42 Figures

ISSN 0303-6995

ISBN-13:978-3-211-82347-7

e-ISBN-13:978-3-7091-9211-5

DOI: 10.1007/978-3-7091-9211-5

Preface

On May 6, 1991, the Center for Neuroscience and Schizophrenia of the University of Pittsburgh began a two-day workshop to discuss recent advances in basic neuroscience research related to schizophrenia. Schizophrenia is an extraordinarily complex disorder of brain function, which presents as a collection of phenomena that can vary both across individuals and within the same individual as a function of time, environment, and drug treatment. For these and other reasons, it has largely defied thorough analysis and understanding to date. However, we thought that a workshop on the biology of this disorder would be useful both to summarize recent progress in this area of research, and to stimulate discussion among scientific investigators and clinicians.

There are four general approaches to contemporary studies of the biological bases of schizophrenia, and each was highlighted in the presentations made during the workshop. First, specific brain sites (e.g., prefrontal cortex) have been targeted whose dysfunction are suspected to be involved in the pathogenesis of schizophrenia, and investigators have sought to learn as much as possible about the anatomy and function of these sites and their inter-relations. Second, chemically specific transmitter systems in brain (e.g., dopamine) have been targeted whose dysfunctions are suspected to be involved in the pathogenesis of schizophrenia, and investigators have sought to learn as much as possible about the anatomy and function of these systems and their inter-relations. Third, specific psychological functions (e.g., “working memory”) have been targeted whose disruption is suspected of being critical to the pathogenesis of schizophrenia, and investigators have sought to learn as much as possible about their biological bases. Finally, specific techniques to measure brain function in vivo in schizophrenic patients and control subjects (e.g., brain imaging) have been targeted, and investigators have sought to understand the attributes and limitations of these techniques, and how they may best be refined and used in studies of schizophrenia.

Aside from the numerous details concerning the prefrontal cortex and basal ganglia, dopamine, memory, and brain imaging that emerged from the discussion, there was an exhilarating sense of progress in the ability of investigators to make progress. For example, it was just 20 years ago that we moved from measuring dopamine in whole brain to measuring it in whole striatum, and now we have the techniques to reveal the exquisite story of patch/matrix distribution of dopamine and its neuroanatomical connections. In addition to such advances in basic techniques, there also was an exhilarating variety of ideas

being considered and pursued experimentally. This field of research evidently is alive and thriving, and there is considerable enthusiasm in the quest for insight and understanding.

A good experiment is characterized not only by the quality of question that it addresses and answers, but also by the new questions it opens for investigation. The same is true of a good workshop. The panelists have asked many specific questions in their presentations, but they also raised several general questions for later consideration. There are three that deserve emphasis. First, what is the functional significance of the basic biological observations? How is brain function influenced by the existence of the patch-matrix configuration in the striatum, for example, or the presence of intrinsic catecholaminergic neurons in prefrontal cortex? Second, what is the relevance to human cognitive function of these observations in animals? How do studies of dopamine's function as a neuromodulator, or the effects of stress on brain function, translate from animals to humans? And third, what is the relevance of these issues to schizophrenia? Specifically, what does the basal ganglia have to do with schizophrenia, and how do dysregulations in dopamine manifest themselves in symptoms of schizophrenia?

The stated goal of the workshop was to provide a forum for presentation and discussion on some of this recent progress. The hidden agenda was to provide a workshop that was especially attractive to graduate students, post-doctoral fellows, research associates, medical residents, and junior faculty, so that they might get involved in these issues relatively early in their professional development and make studies of schizophrenia their lifelong interest. In that regard, we were especially pleased that there were so many young people who registered and were in attendance at the workshop. Similarly, we are very pleased that Springer-Verlag Wien is publishing the proceedings of the workshop and thereby giving it a wider, international audience. The ultimate success of the workshop will depend on the impact it had not only on those presently involved in the field but on future generations of workers who were intrigued by the mysteries and inspired by the advances of the present work.

To those young people, we say that you should appreciate how much progress has been made in a rapidly advancing field, but you should not be overwhelmed by that progress or fear that you are getting into the field too late, after the most important issues have all been addressed and answered. In fact, you should understand that we still have not answered any of the basic questions, and that we are still closer to the beginning than to the end of this quest.

The Center for Neuroscience and Schizophrenia is an interdisciplinary center at the University of Pittsburgh comprising faculty in the Department of Behavioral Neuroscience in the Faculty of Arts and Sciences and faculty in the Department of Psychiatry in the School of Medicine. Its activities are supported by a grant from the National Institute of Mental Health (MH-45156). This workshop was co-sponsored by the Department of Psychiatry, the Department of Behavioral Neuroscience, and the Center for Neuroscience, for which we are

grateful. We are also pleased to acknowledge additional financial contributions from Lilly, Sandoz, Upjohn, and Wyeth-Ayerst pharmaceutical companies. Finally, we are grateful for the contributions of all the participants and support staff to the workshop, particularly those of Jay W. Pettegrew, M.D., Theodore W. Berger, Ph.D., and Robert Y. Moore, M.D., Ph.D., who shared the chairmanship of the three sessions.

Pittsburgh, May 1992

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