

Stress, the Brain and Depression

Can stress cause depression? Studies generally point to a connection between adverse life events and depression. However, establishing a causal rather than associative connection, the key concern of this book, is more problematic. What neurobiological changes may be induced by stress, what neurobiological changes may be observed in depression, and to what extent do these changes correspond? The authors structure their examination around three major themes: the pathophysiological role of stress in depression; whether or not a subtype of depression exists that is particularly stress-inducible; and, finally, how best to study, diagnose and treat depression in relation to its biological underpinnings.

Herman M. van Praag established the first Department of Biological Psychiatry in Europe (Groningen) and became the first European Professor of Biological Psychiatry in 1968. Subsequently he became Head and Professor of Psychiatry at the University of Leiden, the Albert Einstein College of Medicine, NY, USA, and the University of Maastricht.

Ron de Kloet is Head and Professor of Medical Pharmacology at the University of Leiden.

Jim van Os is Professor of Psychiatric Epidemiology and Chairman of the Department of Psychiatry and Neuropsychology at Maastricht University.

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H. M. van Praag

Emeritus Professor of Psychiatry, University of Groningen, Utrecht, Maastricht,
and the Albert Einstein College of Medicine, New York

E. R. de Kloet

Professor of Medical Pharmacology, Leiden University

J. van Os

Professor of Psychiatric Epidemiology, Maastricht University,
and Visiting Professor, Institute of Psychiatry, London



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Preface

Can stress cause depression? This is a question of considerable importance, clinically as well as scientifically. Clinically, because an affirmative answer would elevate stress management to a prime intervention in the treatment and prevention of depression. Scientifically, because if stress constitutes a depressogenic condition, the quest for biological determinants of depression should focus primarily on the neurobiology of stress and only in the second instance on depression per se.

Traumatic life events and taxing living conditions often precede depression. In most studies it is unclear what the intensity of the emotional stress response has been. Yet, those studies generally point to a connection between adversity and depression. An associative connection; they allow no judgement on a possible causal connection. Convincing evidence of the latter would require evidence that stress may generate dysfunctions in particular brain circuitry similar to those supposedly underlying (certain components of) depression.

This, then, is the key question addressed in this book. What neurobiological changes have been ascertained in (certain types of) depression; what neurobiological changes may be induced by stress; to what extent do those changes correspond? The emphasis is laid on monoamines (MA) and stress hormones, the two systems most thoroughly studied in depression. In Chapter 7, MA ergic disturbances in depression and their possible pathophysiological significance are discussed. Chapter 8 is devoted to the CRH/HPA system, the way this system may be disturbed in depression, and the causative role these disturbances might play in the pathophysiology of depression.

In Chapter 8 the point is raised how stress affects the MA ergic and the CRH/HPA system. Human data are discussed as well as animal findings, in so far as the latter may throw light on stress effects in humans. This chapter then converges towards the question whether and to what extent the changes in the MA ergic and the stress hormone systems generated by stress and those found in (certain types of) depression overlap.

If there are reasons to assume that stress can indeed be a depressogenic factor, the question can be posited whether this applies to depression in general or to particular subtypes of depression. This is the subject matter of Chapter 9.

These key chapters are bordered by brief expositions of some related issues. First, what non-biological, clinical and epidemiological data are suggestive of a causative role of life events in depression (Chapter 4). Next the question is raised how life events are defined and assessed, including their emotional impact (Chapters 2 and 3). With regard to the biology of depression the discussion on MAergic disturbances is complemented by a chapter on the genetics of depression (Chapter 5) and on interactional relationships between genes and environmental variables (Chapter 6). Since depression is the psychopathological construct central to this discourse, Chapter 1 was included, discussing the way depression is and could be diagnosed.

Finally, since diagnosis – i.e. the precise definition of the object of study – is the very bedrock of psychiatric research, particularly brain and behaviour research, a discussion is included on ways to refine psychiatric diagnosing, in order to make the search for biological determinants of psychopathological constructs more productive (Chapter 9).

This book, thus, is structured around three major themes: the pathophysiological role of stress in depression; the question whether a subtype of depression exists, being particularly stress-inducible; and, finally, the dilemma of diagnosing depression in a way to meet best the requirements of research into its biological underpinnings.¹

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¹ Chapters 5 and 6 were written by van Os, Chapter 8 by de Kloet and van Praag, the remaining chapters by Van Praag.