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Introduction to the 1st Edition

The study of interactions between the immune and neuroendocrine systems is a currently popular and rapidly advancing field which had its foundation in anecdotal observations of the association between 'personality' and disease. A measure of scientific credence was afforded to the area by the observation that, like many other physiologic responses, immune reactions could be conditioned in a classical Pavlovian fashion [1]. A possible mechanism was then found in Selye's [2] observation of thymic involution during 'stress'. The concept of the effects of stress on immunity turned out to be a two-edged sword. On the one hand, it provided a molecular basis, in the form of adrenal glucocorticoids, for neuroendocrine control of immunity. On the other hand, it led to the general and often currently held notion that steroid hormones are the sole players in neuroendocrine modulation of the immune system. Of course, recent studies have shown that this is clearly not the case since stressed adrenalectomized animals are functionally immunosuppressed [3]. Another impediment to the development of the area was the ability to have immunologic responses proceed in vitro. This inadvertently led to the idea that the immune system is a totally autonomous and self-regulating unit. If this were the case, then the immune system would be unlike all other organ systems. Furthermore, this view overlooks the rich hormonal milieu in which many in vitro immune responses occur. The end result of this series of events is the thought that if immune neuroendocrine interactions occur, they are mediated by steroid hormones. The picture has been further clouded by the predominance of studies of the psychological aspects of immune neuroendocrine interactions. Though it is not necessarily our view, such studies have given the field an aura of being a 'soft' science, thus the intent of *Neuroimmunoendocrinology* is to highlight the cellular and molecular aspects of this field.

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3 Keller SE, Weiss JM, Schleifer SJ, Miller NE, Stein M: Stress-induced suppression of immunity in adrenalectomized rats. Science 1983;221:1301–1304.

J. Edwin Blalock, PhD, Department of Physiology and Biophysics,
University of Alabama at Birmingham, Birmingham, AL 35294-0005 (USA)

Introduction to the 2nd Edition

In the 3 years since the first publication of this volume, we have witnessed an explosion of information on immune neuroendocrine interactions. This has been evidenced by numerous international congresses, the inclusion of many symposia at the annual meetings of immunology, endocrinology, and neuroscience societies and the initiation of at least two new journals on the subject (i.e., *Progress in NeuroEndocrinImmunology* and *Advances in Neuroimmunology*). Among the highlights which have fueled the scientific growth of this discipline are: the tremendous increase in the number of neuroendocrine hormones and peptide neurotransmitters as well as their receptors which are endogenous to the immune system; the finding of cytokines such as IL-1 and IL-6 as well as their receptors in neural and endocrine tissues; and the profound effects of bidirectional communication between the immune and neuroendocrine systems on an animal's physiology. As an example, it is interesting to note that IL-1 is probably a more potent activator of the hypothalamic pituitary adrenal axis than is corticotropin releasing factor (CRF). Thus the paradox that without knowing it immunologists discovered a most potent 'hypothalamic releasing factor'. Contrariwise, CRF is a very effective inducer of IL-1. Thus, endocrinologists without knowing it discovered a cytokine. Such are the strange but exciting ironies of the development of a new discipline.

As a result of the great accumulation of new knowledge and the overwhelming success of the first edition, myself, and the coauthors have written

the present revised edition of *Neuroimmunoendocrinology*. Once again, the emphasis is on the molecular, cellular, and physiologic aspects of immune neuroendocrine interactions. Because of the expansion of the literature in this area, most chapters and bibliographies are longer. It is our fondest hope that this volume will be a valuable resource to the evolution of this exciting new discipline.

J. Edwin Blalock, PhD, Department of Physiology and Biophysics,
University of Alabama at Birmingham, Birmingham, AL 35294–0005 (USA)