Editorial

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The papers combined in this issue of *Neuropsychobiology* were given at an International Symposium on Psycho-biology the goal of which was to focus on the joint investigation of psychophysiological parameters such as EEG, sensory and neuronal processes, or measures of the auto-nomic nervous system on the one hand and endocrinolog-ical, neurotransmitter-related, and immunological measures on the other, obtained from the same individuals, preferably combined with psychological data related to aspects of behavior (fig. 1).

Every paper combines several relationships depicted (1) to (9) and variables characterized by letters in each section in the figure. These numbers will be found behind the titles of papers given in the table of contents at the end of the introduction.

The endeavor to group the papers according to a common principle was, of course, difficult since a three-dimensional grouping system would have had to be followed: according to subjects investigated (animals, healthy subjects, or patients), the fact if a stressor had

Fig. 1. Relationships between different fields of research combined in the papers of the Symposium on Psychobiology.

Immune System I

Humoral System (a) Cellular System (b)

Tf@

COIt

Physiology III

CNS: EEG, ERP (a)

Cellular discharge (b) Periphery: Cardiovascular system (c) Temperature (d)

Endocrine Systems II

CNS: TRH, CRH(a)

Periphery: Cortisol (b)

Gonadal (c) and

Thyroid (d)

hormones

Catecholamines (e)

Table 1. Authors, titles, and psychobiological relationships and variables investigated

Authors

Relationships and variables investigated according to figure 1

1 *Psychobiological indicators of psychiatric vulnerability and personality type*

Krieg JC, Lauer CJ, Schreiber W, Holsboer F*	Psychometric, neuroendocrine, and polysomnographic findings in subjects at high risk of psychiatric disorders	
Hohagen F, Timmer J, Weyerbrock A, Fritsch-Montero R, Ganter U, Krieger S, Berger M, Bauer J	Cytokine production during sleep and wakefulness and their relation	Gallhofer B, Gruppe H, Jantscher M Wittling W, Schweiger E Zuckerman M
		Rammsayer T, Hennig J, Bahner E, von Georgi R, Opper C, Fett C, Wesemann W, Netter P
Warburton DM, Rusted JM		
Stemmler G		
Lehnert H, Nink M, Mann K, Roschke J, Hellhammer D		

2 *Psychobiology of effects induced by chemical substances in humans and animals*

Hinckel P, Brück K* SabelIB, AschoffA	
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to cortisol

Psychophysiology, psychoneuroendocrinology, and the laterality concept of the brain

Alterations of neuroendocrine brain asymmetry: A neural risk factor affecting physical health

P-impulsive sensation seeking and its behavioral, psychophysiological and biochemical correlates

Lowering of body core temperature by exposure to a cold environment and by a 5-HT_{1A} agonist: Effects on physiological and psychological variables and blood serotonin levels

Neurochemical control of cognitive resources

Receptor antagonists as tools for structural measurement in psycho-physiology

Extrapituitary effects of corticotropin-releasing hormone (CRH) and thyrotropin-releasing hormone (TRH)

Effect of steroids on lower brain stem thermoresponsive neurons

Functional and morphological recovery after injury to the optic nerve

6,8,10
IIa, b, IIIa, IVe
3,8
Ia, IIb, IIIa
8
Ha, b, c, d, IIIa
10
IIb, IVc, e
4,5,6
IIb, c, IIIa, IVc, V
5,6,7,8
IIb, IIIc, d, IVb, V
4,7
IIIa, IVc, V
6,7
IIIc, d, IVb, e
5,8,10
IIa, b, d, e, IIIa, c, IVd, V
5,7,8
IIc, IIIb, d, V
4 IVd, V

Paper not included in this issue of *Neuropsychobiology*.

been applied, and if so what kind (chemical, physiological, or psychological), and the sets of variables chosen for investigation as indicated in figure 1. Therefore, the final solution of grouping the papers on the program shows overlap between categories to a certain degree. Yet, in order to give the reader an impression of the scope of the symposium, the complete list of titles as grouped in the symposium is given below. The principle followed was: (1) Papers the major aim of which was to identify markers of vulnerability to psy-

chiatric or psychosomatic diseases (Krieg et al., Gallhofer et al., Wittling and Schweiger) or characteristics of personality types (Zuckerman) or to perform research in a psychiatric setting under natural nonstimulus and non-challenge conditions (Hohagen et al.). (2) Studies in which chemical substances or hormones were applied as research tools for elucidating biological mechanisms in healthy humans (Rammsayer et al., Warburton and Rusted, Stemmler, Lehnert et al.) and animals (Hinckel and Brück, Sabel and Aschoff). (3) Papers that investi-

Relationships and variables investigated according to figure 1

3 Psychobiology of stress and coping behavior in humans

Ursin H, Olff M Psychobiology of coping and defence

Veltman JA, Gaillard AWK

Voigt KH, Rapp K, Schmidt A, Lyncker C*

Kirschbaum C, Pirke K-M, Hellhammer DH

Hennig J, Laschefschi U, Becker H, Rammsayer T, Netter P

Schedlowski M, Tewes U, Wagner TOF, Schmidt RE

Indices of mental workload in a complex task environment

Individual stress reactions in man

The ‘Trier Social Stress Test’ (TSST): A tool for investigating psycho-biological stress responses in a laboratory setting

Immune cell and cortisol responses to physically and pharmacologically induced lowering of body core temperature

Parachuring stress: Effects on neuroendocrine and cellular immune functions

1,10
b, b, c, e, Va, b, e

6,10
b, I c, IVc

1,6,10
b, a, b, c, c, IVb, e

6,10
a, b, c, IVb, e

1,3,6,8,9,10
a, b, b, I c, d, IVb

3,10
b, a, b, c, d, e

4 *Psychobiology of stress and coping in animals and basic mechanisms of immune responses*
Wesemann W, Clement HW, Gemsa D, Hasse C, Heymanns J, Pohlner K, Schäfer F, Weiner N
Bohus B, Koolhaas JM, Heijnen CJ, de Boer O
Cools AR, Rots NY, Ellenbroek B, de Kloet ER

Besedovsky HO, del Rey A*

Zeisberger E, Roth J

Felten DL

Immobilization and light-dark cycle induced modulation of serotonin metabolism in rat brain and lymphocyte subpopulations – in vivo voltammetric and FACS analyses

Immunological responses to social stress: Dependence on social position, coping strategy, and social environment

Bimodal shape of individual variation in behavior of Wistar rats: The overall outcome of a fundamentally different make-up and reactivity of the brain, the endocrinological and the immunological system

Cytokines as mediators of immune neuroendocrine interactions

Neurobiological concepts of fever generation and suppression

Direct innervation of lymphoid organs: Substrate for neurotransmitter signalling of cells of the immune system

1,2,4 Ib, IVd, V

1
Ib, IVa, d

1,2,4,5,10
Ib, Ib, e, IVb, d, e, V

2,3,5
Ia, b, Ia, b, c, V

2,3
Ia, b, Id

2,3 Ia, b, He

Paper not included in this issue of *Neuropsychobiology*.

gated psychological or physiological stressors or experiences and coping processes in humans (Ursin and Olff, Veltman and Gaillard, Voigt et al., Kirschbaum et al., Hennig et al.; Schedlowski et al.). Most of these are concerned with the immune system, which they have in common with (4) the fourth group, in which similar kinds of stressors are applied to animals. In this group the immune system is the major object of investigation with the papers by Bohus et al. and Cools et al. centering on behavioral aspects, while those by Wesemann et al., Besedovsky and

del Rey, and Zeisberger and Roth, moving away from behavior, emphasize the molecular level (the last two rather applying immunologically active substances instead of behavioral stressors).
Finally, a broad bridge between behavior, immunology, and the central nervous system is represented by the contribution of Felten, given as a separate evening lecture. It will be noticed that some papers rather have the character of review articles incorporating a few new find-

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ings or models into reports about previous research in the authors' groups, like the ones by Zuckerman, Warburton and Rusted, Ursin and Olff, Lehnert et al., Kirschbaum et al., and Cools et al., while others represent results from individual experiments like Hohagen et al., Veltman and Gaillard, Hennig et al., Rammsayer et al., and Wesemann et al.
Unfortunately, some of the papers are not included, which is either due to the fact that they had been published previously or to problems of time of submission and reviewing process or length of the contribution, which make a separate publication in a different issue necessary. These papers are marked in table 1 by an asterisk.
Although only a few papers followed the primary aim of the symposium to establish causal links between electrophysiological and chemical (endocrine or immune system) responses, the subsequent discussion chaired and structured by Erdmann and Janke was valuable in eluci-

dating some leading ideas and problems inherent in psychobiological research, such as: (1) how to choose the right biological parameters to reflect behavior; (2) how to establish causal instead of mere correlational relations between these parameters and behavior; (3) how to cope with the different time gradients of these parameters when evaluating relationships; (4) how to generalize results across conditions (different drugs or stressors) and populations (patients, healthy subjects, different species). (5) Furthermore, the consideration of individual differences in re-sponsivity was demonstrated to be essential not only in humans but also in animal research (Cools et al.). Finally, the large number of papers concerned with the relationships between brain, endocrine and immune system emphasizes the growing significance of psychoneuro-immunology for understanding psychobiological relationships.