9th Meeting of the German Endocrine-Brain-Immune Network (GEBIN)

The 9th Meeting of the German Endocrine-Brain-Immune Network (GEBIN) was held together with the 8th Meeting of the International Society for NeuroImmunoModulation (ISNIM) in Dresden at the Westin Bellevue Hotel on the banks of the river Elbe. It was an outstanding location for the meeting, not only because the hotel is located close to the point that served Bernardo Bellotto to paint his famous view over Dresden (Canaletto View).

Over three meeting days, cutting-edge research was presented in eight sections, three symposia and a poster session. Attendees came from as much as 23 countries and five continents. In the following paragraphs, each session of the meeting is briefly summarized.

Section 1: Endocrine Components of Infectious and Autoimmune Diseases
The first talk was given by the invited speaker O. Bottasso (Rosario, Argentina), highlighting hormonal and immunological changes in tuberculosis patients. The plenary talk was followed by selected presentations, which, for example, pointed out that the anabolic hormones DHEA and IGF-1 may ameliorate cognitive health in elderly persons (R. Emeny, Munich, Germany), and that the serotonin antagonist tropisetron may be useful in scleroderma, an effect, which is not mediated via serotonin receptors, and which may increase the therapeutic potential of this drug (A. Kokot, Münster, Germany).

Section 2: Focus on Peripheral Immune-Neural Interactions
An initial invited talk was given by K. Kawashima (Tokio, Japan) focussing on the role of acetylcholine in immune effector cells, in which, via classic, "neuronal" ACh receptors cytokine expression is regulated. Additionally, short selected presentations were given, in which the impact of sympathetic and parasympathetic transmission in immune cells for diseases such as rheumatoid arthritis and inflammatory bowel disease, and Trypanosoma infections were discussed. Additionally, the role of glucocorticoids and cannabinoids were discussed.

An interesting, high-quality **Poster Session** with more than 80 posters was followed by

Section 3: The Brain in NeuroImmunoModulation
The invited talk from the group of G. Kempermann was focussing on the role of the immune system in neurogenesis. It is increasingly recognized that cytokines serve as important modulators of neurogenesis. Additional interesting presentations discussed the role of cytokines during neuropathic pain, which is correlated with IL-1β expression and the impact of T cell function for sleep and sympathetic transmission.

Section 4: Selected Aspects of Neuro-Immuno-Modulation and Disease (I)
As an introduction to the topic the link between immune effector cell function and metabolic disorders was presented in the invited talk. Other talks focussed on the roles of immune functions in memory (B. Linz, Lübeck, Germany), and the detrimental effects of the IL-23/Th-17 system in atherosclerosis (R. Businaro, Roma, Italia). In addition, papers were given on regulatory factors which modulate immune functions such as opioids, which inhibit the proinflammatory transcription factor NF-κB (J. Kraus, Magdeburg, Germany), COMT (K. Müller, Würzburg, Germany), and NGF, which inhibits monocyte functions (L. Bracci-Laudiero, Roma, Italia).

Section 5: Stress, Behavior and Immunity
In this section, it was demonstrated how complex the three factors stress, behavior and immunity are interconnected and regulated by each other. Just to mention an example, it was interesting to learn that

posttraumatic stress (e.g., after war experience) induced molecular changes resulting in a decreased DNA repair capacity of immune cells (I.T. Kolassa, Ulm, Germany).

Section 6: Psychiatric Diseases and Neuro-Immuno-Modulation
In this section, novel, and also molecular aspects were presented that underlined the concept that psychiatric diseases such as schizophrenia and depression is significantly associated with an imbalanced immune response during early development. On the other hand, however, there is also increasing evidence for the concept that modulation of the neuroimmune response, e.g., by physical exercise, may ameliorate distinct symptoms in distinct disorders, as pointed out by M.J. Schwarz (München, Germany).

Symposium: Peripheral Inflammation and CNS Interactions: IL-6 as an Example
In interesting plenary talks multiple consequences of inflammation on rheumatoid arthritis, on sleep and recreation, and on psychosocial factors were discussed. In particular, the use of novel biologicals, i.e. drugs that are humanized antibodies (e. g. tocilizumab, which targets IL-6), was highlighted (M. Aringer, Dresden, Germany). In modern pharmacology, these biologicals are somewhat "Janus headed" drugs: they are on the one hand very promising towards the treatment of a bulk of different disorders such as rheumatoid arthritis, but nevertheless, on the other hand, bear several risks, since they also decrease or abrogate plenty of positive effects of their target molecules.

Section 7: Selected Aspects of Neuro-Immuno-Modulation and Disease (II)
In this section, which is the second part to section 4, the role of the immune system in the pathophysiology of chronic pain and fatigue was presented. In particular, investigations on the transition from acute to chronic pain, which is an important, but unresolved issue, were presented by A. Kavelaars (Utrecht, The Netherlands). In this scenario, dysregulation of the immune system seems to result in excessive glial activity, which is a key factor for proalgetic effects.

Symposium: The Immunoregulatory Role of the Pituitary Gland
This symposium was organized and presented by members of the Mexican Branch of the ISNIM. Various immunoregulatory effects of pituitary hormones and their physiological as well as pathophysiological consequences were presented, underlining the importance of the multiple immuno-endocrine-interactions.

Symposium: The Neuro-Endocrine-Immunology of the Thymus
This symposium covered novel aspects on thymus physiology, in particular on the problem of "self" and "non-self" recognition, which may have significant input for future treatment of autoimmune diseases (V. Geenen, Liege, Belgium). Also, the regulation of the thymus and T cells by growth hormone (W. Savino, Rio de Janeiro, Brazil) and novel aspects on the role of the thymus in Trypanosoma infections (A.R. Perez, Rosario, Argentina) was presented.

Section 8: Neuro-Immuno-Modulation Perspectives
In the last plenary talks, the importance of the multiple neuro-immuno-endocrine-interactions, and the necessity of a better knowledge of such interactions was again strengthened by demonstrating their fundamental roles in the physiological functioning of an organism, and in very diverse disorders ranging from psychological disorders like depression and schizophrenia to bacterial infections.

In conclusion, all contributions to this congress made well clear that a narrow look on a single supersystem only, such as the immune system or the nervous system, will not be sufficient to satisfactorily explain a bulk of observations made in the last years. In contrast, the study of neuro-immuno-endocrine-interactions, which was the topic of this meeting, enables those being basic researchers to better understand the multiple links between the supersystems, and thus these systems themselves, and those being in charge of patients to explore novel and promising approaches for the treatment of distinct disorders.

Along with its perfect organization by Clemens Kirschbaum (Technical University Dresden) and Stefan Bornstein (University Hospital Dresden), this outstanding meeting was a big success.

Jürgen Kraus for the GEBIN Steering Committee