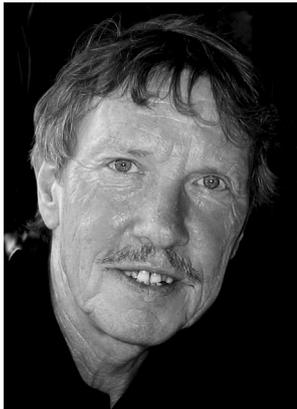


Towards new frontiers in neuroendocrinology: A tribute to Peter H. Seeburg

Valery Grinevich¹ · Gustav F. Jirikowski²

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Peter H. Seeburg (by courtesy of Valery Grinevich)

This special issue of Cell and Tissue Research is dedicated to the memory of one of the pioneers in molecular neuroendocrinology, Peter H. Seeburg who passed away much too early in 2016. At age 72 he was still in the midst of amazingly creative work. He had received highly prestigious awards and numerous grants, published more than 350 original papers and had filed an impressive number of patents. John Adelman (2018) describes in a rather personal report the ground breaking experiments he did with Peter H. Seeburg on GnRH during his time as a postdoctoral fellow at the University of California in San Francisco and as Director

of Research of Genentech. Daniel Spergel (2018) provides here an update on GnRH neurons in reproductive functions.

Peter H. Seeburg performed ground breaking work on the functional properties of glutamate receptors as Professor at the ZMBH of the University of Heidelberg. As Director of the Department of Molecular Neurobiology, (Max Plank Institute for Medical Research, Heidelberg) Peter H. Seeburg was one of the first scientists to study the importance of glutamate receptors for learning and memory. For this project he generated and established innovative transgenic mouse models. During the last decade his special interests focused on neuropeptides, their receptors and their functional meaning. This is the main emphasis of this special issue of CTR. Bice Chini (2018) reviews neuropeptide receptors in the CNS. There are reviews on neuropeptide signaling in the cerebral cortex (Valtcheva and Froemke 2018), in the central nucleus of the amygdala (van den Burg and Stoop 2018) and in the spinal trigeminal nucleus (Carr and Frings 2018). Lefevre et al. (2018) report about fMRI studies of neuropeptide action in humans.

Among the factors most interesting to Peter H. Seeburg were hypothalamic peptide hormones. Here, Winter and Jurek (2018) report about oxytocin receptor-mediated signaling in mammalian brain, Jirikowski (2018) describes the diversity of the central oxytocinergic projections and Ueta and Yoshimura (2018) report advanced genetic and viral methods for labelling and manipulation of oxytocin and vasopressin neurons.

Naturally the functional importance of neuropeptides includes control of mood and behaviors. Mike Ludwig's paper (2018) is on vasopressin modulation of olfactory and visual processing. Eiden and Zhang (2018) report how PACAP and AVP modulate motivated behavior. Najam et al. (2018) describe how hypothalamic circuits control hunger and satiety. Adaptive fear and destructive anxiety may in part be influenced by corticotropin-releasing factor (Janeček and Dabrowska 2018) and urocortins (Wagner 2018). Neuropsychiatric disorders may be influenced by hypothalamic peptides (Bernstein et al. 2018). Herbeck and Gulevich (2018) report how neuropeptides facilitate domestication.

✉ Valery Grinevich
v.grinevich@dkfz.de; http://www.cellnetworks.uni-hd.de/353103/personal_data

¹ German Cancer Research Center, Central Institute of Mental Health Cell Networks Cluster of Excellence, University of Heidelberg, Im Neuenheimer Feld 581 (TP4), Office 3.301, D-69120 Heidelberg, Germany

² Department of Anatomy II, Jena University Hospital, Jena, Germany

Even the structural integrity of brain circuits may depend on hypothalamic peptides. Hagiwara et al. (2018) describe novel mechanisms of death of vasopressin neurons causing diabetes insipidus.

Other neuropeptides seem to be further players in the central control of behaviors. Grund and Neumann (2018) report about brain neuropeptide S, which is a powerful neuromodulator of emotional behaviors and body homeostasis. Other important neuropeptides in the brain include Urocortin (Wagner 2018), prolactin, (Carretero et al. 2018), substance P (involved in chronic pain; Zieglgänsberger 2018) and endogenous opioids (Brunton 2018).

Neuropeptides may be capable of crossing the blood brain barrier (Lee and Jayant 2018). They are likely to influence brain development and regeneration (Nagpal et al. 2018; Alvarez-Bolado 2018). New therapeutic options that include stem cells may be available for treatment of human neuroendocrine disorders (Suga 2018).

Peter H. Seeburg will be remembered as one of the fathers of modern neuroscience. His contributions made molecular neuroendocrinology an expanding field with great implications for basic neuroscience and also for new developments in clinical neuropharmacology.

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