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INTRINSIC ACTIVITY

Joint Meeting of the Austrian Neuroscience Association (16th ANA Meeting) and the Austrian Pharmacological Society (25th Scientific Symposium of APHAR)

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MEETING ABSTRACT

A1.2

The mammalian hypothalamus: cellular diversity for functional multiplicity

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Background: The mammalian hypothalamus contains an amazing variety of neuroendocrine cells that orchestrate bodily adaptations to environmental changes and challenges. The hypothalamus is unique in that neurons can code more than one neurotransmitter and switch between their uses in a state- and connectome-specific manner. Moreover, neuroendocrine cells (except some glutamate subtypes) contain at least one neuropeptide that is co-released with the primary fast neurotransmitter. By now, a direct and precise pairing of neuropeptides–neurotransmitters is available and allows the hierarchical mapping of hypothalamic neuroendocrine singling and function determination.

Methods: While eminent studies have identified and linked many of the neuroendocrine command modules to specific bodily states and behaviours over the past decades, it was the introduction of single-cell technologies, particularly transcriptomics combined with opto-/chemogenetic probing, that led to establishing causality between neuronal (and glial) cell types and specific neuroendocrine outputs.

Results: Given these advances in molecular neuroendocrinology, Austrian and international speakers will provide snap-shots of the state of the art; ranging from cell classification to neuropeptide functions and disease-induced (gender-specific) hypothalamic pathologies. In particular: Barbara Kofler (Paracelsus Medical University) will discuss the role of the galanin peptide system in behavior, food intake, metabolism and inflammation. Alán Alpár (Semmelweis University) will outline novel mechanisms of stress-induced cortical sensitization, while Solomiia Korchynska (Medical University of Vienna) will report on both the anatomical and functional diversity of hypothalamic dopamine neurons.

Discussion: Thus, this symposium will highlight novel organizational features of the hypothalamus including the development, use and pathological modifications of its neurotransmitter and neuropeptide systems.

Keywords: Ca^{2+}-binding and sensor proteins – hypothalamic hormones – neuronal identity – neuropeptides

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