

Joint Meeting of the Austrian Neuroscience Association (16th ANA Meeting) and
the Austrian Pharmacological Society (25th Scientific Symposium of APHAR)
Innsbruck, 25–27 September 2019

MEETING ABSTRACT

A3.24

Heterocyclic modafinil analogue CE-123 as novel improves spatial memory in hole-board task of aged male Sprague-Dawley rats

Ahmed M. HUSSEIN^{1,2}, Predrag KALABE³, Thomas HUMMEL¹ and Gert LUBEC^{4,*}

¹Department of Neurobiology, University of Vienna, Austria;
²Zoology Department, Faculty of Science, Al-Azhar University, Assiut, Egypt; ³Department of Pharmaceutical Chemistry, Faculty of Life Sciences, University of Vienna, Austria; ⁴Neuroproteomics, Paracelsus Private Medical University, Salzburg, Austria

Background: Dopamine reuptake inhibitors have been shown to improve cognitive parameters in various tasks and animal models. Modafinil is a wake-promoting compound with high potential for cognitive enhancement. It is targeting the dopamine transporter (DAT) with moderate selectivity, thereby leading to reuptake inhibition and increased dopamine levels in the synaptic cleft. A series of modafinil analogues has been reported so far, but more target-specific analogues remain to be discovered. A longer life not always corresponds to a healthier life. Indeed, aging is associated with growing risk factors for illness associated with societal conditions (isolation, maltreatment), and neurodegenerative diseases. Even normal aging is associated with a cognitive decline that can hinder independence and quality of life of the elderly. It was therefore the aim of the study to synthesize and test a novel heterocyclic compound for cognitive enhancement in a paradigm for reference memory. The new cognitive enhancer is a specific and effective dopamine reuptake inhibitor of DAT.

Methods: The reference memory index (RMI) was evaluated in aged 24-month-old male Sprague-Dawley rats that were intraperitoneally injected with CE-123 (10 mg/kg body weight). In order to evaluate spatial memory the hole-board test was carried out as pro-cognitive effect evaluation.

Results: CE-123 enhances memory acquisition and memory retrieval, represented by significantly increased reference memory indices and shortened latency.

Discussion: CE-123 as a specific reuptake inhibitor was shown to increase performance (RMI) and maybe modulated the dopaminergic system which is proposed as a possible mechanism of action.

Keywords: DAT inhibitor – dopamine – spatial memory – modafinil – aged Sprague-Dawley rats

*Corresponding author e-mail: gert.lubec@pmu.ac.at