

Poster presentation

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## DHEAS and cortisol correlate with Hypothalamic Serotonin-1A Receptors

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from International Society on Brain and Behaviour: 3rd International Congress on Brain and Behaviour  
Thessaloniki, Greece. 28 November – 2 December 2007

Published: 17 April 2008

*Annals of General Psychiatry* 2008, **7**(Suppl 1):S220 doi:10.1186/1744-859X-7-S1-S220

This abstract is available from: <http://www.annals-general-psychiatry.com/content/7/S1/S220>

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### Background

Serotonin modulates the activity of the hypothalamic-pituitary-adrenal (HPA) axis, to a big part through the serotonin-1A receptor (5-HT<sub>1A</sub>) [1]. In return, hormones of the HPA axis, namely dehydroepiandrosterone sulfate (DHEAS) [2] and cortisol have regulatory effects on the serotonergic neurotransmission.

### Materials and methods

Eighteen healthy female subjects participated in this PET study. The selective 5-HT<sub>1A</sub> receptor antagonist [carboxyl-<sup>11</sup>C]WAY-100635 was used as radioligand. The hypothalamus as an essential part of the HPA axis and eight control regions of interest and the cerebellum as reference region were defined a priori and delineated on co-registered MR images. DHEAS and cortisol plasma levels were ascertained by morning blood collections on the PET day. The 5-HT<sub>1A</sub> receptor binding potentials of the target brain regions were correlated with DHEAS, cortisol plasma levels and the ratio of DHEAS / cortisol.

### Results

We found highly significant correlations between the hypothalamic 5-HT<sub>1A</sub> receptor binding and DHEAS ( $p=.003$ ) and the ratio of DHEAS / cortisol ( $p<.0001$ ), but not with cortisol and not in other brain regions.

### Conclusions

The 5-HT<sub>1A</sub> receptor may influence the DHEAS plasma level by modulating CRH and ACTH release as reported for cortisol before [1]. Vice versa, the interaction of cortisol and DHEAS may exert a regulatory effect on the 5-HT<sub>1A</sub> receptor distribution in the hypothalamus as a feedback loop. As disturbances of the HPA axis [3] as well as changes of the 5-HT<sub>1A</sub> receptor distribution [4] have been reported frequently in affective disorders, future studies should aim their focus on these interactions.

### Acknowledgements

This research was supported by grants from the Austrian National Bank (OENB PI 1468) and the Medical Science Fund of the City of Vienna (BMF P2515) to R. Lanzenberger, and a grant from the Austrian Science Fund (FWF PI 6549). The authors are grateful to J. Tauscher, C. Windischberger, A. Becherer, N. Praschak-Rieder, L. Pezawas, M. Willeit, M. Fink, D. Ettlinger, T. Attarbaschi, S. Friedreich, E. Moser, and R. Dudczak for their scientific, medical or administrative support.

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