ADDRESS COLLOQUIA

Venue: Medical University Vienna, Center for Physiology and Pharmacology,
Institute of Pharmacology, Conference room, 3rd floor
Waehringerstrasse 13a, 1090 Vienna,
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Thursday 23.11.2017 12.00 s.t. Host: H. Sitte

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"In vitro pharmacology of methylphenidate-based new psychoactive substances"

Abstract:
Methylphenidate-based designer drugs are new psychoactive substances (NPS) that are used outside medical settings. Currently, the pharmacology of such NPS is largely unexplored and knowledge of their effects is almost solely based on user reports and clinical case reports of intoxication. Assessing the pharmacological profile of NPS in vitro is an initial step to gain a better understanding of the potential clinical effects and toxicology of these substances. In a recent study of our group, we therefore determined the potencies of various methylphenidate-based NPS with respect to norepinephrine, dopamine, and serotonin transporter inhibition in transporter-transfected human embryonic kidney 293 cells. We also investigated monoamine efflux and monoamine receptor and transporter binding affinities. All methylphenidate-based substances inhibited the norepinephrine and dopamine transporters 4 to >1,000-fold more potently than the serotonin transporter. Similar to methylphenidate and cocaine, methylphenidate-based NPS did not elicit transporter-mediated efflux of monoamines. Besides binding to monoamine transporters, several test drugs had affinity for adrenergic, serotonergic, and rat trace amine-associated receptors but not for dopaminergic or mouse trace amine-associated receptors. To conclude, methylphenidate-based substances had pharmacological profiles similar to methylphenidate and cocaine. The predominant actions on dopamine transporters vs. serotonin transporters may be relevant when considering abuse liability.

Short CV:

Dino Lüthi graduated from the University of Basel with a Bachelor's degree in Pharmaceutical Sciences and a Master's degree in Toxicology. After a one-year internship in a bioanalytical laboratory at the University of Utrecht, he returned to Basel and joined the Clinical Pharmacology and Toxicology research group at the University Hospital Basel. As part of his PhD studies, he currently focuses on the hepatotoxicity and pharmacology of new psychoactive substances.