

Publication**Altered prefrontal connectivity after acute heroin administration during cognitive control****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 3720866**Author(s)** Schmidt, André; Borgwardt, Stefan; Gerber, Hana; Schmid, Otto; Wiesbeck, Gerhard A.; Riecher-Rössler, Anita; Bendfeldt, Kerstin; Smieskova, Renata; Lang, Undine E.; Rubia, Katya; Walter, Marc**Author(s) at UniBasel** [Schmidt, André](#) ; [Riecher-Rössler, Anita](#) ;**Year** 2014**Title** Altered prefrontal connectivity after acute heroin administration during cognitive control**Journal** International Journal of Neuropsychopharmacology**Volume** 17**Number** 9**Pages / Article-Number** 1375-85**Mesh terms** Adult; Analgesics, Opioid, administration & dosage; Bayes Theorem; Cognition, drug effects; Cross-Sectional Studies; Double-Blind Method; Female; Heroin, administration & dosage; Heroin Dependence, pathology; Humans; Image Processing, Computer-Assisted; Inhibition (Psychology); Magnetic Resonance Imaging; Male; Middle Aged; Models, Neurological; Neural Pathways, drug effects; Neuropsychological Tests; Oxygen, blood; Prefrontal Cortex, drug effects

Neuroimaging studies have reported reduced activity in a broad network of brain regions during response inhibition in heroin-dependent patients. However, how heroin in an acute dose modulates the neural correlates of response inhibition and the underlying brain connectivity has not yet been investigated. In this double-blind placebo-controlled study, we used functional magnetic resonance imaging to examine whether acute heroin administration changed whole brain activity during response inhibition in 26 heroin-dependent patients. We then applied dynamic causal modelling to investigate the effect of an acute dose of heroin on the functional interactions between the dorsal anterior cingulate cortex (dACC) and the bilateral inferior frontal gyri (IFG). Heroin acutely reduced dACC activity, as well as the inhibition-induced modulation of connectivity from the dACC to the right IFG compared with placebo. Furthermore, dACC activity was positively related to false alarm rates after placebo but not heroin administration. These results suggest that acute heroin administration impairs cognitive control in dependent patients by reducing the activity in the dACC activity and the functional connectivity from the dACC to the right IFG.

Publisher Oxford University Press**ISSN/ISBN** 1461-1457 ; 1469-5111**URL** <http://www.ncbi.nlm.nih.gov/pubmed/24641978>; <http://journals.cambridge.org/action/displayAbstract?fromPage=or>
edoc-URL <https://edoc.unibas.ch/63088/>**Full Text on edoc** Available;**Digital Object Identifier DOI** 10.1017/S1461145714000297**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/24641978>**ISI-Number** WOS:000340409100004**Document type (ISI)** Journal Article, Randomized Controlled Trial