Addiction research uncovers potential of social interaction

July 11 2016

Animals prefer contact with other animals rather than drug consumption. – This has been shown by neuroscience studies providing first-time evidence of the positive impact of social interaction and opening up new therapeutic avenues.

After talking things over with one's best friend, the world is a happier place again. – People who have made this experience know just what positive effects social interaction can have on one's sense of well-being. Researchers from Innsbruck now set out to conduct neurological investigations to establish how much potential there really is in social interaction with one's peers. Using animal tests, the neurobiologist Rana El Rawas and fellow researchers Gerald Zernig and Alois Saria from the Medical University of Innsbruck have already been able to demonstrate the positive effect of social interaction with respect to drug dependence.

Natural rewards are stronger

In sophisticated test arrays, El Rawas, Junior Researcher at the Experimental Psychiatry Unit, studied what happens in certain areas of the brain in cases of drug consumption or social interaction. It has been shown that almost the same areas in the brain's reward centre are activated in both cases. As the experiments have proven, the effect of social interaction was so strong that it could even result in erasing the addiction memory. When given a choice, the cocaine-dependent animals increasingly preferred animal companions over drugs. "Our current

research focus aims at investigating the effect of social interaction at molecular level in order to help drug dependent persons in finding a way out of addiction through positive social experiences, and we want to use these insights for preventing drug dependence", explains Rana El Rawas.

Innovative approaches

With support from the Austrian science fund FWF, the neurobiologist is now studying the mechanisms underlying the positive effect of social interaction. She explores what signalling pathways are triggered by a natural reward such as "meeting a friend" as opposed to the reward triggered by drug consumption. – With her method El Rawas is pursuing a novel approach shifting the focus from the commonalities to the differences between natural reward and drug reward. The young scholar hypothesises that the two reward systems communicate through different neuronal networks. One of the issues studied by the research team from Innsbruck is the significance of the signalling path of CREB (cAMP response element binding protein), a protein that plays an important role in the effect of drugs. In the process, the scientists also want to find out whether the rewarding effect of social interaction is as persistent as that of drug consumption.

The anti-stress effect

In another ongoing FWF project, El Rawas was able to demonstrate that certain brain areas react to social interaction by a lowered stress response. "Playing with another animal reduces the level of the p38 protein, which increases upon drug consumption but also in response to stress or fear", the scientist elucidates. El Rawas now intends to delve deeper into the anti-stress effect of social rewards by demonstrating the impact of p38 on stress behaviour and dependence disorders and by decoding an even greater number of molecular factors in the brain.

"Apart from facilitating effective approaches in behavioural therapy, these findings could open up new vistas for developing drugs against addiction and other mental disorders", says Rana El Rawas.

More information: Ahmad Salti et al. Social interaction reward decreases p38 activation in the nucleus accumbens shell of rats, *Neuropharmacology* (2015). DOI: 10.1016/j.neuropharm.2015.08.029

Rana El Rawas et al. Preventive role of social interaction for cocaine conditioned place preference: correlation with FosB/DeltaFosB and pCREB expression in rat mesocorticolimbic areas, *Frontiers in Behavioral Neuroscience* (2012). DOI: 10.3389/fnbeh.2012.00008

Brain regions associated with the acquisition of conditioned place preference for cocaine vs. social interaction. El Rawas R, Klement S, Kummer KK, Fritz M, Dechant G, Saria A, Zernig G., in: *Frontiers in Behavioural Neuroscience*, 2012, www.ncbi.nlm.nih.gov/pubmed/23015784

Provided by Austrian Science Fund (FWF)