FENS 2020 Virtual Forum
11-15 July 2020
Organised by the Federation of European Neuroscience Societies (FENS)
Hosted by the British Neuroscience Association (BNA)

12th FENS FORUM OF NEUROSCIENCE

https://forum2020.fens.org/

PRESS RELEASE
EMBARGOED UNTIL MONDAY 13 JULY 2020, 14:30 BST

HIGH BLOOD PRESSURE MEDICINE COULD HELP TREAT DRUG ADDICTION

How memories are updated could be the key to tackling drug addiction, said **Cambridge neuroscientist, Dr Amy Milton** today (Monday 13 July). In her research with rats, it appears that a medicine used to treat high blood pressure, interrupts the memory of situations that trigger the craving for drugs. This could offer a new approach to treating drug addiction.

More than 30 million people around the world have drug use disorders, according to WHO, yet the underlying biology is not well-understood, partly because there are many varying genetic and environmental factors involved. Preventing relapse is one of the most challenging aspects.

"We think that destroying memories that contribute to drug relapse could be a way forward," said Dr Milton, speaking at the FENS Virtual Forum of Neuroscience. "Exposure to people, places and paraphernalia associated with taking drugs influences relapse which can persist for many years. Up to 85% of drug users relapse within the first year of receiving currently available treatments," she explained.

Dr Milton's team have been tapping into the memory updating processes to find out what is going on in the brain. In her laboratory, rats self-administered drugs paired with a cue light, giving them a strong memory of the cue-drug association. In the therapy experiments, they were exposed to the same light cues but not the drug itself, while at the same time receiving propranolol – a beta blocker used to treat high blood pressure - which seemed to interrupt and even block the memory of the drug being associated with the cue.

In separate studies, Dr Milton's team have shown that the updating of the cue-drug memory depends upon a region of the brain known as the amygdala. This almond-shaped structure allows cues in the environment to be associated with outcomes that are motivationally significant to the individual. Other labs have also shown that the amygdala reliably activates in brain imaging studies of addicted patients who are shown videos of people using drugs of abuse. By exploiting memory updating and preventing memory 'restorage' or 'reconsolidation' in this region, the impact of cues on relapse in rats is markedly reduced.

"We are trying to see if we can overwrite the memory during exposure to cues that would have been associated with drug-taking. This prevented relapse in rats for at least one month in the laboratory setting," she said. While Dr Milton and her team are still studying the memory mechanisms of making memories unstable in this way, they suggest that propranolol may act on proteins that make memories last.

Memories are formed and reconsolidated when we recall them. Memories can be undone, even old memories. "It's rather like opening a file in 'read only' mode. But we can also change the file to 'edit' mode and we can even delete the contents. Then we save it. The same is true of

memory, and we are trying to find out more about the 'edit' mode in way we process our memories," she said.

Most drug addiction treatment is based on harm reduction strategies offering management and support to the drug user in a non-judgemental way. Destroying the memories that drive relapse is a very different approach. "It will be very challenging to develop reconsolidation-based interventions to treat addiction, not only pharmacologically, but also the ethics of manipulating memories. But this approach shows promise for translation from the lab to the clinic," Dr Milton concluded.

END

Symposia S32: The eternal sunshine of the spotless mind: recent advances to reduce fear and addictive memories
Abstract: Preventing drug relapse by modifying memories: challenges and opportunities in exploiting reconsolidation to treat addiction

Contact
FENS Press Office and all media enquiries:
Elaine Snell, Snell Communications Ltd, London UK
tel: +44 (0)207 738 0424 or mobile +44 (0)7973 953794
email: elaine@snell-communications.net

NOTES TO EDITORS

Dr Amy Milton, Senior Lecturer, Department of Psychology, University of Cambridge,
https://www.neuroscience.cam.ac.uk/directory/profile.php?alm46

The 12th FENS Virtual Forum of Neuroscience
As a consequence of the COVID-19 pandemic, the FENS Forum 2020 will be held entirely virtually.

The FENS Forum of Neuroscience is the largest basic neuroscience meeting in Europe, organised by the Federation of European Neuroscience Societies and hosted by the British Neuroscience Association. It will attract around 5,000 international delegates. FENS was founded in 1998. With 44 neuroscience member societies across 33 European countries, FENS as an organisation represents 20,000 European neuroscientists with a mission to advance European neuroscience education and research.