MedicalXpress

Researchers explore long-term adolescent vulnerability to drugs

September 16 2009

As part of efforts to understand drug abuse, Georgia State University researchers are finding that adolescent rats appear to be less vulnerable to the long-term effects of withdrawal and relapse in certain types of drug use than rats that take the drugs in adulthood.

The laboratory of Kyle Frantz, associate professor of neuroscience, studied reinstatement of drug seeking in adolescent and adult rats which were given morphine, heroin, and cocaine. Surprisingly, the younger animals were less motivated to seek the drugs after a period of abstinence than the older ones were. The younger rats also showed fewer signs of drug withdrawal.

"The model is important, and the results are interesting because they suggest that younger animals do not show the same level of vulnerability as adults, at least with the drugs and conditions we've tested so far," said Frantz, whose graduate students, James Doherty and Chen Li, and technician Bonnie Williams, conducted the research with help from outstanding GSU undergraduates.

Rats were first given drugs to induce urges to take more of the drug. Rats then pressed levers to receive more drugs, while receiving visual cues like lights and sound. After receiving drugs and then being withdrawn from them, researchers used the cues to see if the rats would reinstate drug-seeking behavior. Researchers found that younger rats were less likely to seek the drugs compared to the adult rats, regardless of which drug they had taken previously.

By better understanding this animal model of drug intake and relapse, scientists have an opportunity to learn how the process works in humans, and may be able to apply the knowledge gained to develop better treatments.

"Regardless of what people do during the teenage years, the question is whether they will transition to adult addicts who will choose drugs over responsibilities like family and work," Frantz explained.

Frantz's lab has received internal grants from Georgia State University and the Medical University of South Carolina to explore the role of plasticity in the brain — the ability of the brain to change in response to different experiences — in long-term drug vulnerability.

Frantz and her researchers also want to look at whether factors such as environmental enrichment are involved. "Environmental enrichment models are relatively easy to apply to the human condition. If animals are less likely to seek drugs after environmental enrichment, then drug treatment and prevention programs should include human challenges such as school, exercise, and interesting social interactions."

Source: Georgia State University (news : web)