

Activating parts of the brain could help alleviate opioid-related social isolation

One of the many painful and challenging aspects of the US opioid crisis is that people abusing opioids often isolate themselves from family and friends, making it difficult for loved ones to help people on a path towards recovery.

Researchers from Arizona State University have identified a region in the brain that may be responsible for opioid-related social isolation, and their work suggests that activating this region could at least partially revive the urge to socialize among opioid addicts.

The research team, led by M. Foster Olive, focused on a brain area called the insula, which has previously been shown to play a role in social, addictive, and empathy-related behaviors. To study its role, the team turned to rats, which like humans are social and enjoy interacting. The researchers paired male rats together and randomly assigned one of each pair to be trapped in a plastic tube in a cage. The other rat in the pair could easily release the trapped animal by pushing on a door. Once a day for three weeks, the rescuer rat had an opportunity to release his trapped cage-mate—and most chose to do so.

The researchers then infused the rescuer rats with a virus that targeted cells in the insula and delivered one of three specialized proteins: one stimulated the cells of the insula; one suppressed those cells' activity; and one was inactive and served as a control. Then they allowed all groups to self-administer heroin because, like humans, rats can become addicted to opioids and will self-administer if given the opportunity.

Finally, the rescuer rats were given a choice between freeing their cage-mates or administering themselves a dose of heroin. Rats given the virus suppressing the activity of cells in the insula, and those in the control group, more often chose heroin over rescuing. But rats infused with the virus that activated the cells started to rescue their friends again; the rescuing behavior recovered by about 30 percent.

The results suggest that the insula plays a role in the antisocial effects of opioid addiction, and these findings may lead to clinical applications, perhaps an adjunct treatment for opioid addiction in humans.

“A good social network is critical for recovery,” says Olive. “If we can stimulate this area of the brain in humans, you might get people to find social interactions more rewarding again. It would be a way to help jumpstart the recovery process. It’s not a cure, it’s just a crutch to help get back on track and give people a better shot a recovery.”

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