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Study provides clues for designing new anti-addiction medications

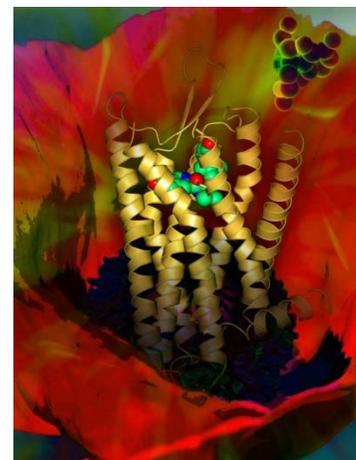
NIH-funded research shows 3D model of activity on key receptor

Scientists are now one step closer to developing anti-addiction medications, thanks to new research that provides a better understanding of the properties of the only member of the opioid receptor family whose activation counteracts the rewarding effects of addictive drugs. The study was supported by the [National Institute on Drug Abuse](#) (NIDA), the [National Institute of General Medical Sciences](#) and the [National Institute of Mental Health](#), all components of the National Institutes of Health.

“Drug abuse and addiction remain devastating public health challenges in the United States,” said NIDA Director Dr. Nora D. Volkow. “This research could aid in the development of effective medications for the treatment of drug addiction, particularly to stimulants like cocaine, for which there are no medications currently available. It may also be valuable for the development of safer pain medications.”

Unlike the other opioid receptor subtypes, the kappa opioid receptor (KOR) is not associated with the development of physical dependence or the abuse potential of opiate drugs (e.g., heroin, morphine). Therefore, medications that act at the KOR could have broad therapeutic potential for addressing addiction, pain, as well as other mental disorders. The leading compound in this context is JD_Tic because its specific binding to the KOR has been shown to reduce relapse to cocaine seeking in animal models.

In this new study, scientists produced a high resolution three-dimensional image of JD_Tic bound to the human KOR. By mapping all the points of contact between JD_Tic and the human KOR, researchers were able to see how the two fit together. The emerging picture reveals critical new information that helps explain why JD_Tic binds so tightly and specifically to this particular opioid receptor. This advance opens the door to the development of compounds targeting the KOR with improved therapeutic profiles, including that of non-addictive pain medications.



The structure of the kappa-opioid receptor with bound antagonist JD_Tic is shown resting in a poppy flower, the source of opium. Image by Yekaterina Kadyshvskaya, PSI:Biolog GPCR Network, The Scripps Research Institute.

The study by Wu et al., can be found at: www.nature.com. For information on prescription drug abuse, go to: www.drugabuse.gov/drugs-abuse/prescription-medications.

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The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug abuse and addiction. The Institute carries out a large variety of programs to inform policy and improve practice. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found on the NIDA home page at www.drugabuse.gov, which is now compatible with your smartphone, iPad or tablet. To order publications in English or Spanish, call NIDA's DrugPubs research dissemination center at 1-877-NIDA-NIH or 240-645-0228 (TDD) or fax or email requests to 240-645-0227 or drugpubs@nida.nih.gov. Online ordering is available at <http://drugpubs.drugabuse.gov>. NIDA's media guide can be found at <http://drugabuse.gov/mediaguide/>, and its new easy-to-read website can be found at www.easyread.drugabuse.gov.

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