

Listening 2

Kind: captions hows your neurochemistry? Hi everyone, its me your resident molecular neuroscientist here for DNews These days it seems that everyone is a chemist, and our own brains are our experimental medium. Caffeine, nicotine, and alcohol are our favorite legal reagents, and some states have added a new one: THC. Tetrahydrocannabinol, THC, is the psychoactive component of marijuana and the chemical responsible for the "high" people reportedly feel. With legalization on the minds of many, we thought we'd take a look at new data on the lasting effects of this drug on our brains. Now, I wanna say upfront that studies that attempt to examine functional and structural changes in human brains and attribute them to chronic drug exposure are extremely challenging because, its nearly impossible to control all the variables inherent in our everyday human lives. While mice and other model organisms share the same genetic sequence, live in the same type of cages, eat the same food, and share the same sleep schedule, it is IMPOSSIBLE to replicate these conditions in human studies. The next time you're looking at a news report on a human psychotropic drug study ask yourself "how many test subjects were these conclusions based on?" because small studies that contain only tens of participants, are more likely to contain high levels of variability that *could* influence the conclusions drawn. That said, a recent report from Northwestern University found what they call "exposure dependent morphometric abnormalities" but they really just mean "structural changes" in young, non-addicted marijuana users compared to non-users. This new study went beyond the usual brain region activation experiments to examine the volume, shape, and density of grey matter (a measure loosely associated with cell count) in a group of 40 college students in the boston area. As expected there was an increase in the volume and density of grey matter in the Nucleus Accumbens and Amygdala of marijuana users, but what was really interesting was a change in *shape* of the Nucleus Accumbens in the marijuana users. The Nucleus Accumbens is one of my favorite brain regions because it is an important connection in the set of neural pathways we call the "reward circuit". The pleasurable feelings you get when you see or experience something that makes you happy is because of activation in this important brain area. That all sounds good right? well, because it's responsible for helping you feel good, this nucleus is also a big factor in the development of addictions. In rodents, a portion of the nucleus accumbens has been shown to increase in size as dependence on addictive substance increases, and researchers in this human study expressed concern that the changes in shape, volume, and density they observed in the 20 marijuana users they looked at may be irreversible structural changes that prime the brain for addiction. marijuana use during the years of development (which, for humans, doesn't stop until the mid twenties) has been shown to correlate to lower IQ, impaired memory, and poor decision making. So when and if you decide to experiment with your brain chemistry, make sure you understand that it might not just be molecules that you are playing with. What do you think?? how dense is your Nucleus Accumbens? Subscribe to D News and let us know in the comments down below! You can also come find me on twitter at PolyCrystalHD