

Worksheet: limbic system

If there were one function that characterizes all of the limbic system, what would it be?

Some round worms synthesize morphine and express the receptors at which morphine acts; giving them the morphine antagonist naloxone causes behavioral excitation in these animals. Which do you think came first? Addictive agents, or brain systems for reinforcing behaviors?

One characteristic of the limbic system is that the limbic system appears capable of overriding (at least sometimes) conscious rational thought. We can't just "snap out of" depression; we have difficulty stopping intake of an addictive drug even if we want to. It's reasonable to expect that there are physical reasons underlying this fact. What do you think they could be?

A lesion to the hippocampus appears to have relatively little effect on procedural memory, but can have profound effects on declarative memory. Can you imagine a situation in which you are actively using both procedural and declarative memory at the same time?

Many of the components of the limbic system are found in deeper, older parts of the brain. Why might this be the case?

A person who has had damage to the prefrontal cortex experiences difficulty in changing behavioral strategies—they persevere with strategies that have worked in the past and are slow to adopt new ones. What are some situations in which this behavior might be bad? Are there situations in which this behavior might be beneficial? What would you expect to find in an fMRI study of the prefrontal cortex, in an experiment that simulated a trip to a casino?