

Love Changes The Brain

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The touch makes love proverbs and now ensures neuroscience shows it. The close coexistence and sexual contact increase the number of receptors in the brain for two neurotransmitters involved in establishing the couple bonding, oxytocin and vasopressin.



At least that is what happens in the meadow mice or voles, the animals chosen by scientists, by their tendency to monogamy source as a model to study the “thorny” subject of love and relationships. Apparently after mating develop a strong preference for their partner, with whom he formed lasting ties the rest of his life. The male also engages in the same mean that the female in the care of children. A great example for our species.

Up to now ignored the biological mechanism responsible for this behavior. Was attributed to genes, as some close relatives, mountain voles (*M. montanus*), few sociable and very promiscuous. And both parents soon ignores their young.

Now a group of researchers in the biomedical sciences department of Florida State University says that monogamy in the prairie vole has an epigenetic origin. That is, is due to changes in the genetic material induced by cohabitation and mating. These epigenetic modifications do not alter the DNA, but makes expressed differently, in this case to seal the joint and make it couple durable. And all these changes take place after mating.

The molecules of attachment and love

Apparently sex cohabitation and increase the number of receptors in the brain for females oxytocin and vasopressin in males, two evolutionarily ancient neuropeptides involved in bond formation and pair bonds, which act together dopamine, another neurotransmitter that triggers when we fell.

Specifically oxytocin, also known as hormone attachment in females promotes social contact, mate preferences and subsequent attachment. Produce sense of security and well-being and reduces stress. Although best known for increasing muscle contraction during labor, also has a role in sexual and reproductive behaviors and is released during orgasm occurs.

Vasopressin is the male version of hormone attachment. Besides promoting social contact, partner preference and attachment, favors males in territorial behavior over other potential rivals of the same sex, which in humans called jealousy. Also increases attraction and sexual and reproductive behaviors.

Both neuropeptides increases memory, attention and learning. Something that seems logical because after the “honeymoon” reach the young, of no deal and require a full part.

Drug induced fidelity

The funny thing is that researchers have achieved the same effect by a partner preference in females, injecting chemicals, no need to have been previously paired. However, the coexistence itself was a prerequisite. Administering them have succeeded trichostatin (TSA), a drug that causes changes in histone molecules which act as a reel spool, to compact the DNA into cells.

Trichostatin, belongs to a family of drugs used in psychiatry and neurology, inhibitors of histone dactilases (HDAC). These drugs, in particular trichostatin A, prevent DNA condensation and provides some genes are activated by addition of chemical groups to DNA acetyl.

The observed epigenetic changes that promote loyalty and histone involving precisely occurred in genes encoding receptors for the hormones oxytocin and vasopressin, involved in partner preference and social behavior in general.

In addition, the female voles that came TSA increased the number of oxytocin and vasopressin receptors in their brains in a very concrete, accumbens nucleus, a key structure in the brain's reward system, responsible for feelings of pleasure. Mohamed Kabbaj, author of the study, and his colleagues also found that drugs that block these receptors prevents the formation of pair bonds.

Since voles are important models for understanding the neurobiological mechanisms of establishing pair bonds in our species, the authors say their findings open the way to new therapeutic options in the disturbed social behavior, especially since there are already drugs HDAC clinical trials with promising results.

Perhaps in the not too distant future, “out of love” is as easy as taking a simple pill ...