

Want to cuddle? Personality is likely to get you further than oxytocin.

Why do people cuddle? According to a slew of media reports, that answer lies in oxytocin, dubbed either the “cuddle chemical” or the “love hormone.” English pharmacologist and neurophysiologist Sir Henry Hallett Dale was the first to isolate oxytocin from pituitary extract in 1921, eventually receiving the 1936 Nobel Prize in medicine and physiology for the discovery. Dale’s work on oxytocin was prompted by his interest in the ergot fungus, extracts of which had a long history of use for stimulating the contractions of the pregnant uterus. The question was why.

In 1909 Dale had prepared an extract from the posterior lobe of the pituitary and showed that it caused contractions of the uterus when injected into a pregnant cat. As a result, pituitary extract replaced ergot preparations as the prime method to induce labour. Dale hypothesized that the reason ergot stimulated contractions was because it contained some component that resembled a substance that women in labour produced naturally. But what was that component? Dale wasn’t successful in isolating the active ingredient from ergot, but eventually did manage to isolate oxytocin from pituitary glands, deriving the name of the newly discovered substance from the Greek for “quick birth.” Ergometrine, the active ingredient in ergot, was finally isolated and identified in 1935 by one of Dale’s former colleagues, Harold Ward Dudley.

The concept of hormones as chemical messengers had been introduced in the first decade of the twentieth century by British researchers Bayliss and Starling who had found that entry of food into the small intestine caused the mucosa to release a chemical that then traveled through the bloodstream to the pancreas where it stimulated the release of pancreatic juices and bile needed for digestion. “Secretin” became the first hormone to be isolated, the term “hormone” deriving from the Greek “to excite.” This was the first demonstration that chemical action could be transmitted to remote parts of an organism without involvement of the nervous system. The search was now on for other such messengers.

The tiny pea-sized pituitary gland in the brain was a candidate for the production of chemical messengers because autopsies had revealed that people who grew to be “giants” had enlarged pituitaries. It seemed possible that the enlarged gland was sending some sort of message to the rest of the body signaling it to grow. In 1912, Henry Cushing would postulate the existence of a “hormone of growth” produced by the pituitary. He turned out to be correct. But even before this, as we saw, Henry Dale had been working on pituitary extracts, finally isolating oxytocin in 1921. The compound’s exact chemical structure, a string of nine amino acids, commonly referred to as a “polypeptide,” was not determined until 1953. That same year oxytocin became the first polypeptide hormone to be synthesized in the laboratory and the synthetic version quickly replaced pituitary extract as the drug of choice.

Today, synthetic oxytocin is widely used to induce labour, too widely according to some. The concern has nothing to do with the fact that a synthetic version is used, oxytocin is oxytocin whether made in the lab or in the body. Rather the issue is over the amount that is administered, which does not exactly mimic natural production, and in some cases can cause contractions that are too severe. Perhaps more importantly, it is becoming clear that oxytocin affects behaviour in various ways and can conceivably produce effects in exposed babies down the road.

The behavioral connection first emerged from an investigation of the love life of the prairie vole. These mammals are unusual in that they are monogamous. What makes them so? It seems their love is rooted in the release of oxytocin. When a couple engages in sex for the first time, oxytocin is released, somehow formalizing the union. From then on, the voles only have eyes for each other. Blocking the release of oxytocin with an oxytocin antagonist, which basically is a modified form of oxytocin, results in one night stands. Should prairie voles be injected with oxytocin, they will search for a partner, and even if they are prevented from having sex, will continue to stay with the chosen partner.

On the other hand, a close relative, the “montane vole,” is immune to the effects of oxytocin, apparently having no receptors for the chemical. Other mammals do have receptors, even though they may not be monogamous. Sheep, for example, reject their young if treated with oxytocin antagonists, and female rats injected with oxytocin will nurture another’s pups as if they were their own. In rats, injection of oxytocin into the cerebrospinal fluid causes spontaneous erections, and there is some evidence that the hormone also plays a role in the female’s willingness to

bend to the male's desires. Some marketers of oxytocin highlight this effect and insinuate, without any evidence, that the chemical might have such uplifting effects in humans as well.

Humans obviously do have receptors for oxytocin, otherwise the chemical would have no biological activity. Aside from uterine contractions, the chemical appears to play a role in stimulating bonding between mother and child. Studies have also shown that humans who sniff oxytocin via a nasal spray become more trusting. In one interesting study, volunteers treated with oxytocin invested more money in a questionable business venture than those treated with a placebo even when they were told that there was no guarantee that the trustee was trustworthy.

Other studies have linked exposure to oxytocin with reduced social anxiety, but there have also been some disturbing observations with existing biases being strengthened when oxytocin was inhaled. Because of publicity given to preliminary data about improved social connections, it comes as no surprise that oxytocin nasal spray is being promoted on the web as a treatment for autism. There is some evidence of minor benefits, but long term risks are unknown. As far as cuddling or falling in love, or some sort of aphrodisiac effect, unfortunately there's no evidence. Experiments with human couples sniffing oxytocin have not shown any increased tendency to fall in love or even to cuddle. Better to rely on personality than a nasal spray.