

Oxytocin

The social hormone

It's been dubbed the "love" or "trust" hormone, because one of the key roles that the hormone oxytocin (ok-see-TOE-sin) is thought to play is to influence social function, particularly facilitating bonding, trust and attachment.

This may sound straightforward, but it isn't. Rather, oxytocin is part of an entire system involving not only this hormone but also the brain, hormone receptors and interaction with other hormones as well as your genetics.

Recent research using a nasal spray that delivers oxytocin to the brain is beginning to unravel the complexity of oxytocin's function and its possible use as a therapy for a number of conditions. However, the way this hormone works is far from certain, and any sort of use as therapy is experimental at best.

Social role

Oxytocin acts as a hormone throughout your body and as a neurotransmitter that influences brain activity and function. Facilitating childbirth is one way oxytocin acts as a hormone in the body. In fact, women with slowly progressing labor are often given the drug form of oxytocin — called Pitocin — to get a slow childbirth on a faster track.

In the brain, oxytocin appears to play a role in facilitating social activity throughout life, such as:

■ *Pair bonding and trust* — Oxytocin facilitates bonds between males and females and in mother and offspring — and it's particularly active in species that favor monogamous pairings. In addition, it facilitates empathy and leads to a calming, positive bias when assessing social cues of others.

In experimental economic games, people receiving an oxytocin nasal spray tend to be more willing to give money to an appointed trustee. However, some research suggests the effect is negated when the money goes to-

ward a project, rather than a person, or when the game facilitator is deemed untrustworthy.

■ *Interpretation of social cues* — The often-rapid visual gathering of information that occurs in social settings appears to be facilitated — and perhaps enhanced — by oxytocin. This allows people to quickly assess facial expressions, look for recognizable signs, and make friend- or foe-type judgments. Although oxytocin often appears to bias people toward viewing others in a more relaxed, positive light, it may be balanced by another brain-stimulating chemical called vasopressin, which may be more likely to cause suspicion and to trigger social anxiety or aggression.

■ *Calming of social anxiety* — Oxytocin also plays a role in the ways you respond to fear or stress — such as with a racing heart or bowel distress — by promoting a calming, anti-anxiety effect. In one study, people given oxytocin before a public speech exhibited lower signs of stress, especially if they had a supportive friend in attendance. There's also a link between low or imbalanced oxytocin levels in conditions such as depression, anxiety, and psychiatric disorders such as autism or schizophrenia.

Complicated recipe

Oxytocin is part of a suite of brain chemicals that coordinate social function. Others include vasopressin, cortisol and natural opiates. Estrogen and testosterone also influence the effect of oxytocin. In research involving live-action brain imaging, an oxytocin nasal spray led to different brain activity in men than in women.

The amount of oxytocin in your body is only part of its potential to have an effect. Oxytocin also must attach to receptors throughout your body. Receptor density and location appear to vary from person to person. Genetic makeup may influence the scope of oxytocin receptors in your body. Even life experience may alter genetics related to oxytocin receptor density and location.

Context also appears to be important when considering the effect of oxytocin. In one review of research, it was found that while some studies showed oxytocin to have a pro-social effect, other studies showed no effect in that regard. In addition, about 21 percent of studies showed oxytocin to have an antisocial effect, such as increasing feelings of envy, mistrust or insecurity.

It's not known why oxytocin may have pro- and antisocial effects. It's possible that oxytocin's ability to increase attention to social cues may be beneficial in more-familiar situations, with people perceived as more trustworthy. On the other hand, it may have a less social effect in a setting of competition, unfamiliarity or uncertainty.

Treatment role uncertain

It's too early — and there are far too many unknowns — for oxytocin to be used as treatment in anything other than an experimental setting.

Still, early research has shown some promise in using it to treat symptoms of several conditions, including post-traumatic stress disorder, a certain form of dementia that leads to lost social skills, and a borderline personality in which people are extra sensitive to perceived social threats. Theoretical uses for oxytocin treatment include depression, anxiety disorders, psychiatric disorders, irritable bowel syndrome and in couples counseling.

Short of using oxytocin as a treatment, positive social interaction appears to stimulate the oxytocin system. Hugs and support of loved ones may be a way to leverage the stress and anti-anxiety role of oxytocin. Even pets may have an effect. One study found that urinary oxytocin levels were higher in people who made more eye contact with beloved pet dogs than it was in people who made less eye contact with pet dogs that they didn't feel attached to.

Perhaps this effect accounts in part for why healthy social relationships are important contributors to overall health and well-being. □