Oxytocin Peptide

Oxytocin is a small peptide comprising only nine amino acids, produced in the hypothalamus and secreted by the posterior pituitary. It has also been isolated from placenta, ovaries, testes, adrenal glands, thymus, retina, and pancreas. The active hormone is obtained by proteolytic cleavage of a larger precursor protein. It is no longer considered merely a neurohypophyseal hormone as its effects are considered to be far-reaching and include interaction with additional peptides. Oxytocin appears to be a protein with two independent natural functions. First, it appears to act as a neuropeptide produced by the hypothalamus to regulate bonding, reproduction, and birth. Oxytocin appears to be not only bloodborne but also secreted by the placenta of pregnant animals to influence birth, milk production, and bonding with their young. Small amounts of the protein produced from testes appears to promote mating behavior and pair bonding.

Specifications

**OTHER KNOWN TITLES:** Endopituitrina, Pitocin

**MOLECULAR FORMULA:** C43H66N12O12S2

**MOLECULAR WEIGHT:** 1007.2 g/mol

**SEQUENCE:** Cys-Tyr-lle-Gln-Asn-Cys-Pro-Leu-Gly

Oxytocin Research

**OXYTOCIN AND WOUND HEALING**
Oxytocin appears to regulate inflammation through inflammatory cytokines. Increased social interaction in one research model was observed to trigger Oxytocin (Pitocin) level, which researchers speculated may heave lead to faster tissue repair and wound healing. Similarly, studies in hostile equations between animals appears to suppress oxytocin production and delays wound healing, potentially by up to 40%.[1] The researchers conclude that *“These data confirm and extend prior evidence implicating oxytocin and vasopressin in couples’ positive and negative communication behaviors, and also provide further evidence of their role in an important [variable].”* These hostile couples also exhibited reduced IL-6, tumor necrosis factor-alpha, and IL-1beta at the wound site.[2]

**OXYTOCIN AND CARDIOVASCULAR RISK**
The hormone has been speculated to protect cardiac and vascular systems. It may act to dissipate and burn off fat cell accumulation, influence blood pressure and glucose intolerance, and potentially block or mitigate secretion of stress hormones.[3] These factors may influence cardiovascular disease (CVD), and thus Oxytocin (Pitocin) may be an potential agent in the study of CVD. Reduced Oxytocin receptors may cause atherosclerosis.[4] The scientist report that *“The major pathophysiological basis of CAD is atherosclerosis in association with varieties of immunometabolic disorders that can suppress oxytocin (OT) receptor (OTR) signaling in the cardiovascular system (CVS).”* Oxytocin exposure appears to overcome the drawback of reduced receptor density and helps maintain cardiac integrity. Exposure of peptide in hearts of rats during a heart attack appeared to assist in preventing cellular death of cardiomyocytes. Jankoski et. al. suggested that late-term development of dilated cardiomyopathy may be addressed by chronic Oxytocin (Endopituitrina) treatment. It also appears to help to prime the cardiac stem cells for “*tissue regeneration through direct differentiation, secretion of protective and cardiomyogenic factors, and/or their fusion with injured cardiomyocytes*.” It further appears to mitigate cases of cardiac damage due to diabetes in mice. The fat accumulation in these mice was reported to be reduced by 19%, and the fasting glucose levels by about 23%. Oxytocin (Endopituitrina) appears to increase insulin resistance in the animals, possibly establishing proper systolic and diastolic functions over control animals leading to decreased cardiomyocyte hypertrophy, fibrosis, and apoptosis.[5] It appears to protect against ischemic injuries in other tissues as well apart from the heart. Rats with priapism indicate the potential action of Oxycotin (Pitocin) against ischemia-reperfusion injury by reducing nitric oxide levels.

**OXYTOCIN AND DIABETES**
The peptide appears to improve glucose uptake by skeletal muscles via boosting insulin sensitivity. It further may enhance lipid utilization, dyslipidemia, and body fat mass reduction. Oxytocin deficiency has also been suggested to correlate to body mass, irrespective of external factors, suggesting its role in energy homeostasis.[6] Oxytocin appears to affect insulin, glucose, and body composition in obese mice but not in lean mice. Research observations suggest that the peptide might be impactful only in very certain conditions. The backdrop of diabetes appears to trigger different effects on diabetes models compared to controls.As per Barengolts, “*circulating oxytocin is lower in type 2 diabetes versus normoglycemic subjects and negatively correlated with glycosylated hemoglobin A1C and insulin resistance.*“

**OXYTOCIN AND COGNITIVE PERFORMANCE**
Maternal deprivation may cause irreversible cognitive and behavioral functioning changes. Mice models suggest Oxytocin changes due to less parental bonding may be a prominent cause. Oxytocin exposure in maternally deprived mice appeared to increase hormone levels for neuronal development in the prefrontal cortex. Overall behavior appeared to remain constant, but the cognitive ability was observe to be improved in the cohort exposed to Oxytocin.[7] Intranasal Oxytocin may improve learning in mice in the backdrop of stress.

**OXYTOCIN PEPTIDE RESEARCH AND ANXIETY**
The hormone has been studied for its potential to minimize anxiety and depression. The genetic polymorphisms in the Oxytocin (Endopituitrina) receptor gene appear to cause social anxiety disorder and problems with attachment in childhood. Animals exhibiting chronic anxious behavior have also displayed epigenetic changes in the Oxytocin receptor.[8] This indicates a possible compensatory pathway for pathologically suppressed Oxytocin levels. This indicates that social anxiety may be partially triggered by diminished Oxytocin signaling. Oxytocin dysregulation may lead to borderline personality disorder (BPD) as well. BPD is extremely challenging and has significant short- and long-term impacts; therefore, Oxytocin may help understand the pathology leading to better treatment.

**OXYTOCIN AND HUNGER**
Research in a condition (Prader-Willi syndrome) marked by uncontrolled appetite has suggested that at least part of the pathology may result from increased suppression of Oxytocin (Pitocin) signaling.[9] Therefore, Oxytocin (Endopituitrina) has been suggested to play a potential role in regulating hunger state and feeding behavior.

**OXYTOCIN AND OLD MUSCLE**
Oxytocin also appears to regulate muscle maintenance. Age-associated reduction in molecule levels appears to lead to muscle wasting (sarcopenia). The research carried out at Berkeley suggests that both blood levels of the peptide and its receptors on muscle stem cells decrease over time. Exogenous use of Oxytocin appears to allow muscles to recover much of their healing potential. According to Elabd, one of the authors of the research, *“repair of muscle in the old mice was at about 80%”* compared to younger mice after Oxytocin was presented. Thus it can be potentially studied in relation to organ degeneration further, it may possibly slow down dysfunction.

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