

## THE RELATIONSHIP BETWEEN OXYTOCIN AND SOCIAL COMPETENCE IN DOGS

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**Background:** Family dogs (*Canis familiaris*) are increasingly recognised as translational models of human social behaviour. The current project focuses on determining to what extent the oxytocin system regulates such human-like behaviours in dogs.

**Aims:** In two relating studies we first aimed to confirm the effect of social interaction on dogs' peripheral (plasma) oxytocin. Then we aimed to test how increased oxytocin levels influence behaviour.

**Method:** A conceptual replication of canine serum oxytocin increase following positive dog-human interaction was carried out on  $N = 6$  dogs. In an independent study dogs ( $N = 33$ ) were treated with either oxytocin or placebo nasal spray and exposed to a contagious yawning situation.

**Results:** Positive social interaction (petting, playing, talking) was found to increase serum oxytocin levels ( $t_{(5)} = 4.846, p = 0.005$ ). It was found that oxytocin pre-treatment significantly decreased the number of yawns, especially during the test phase (pre-treatment  $\times$  phase:  $F_{(1,121)} = 4.499, p = 0.036$ ; pre-treatment main effect:  $F_{(1,121)} = 4.459, p = 0.037$ ). In addition the number of yawns was strongly related to the number of mouth licks, especially during the post phase (mouth licks  $\times$  phase:  $F_{(1,121)} = 8.234, p = 0.005$ ; mouth licks main effects:  $F_{(1,121)} = 14.100, p < 0.001$ ; Fig. 2).

**Conclusions:** We have validated and described both an immunoassay method to measure oxytocin as well as a social interaction that reliably increases oxytocin levels. Testing for the effect of intranasal oxytocin on an empathy-related measure (contagious yawning) we have found, that contrary to expectations oxytocin decreased the number of yawns in dogs. This suggests that contagious yawning is not a valid measure of empathy in dogs, as our results indicate that a stress behaviour (mouth licking) is strongly related.

**Keywords:** Dog, Oxytocin, Social behaviour

### Publications:

Hritcu, L. D., Horhoge, C., Ciobica, A., Spataru, M. C., Spataru, C., & Kis, A. (2019). Conceptual Replication of Canine Serum Oxytocin Increase Following a Positive Dog-human Interaction. *REVISTA DE CHIMIE*, 70(5), 1579-1581.

Kis, A., Tóth, K., Kanizsár, O., & Topál, J. (2019). The effect of oxytocin on yawning by dogs (*Canis familiaris*) exposed to human yawns. *Applied Animal Behaviour Science*, 104916.

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