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Sommario/riassunto

Our brain is endowed with an incredible capacity to be social, to trust, to cooperate, to be altruistic, to feel empathy and love. Nevertheless, the biological underpinnings of such behaviors remain partially hardwired. Seminal research in rodents has provided important insights on the identification of specific genes in modulating social behaviors, in particular, the arginine vasopressin receptor and the oxytocin receptor genes. These genes are involved in regulating a wide range of social behaviors, mother-infant interactions, social recognition, aggression and socio-sexual behavior. Remarkably, we now know that these genes contribute to social behavior in a broad range of species from voles to humans. Indeed, advances in human non-invasive neuroimaging techniques and genetics have enabled scientists to begin to elucidate the neurobiological basis of the complexity of human social behaviors using "pharmacological fMRI" and "imaging genetics". Over the past few years, there has been a strong interest focused on the role of oxytocin in modulating human social behaviors with translational relevance for understanding neuropsychiatric disorders, such as autism, schizophrenia and depression, in which deficits in social perception and social recognition are key phenotypes. The convergence of this interdisciplinary research is beginning to reveal the complex nature of oxytocin’s actions. For instance, the way that oxytocin does influence social functioning is highly related to individual differences in social experiences, but also to the inter-individual variability in the receptor

distribution of this molecule in the brain. Remarkably, despite the increasing evidence that oxytocin has a key role in regulating human social behavior, we still lack of knowledge on the core mechanisms of action of this molecule. Understanding its fundamental actions is a crucial need in order to target optimal therapeutic strategies for human social disorders. The originality of this Research Topic stands on its translational focus on bridging the gap between fundamental knowledge acquired from oxytocin research in voles and monkeys and recent clinical investigations in humans. For instance, what are the key animal findings that can import further knowledge on the mechanisms of actions of this molecule in humans? What are the key experiences that can be performed in the animal model in order to answer significant science gaps in the treatment of neuropsychiatric disorders? Hence, within this Research Topic, we will review the current state of the field, identify where the gaps in knowledge are, and propose directions for future research. This issue will begin with a comparative review that examines the role of this peptide in diverse animal models, which highlights the adaptive value of oxytocin's function across multiple species. Then, a series of reviews will examine the role of oxytocin in voles, primates, and humans with an eye toward revealing commonalities in the underlying brain circuits mediating oxytocin's effects on social behavior. Next, there will be a translational review highlighting the evidence for oxytocin's role in clinical applications in psychopathology. Hence, via the continuum of basic to translational research areas, we will try to address the important gaps in our understanding of the neurobiological routes of social cognition and the mechanisms of action of the neuropeptides that guide our behaviors and decisions.