



# Effect of Melatonin on Telocytes in the Seminal Vesicle of the Soay Ram: An Immunohistochemical, Ultrastructural and Morphometrical Study

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## Abstract:

Telocytes (TCs) are a special type of interstitial cell with characteristic cellular processes that are described in many organs. The current study aimed to investigate TCs in seminal vesicles of the Soay ram responding to melatonin treatment during the nonbreeding season by conventional immunohistochemical stains, and to detect the ultrastructural and morphometrical changes of TCs. TCs in the control group showed a broad range of staining affinity and also reacted positively to CD117/c-kit, CD34, desmin, S-100 protein, and progesterone and estrogen receptors alpha, while after melatonin treatment a strong reaction against these 6 antibodies was recorded. Electron microscopically, TCs in the control group were characterized by a small cell body with distinct long cytoplasmic extensions called telopodes (Tps). Tps had alternation of the thin segment (podomers) and dilated segments (podoms), in which the latter accommodate mitochondria, rough endoplasmic reticulum and caveolae. TCs and their Tps were interconnected by homo- and heterocellular junctions and form a wide network to communicate between different cell types. Tps showed close contact with immune cells, progenitor stem cells, smooth muscle cells and other interstitial cells. Melatonin caused a significant increase in the number of TCs, length of Tps, and number and diameter of secretory vesicles. Also, the melatonin-treated group showed exaggerated secretory activity in the form of a massive release of secretory vesicles from Tps. Moreover, Tps showed an increase in their contact with blood and lymphatic capillaries, nerve endings and Schwann cells. In addition, the shedding of secretory structures (exosomes, ectosomes, and multivesicular bodies) was greater from Tps, which were involved in paracrine signaling in the melatonin-treated group. The length and ramifications of Tps together with the intercellular junctions and the releasing of shed vesicles or exosomes assumed an essential role of TCs in intercellular signaling and coordination. On the basis of their distribution and morphology, we investigated whether the different locations of TCs could be associated with different roles.

## Keywords:

Telopodes · Interstitial cells · Stem cells · Shed vesicles · Exosomes · Electron microscopy

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