

ULTRASTRUCTURAL FEATURES OF MAST CELL DEATH IN AUTOTRANSPLANTED LYMPH HEART OF ADULT FROG *RANA TEMPORARIA*

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Lymph hearts of the frog are hollow, pulsating organs, 1–2 mm in diameter, allowing the lymph to be pumped into the venous system. In this work, lymph hearts of the frog were used as an experimental model for studying the processes of initiation and development of sterile inflammation in damaged tissues and necrosis-like death of mast cells (MCs). The ultrastructure of damaged and dying MCs in the striated muscle tissue of posterior lymph heart of adult frog were studied in conditions of temporary ischemia (hypoxia) caused by autotransplantation of this organ into its own bed. It was found that damaged MCs die by oncotic necrosis pathway during the time interval from 3 days to 6 weeks after autotransplantation of the lymph hearts. The early stages of frog MC oncosis are characterized by swelling of cytoplasmic membrane organelles (except cytoplasmic secretory granules), dilatation of the perinuclear space, budding of ribosome-coated vesicles from the outer nuclear membrane, and greater chromatin condensation in the nucleus of some MCs. Later stages of oncotic necrosis are characterized by disintegration of the plasma membrane, release of cytoplasmic secretory granules, largely intact morphologically, into the extracellular space, and karyolysis. The presence of presumably nuclear material is found in the extended perinuclear space of some damaged and dying MCs. The release of bubbles of the rough endoplasmic reticulum into the extracellular space of still undestroyed MCs in places of local disintegration of the plasma membrane was noted. Immunocytochemical labeling of MCs at the ultrastructural level using antibodies against histamine, substance P (SP) and atrial natriuretic peptide (ANP) revealed the localization of gold particles both on secretory granules located in the cytoplasm of damaged and dying cells and on the granules that released into the extracellular space after disintegration of the MCs. The data obtained in this study suggest that MCs dying by oncotic necrosis may be involved in the initiation and development of an sterile inflammatory process in autotransplanted lymph hearts of the frog and produce alarmins promoting the development of inflammation.

Keywords: autotransplantation, lymph heart, mast cell, oncotic necrosis, sterile inflammation, homeostasis of secretory granules, immunolocalization of histamine, atrial natriuretic peptide and substance P, frog