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The Using of Electron Microscopy in the Diagnosis of Amphibian Pathologies

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Abstract

Studying of amphibian tissues and cells by modern microscopy methods can reconstruct functional background of organs and systems patholody.

Keywords: electron microscopy, amphibian, histopathology, cells, tissues.

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Studying amphibian histopathology includes various methods: histological, histochemical, autoradiographic, immunohistochemical, electron microscopic and in situ hybridization. Traditional electron microscopy makes it possible to evaluate morphological changes in cells and tissues. At the same time, using immunocytochemistry and 3D reconstruction of cells and organelles opens new possibilities for assessing functional changes in the animal's organism.

Transmission (TEM) and scanning (SEM) electron microscopy methods are used as important diagnostic tools for screening tissue pathologies and additional combination with other techniques is possible: light microscopy, immunohistochemistry and so on. Electron microscopy allows various objects pathologies studying: tumors, pathology of the kidneys, neuropathology (skin, muscles and nerves), skin diseases, cytology (fine needle point, bronchial and peritoneal washings, urine, and pleural exudate) testes, etc.

Electron microscopy plays an important role in the diagnosis of viral infections. Obtaining information about size and morphology of viral particles leads to rapid identification of infectious agents. Digital reconstruction of the three-dimensional structure of viruses makes it possible to show in detail the ultrastructure of viral particles, including characteristic diagnostic features, such as surface filaments of parapoxvirus C-particles and internal strands of the nucleoprotein of the Newcastle disease virus.

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One of the major threats is the pollution of the environment by nanoparticles of metals and their compounds. Such particles can aggregate in cells, causing the deposition of insoluble granules or dissolve in the hyaloplasm and cause a direct toxic effect on organisms. Electron microscopy allows to reveal and localize metal nanoparticles, to show the mechanisms of their penetration into tissues and the disturbances caused by them.

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