DEPARTMENT FOR ELECTRON MICROSCOPY
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1. HISTORY

The Electron microscopic Laboratory, Institute for Pathology, Military Medical Academy (MMA), was founded in 1972 by a Colonel Prof. Dr. Petar Spasić, Ph.D. The first microscope LEM 4C Iskra type was granted to the Laboratory by the Institute for Medical-Technical Protection, while five years later the first TEM 201C Philips type was delivered to MMA. In 1981, a TEM Philips 400 T equipped with S(T)EM and EDAX was purchased. In 1997, 25 years after the foundation of the Laboratory, the Department for Electron Microscopy received a TEM Philips 208 capable of computer morphometric image processing (Figure 1). The head of the Department at that time was Prof. Andelija Škarо Milić, Ph.D. From the year 2005, the Department has been managing by the Assistant Professor Goran Brajušković, Ph.D. The major professional activity of the Department for Electronic Microscopy has been the practical implementation of microscopy in pathology. This department has analyzed more than 10 000 biopsies so far. Each analyzed biopsy implies the preparation of several micrographs stored in our files. The application of electronic microscopy for scientific and research purposes is under way together with our professional activities. Except for standard processing of biopsy material for electronic microscopy and negative smearing of samples of cell suspensions for microorganisms analysis, our laboratory also performs EM-immunocytochemical analysis (immuno-gold EM by the use of colloidal particles of gold). Ultrastructural investigations have been the object of dozens of defended dissertations and theses. Since its foundation, the Department for Electron microscopy has been training center for countless experts from medical centers of Serbia, including the whole former Yugoslavia. This laboratory also cooperates with all related laboratories which use electronic microscopy. The laboratory personnel have always been included in projects of scientific investigations of various biomedical issues in a rather multudisciplinary fashion.
2. INVESTIGATIONS

Balcanic nephropathy

To this Department, virus etiology of endemic nephropathy (Balcanic) has been, and still is, over a long period of time, one of the major research objects. Renal biopsies evaluations within Serbia and Bosnia and Herzegovina have disclosed the presence of viruses, confirming, so, viral etiology of this nephropathy. Corona viruses have been detected in cell cultures of urogenital tumor tissue in patients with endemic nephropathy. The results of these investigations have been cited in the world’s relevant textbooks of nephrologic pathology.

Ultrastructural pathology of malign tumors

Ultrastructural pathology of malign tumors of various etiologies has been the long-range study of this Department. Particular attention has been paid to ultrastructural pathologic changes of tumor cell nucleus and to analyzing of Ag-NOR. Except for human tumors, the subjects of our investigations have also been ultrastructural characteristics of test animals’ tumors, as well as the characteristics of immortile cells in tumor cell cultures.

Programmed cell death

Apoptosis has been the major object of investigation activities in the Department over the past 15 years. At the level of ultrastructural research, also investigated were morphologic characteristic of cell dying through the process of spontaneous and/or induced apoptosis of neoplastically transformed cells (Figure 2). Our investigations revealed that, contrary to the long-standing opinion about intactility of organelles, mitochondria suffer ultrastructural changes during this process. Programmed cell death of isolated thymocytes of experimental animals has also been the object of investigations.

The others investigation

Over almost 35 years of this Laboratory existence, research has been ranking highly with countless investigations ending successfully. On this occasion I am mentioning only few of them. In this Department, investigated have been also ultrastructural characteristics of glomerulonephritis, hepatocytes infected by hepatitis B and hepatitis C, as well as some rare skin and muscles diseases. We have published numerous case
reports refering tumor pathology. Phospho creatine effects in a cardioplegic solution and ultrastructural characteristics of trombocytes during various protocols of cryopreservation have also been investigated, as well as ultrastructural heart and v.safen characteristics. Reactive arthritis etiology was the subject of a just finished multidisciplinary study including electronmicroscopic analysis.

3. REFERENCES