DO PATHOLOGISTS USE THE **ELECTRON MICROSCOPE ENOUGH?**

Stephen W. Carmichael, Mayo Clinic

The compound light microscope has been used by pathologists for centuries, and remains the common tool for making a diagnosis. A half century ago, the electron microscope (EM) was introduced, and has also been proven to be a valuable, but expensive, tool. In the meantime, other tools and methods have worked their way into the pathologists' armamentarium, with immunohistochemical, genetic, and molecular techniques being the most obvious examples. Josep Lloreta-Trull, Lola Ferrer, Teresa Ribalta, Marco Pavesi, and Sergio Serrano examined the literature to determine the frequency and appropriateness with which pathologists use the EM in their studies.

Whereas EM is a basic tool in morphologic research, throughput limitations and/or budgetary constraints limit its routine use in pathologic diagnosis. Lloreta-Trull et al. were concerned that these restrictions have been limiting the optimal use of the EM in the practice of pathology. They examined all of the articles in three leading pathology journals over a five-year period. This amounted to 2,531 articles! Studies were classified by subject and divided into three main categories: case reports, descriptive articles, or new diagnostic strategies. Of these, 17.6% (448) used EM and were the subject of the study. Both the actual and potential EM content were scored as follows: 0, none; 1, illustrative; 2, supportive; 3, confirmative (gold standard); 4, extensive; and 5, predominant. Using this scale, 77% were deemed to contain relevant ultrastructural information. The selected articles dealt mostly with soft tissue tumors, followed by genitourinary and nervous system diseases. Analysis showed that EM support was lacking most often in articles on serosal neoplasms and on new diagnostic strategies (e.g., novel combinations of antibodies), followed by muscle diseases, head and neck tumors, and gynecologic pathology. It was suggested that the remaining 23% could benefit from including EM as an ancillary, control or gold standard method to complement, support, or confirm the results. Lioreta-Trull et al. also looked at trends toward increasing or decreasing the use of EM over the five-year period, and no definite trends were found in either direction.

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Lloreta-Trull et al. demonstrated that authors include ultrastructural data relatively often in their reports, which may come as a surprise to many pathologists. However, a small but nonnegligible percentage of pathology articles could benefit from including EM as an ancillary, control, or gold standard method to complement, support, or confirm their results. Of course, the tools that pathologists use for a published study may not reflect tools used in everyday practice, but the conclusions of this retrospective study of the literature is nevertheless informative. It was pointed out that an EM in every hospital is not justified, but academic institutions that teach students and residents and are involved in basic research should be equipped with an EM facility. This facility, in turn, could support diagnostic activity from that institution, and from referring hospitals.

- The author gratefully acknowledges Dr. Josep Lloreta-Trull for reviewing this article.
- Lloreta-Trull, J., L. Ferrer, T. Ribalta, M. Pavesi, and S. Serrano, electron microscopy in pathology articles: A retrospective appraisal, Ultrastructural Path. 24:105-108, 2000.
- American Journal of Surgical Pathology, Human Pathology, and Modern Pathology

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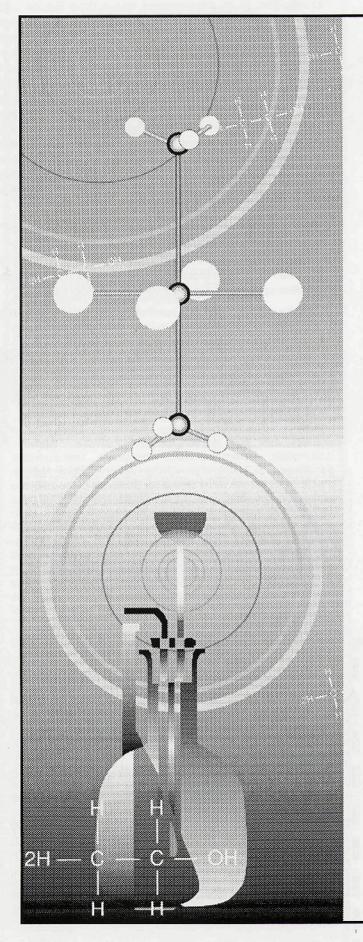
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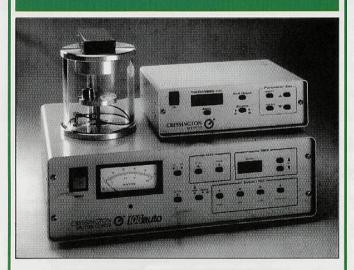
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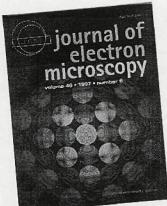
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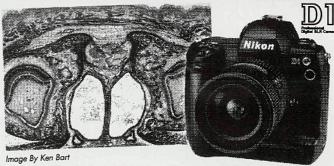
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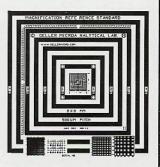


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