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PATHOLOGY

IN PRACTICE



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The histopathology cut-up room has changed little over time. However, with extended roles for biomedical scientists in this original laboratory specialty now at the pilot site stage, Surgipath Europe's Azeem Hanif looks at a new digital system that will support both scientist and science

Image is everything as MacroPATH arrives in the cut-up room

Currently, progress is being made to extend roles in biomedical science, and cut-up room protocols in histopathology are of particular interest in this respect. Innovative digital imaging technology can be of great assistance in meeting the challenges presented by these extended roles and, in more general terms, can greatly assist in the preparation of reports and also save a considerable amount of time.

Histopathology is a very visual science and, while diagnosis can be influenced by an assortment of data, it is ultimately based on the gross and microscopical appearances of biopsy material and excised gross specimens. Presently, a significant part of a routine histopathology report is dedicated to the macroscopical description of the specimen and the documentation of those appearances that substantiate a histological diagnosis. Much of a report's accuracy depends on the vocabulary used and the descriptive expertise of the pathologist or biomedical scientist. In addition, there is a requirement to document and record the location on the specimen from which each tissue sample is taken.

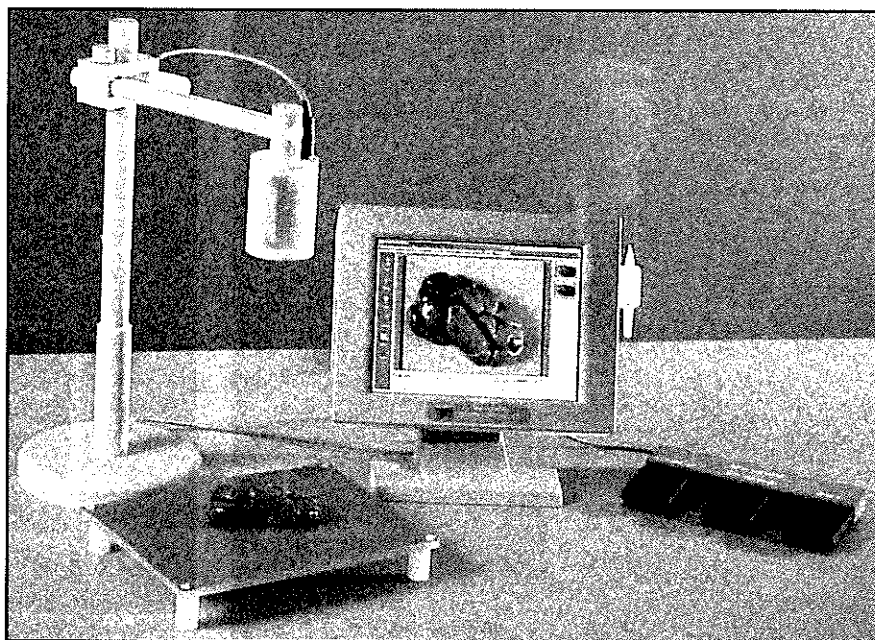
In the interests of clarity and in recognition of the wide variation in descriptive skills, reports on complex specimens are occasionally supplemented with photographs of the gross specimen. The notation of this data occupies a considerable amount of the time required to produce a histopathology report. Furthermore, filing hard copies of photographs becomes a problem as the database expands.

Digital imaging arrives in cut-up

MacroPATH – a new digital imaging system – has been designed specifically for use in the cut-up room to help eliminate the vagaries of the purely descriptive report and, crucially, to save time during the cut-up process. The system allows the immediate capture and storage of digital images of gross specimens and provides the means to indicate the location of sample excision and a convenient method of on-screen specimen measurement. The system also stores macroscopic images of all specimens examined and provides an indispensable diagnostic database for

teaching, research and quality assurance.

Currently, specimen measurement can be a messy and time-consuming process, as can marking sites of excision with dyes, while diagrams of specimens with block keys can be crude and difficult to interpret. MacroPATH makes these crucial steps easier and clearer, and the user-friendly software means that computer knowledge is not essential. As the system is designed for use in a 'wet' area, a waterproof and dustproof keyboard and mouse are available, and it uses a space-saving all-in-one controller with an integrated 15-inch touch screen housed in a translucent splash-proof enclosure.



▲ MacroPATH digital imaging system

MacroPATH in use

To start the process, a patient identifier code is entered via keyboard or barcode and subsequent image capture, measurement, annotation and sample site identification are inserted using the touch-screen technology, foot pedal controls or the mouse. Images are captured within two seconds and a thumbnail sequence of all images saved is generated to facilitate subsequent image manipulation.

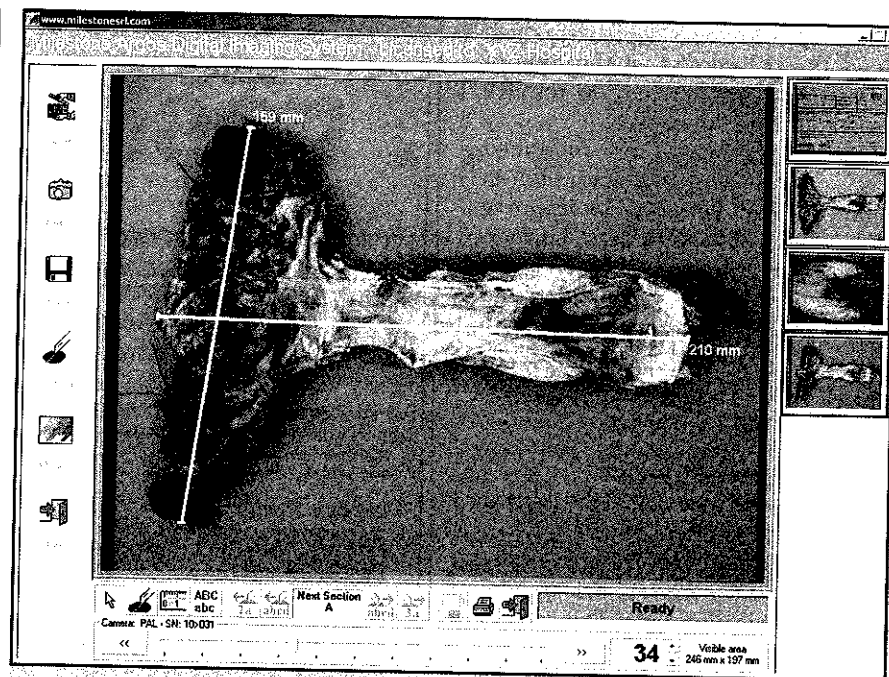
The system uses an enclosed industrial video camera with optical zoom (x14), which can be installed either at the cut-up workbench or on a photographic stand. Therefore, the operator can examine the whole specimen or zoom in to the smallest detail.

Digital cameras are already in use in some cut-up rooms to capture images but MacroPATH uses a video camera (a frame grabber card transforms the camera signal into digital images) in preference to a digital camera because as yet the latter does not provide optical zoom – for digital cameras to achieve optical zoom above x5 a digital zoom is required, which implies a lower definition. In addition, digital cameras are less suitable for low-light conditions and specimen sizing is not possible with them because software (and therefore calibrated) control of the zoom position is as yet unavailable.

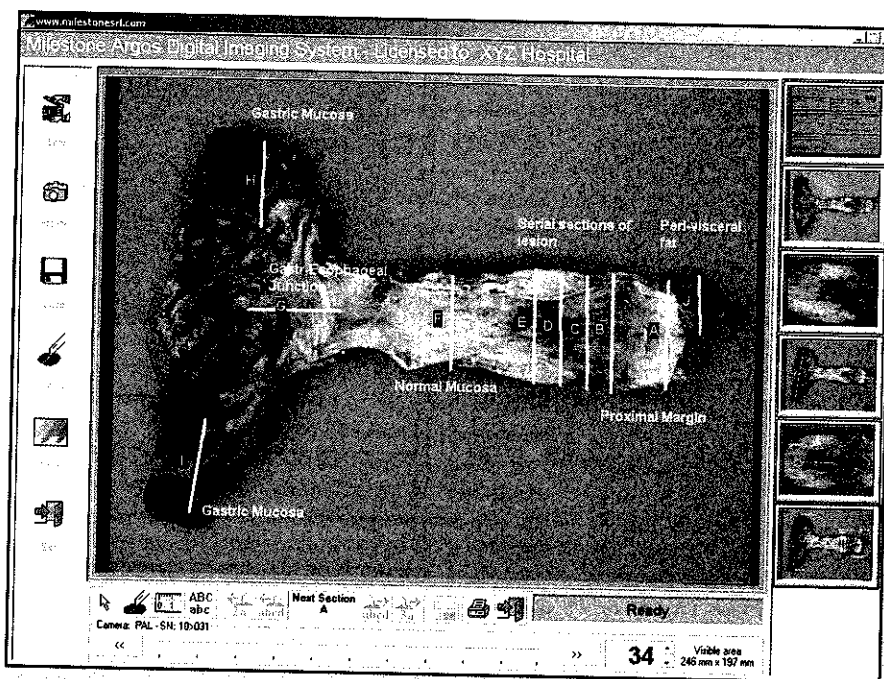
Captured digital images can be saved in a variety of formats (jpeg, tiff or bmp) and thus can be opened with a range of software and easily attached for email transmission. When stored on a central data server, any PC connected to the intranet can download the images.

With MacroPATH, images of the gross specimen are available to the pathologist at the time of microscopical examination, as too are the fully embedded annotations and measurements, which can then be included in the final pathology report. Furthermore, PathVision dedicated image

continued overleaf



▲ Specimen dimensions can be taken and integrated into the image



▲ Annotations and a representative block key can be incorporated into the image

Relaunch of an enhanced website offering information to life science and medical research professionals

Integra Biosciences, an international supplier of innovative laboratory equipment and supplies for cell cultivation, liquid handling and sterilisation applications, has recently announced the launch of its redesigned and expanded website.

Located at www.integra-biosciences.com the site uses a design format that is rapidly downloaded by web search engines and provides visitors with direct multilingual access to a major source of valuable information and news.

Intuitively structured, the site provides easy and rapid access

to a comprehensive and expanding applications database, scientific reports, bibliography and the latest news on technological and product developments.

Further information on the company and its products, together with hints and tips to get the best out of Integra Biosciences' equipment is also given.

Integra has for many years supplied and supported customers around the world with equipment, supplies and solutions to many applications in life science and medical research.

processing software is available, which allows the pathologist, at the time of microscopical examination, to retrieve and manipulate the images.

MacroPATH images are identified by a unique file name and built-in enhancers can be used to improve colour, brightness and contrast. Furthermore, new measurements can be taken, new lines and annotations added and the images can be printed. PathVision represents a powerful software tool that complements the cut-up room features of MacroPATH.

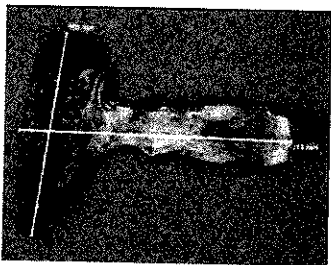

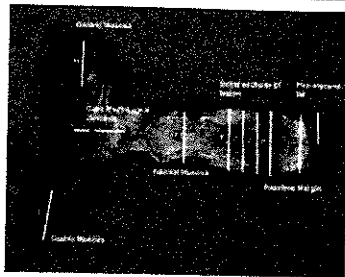
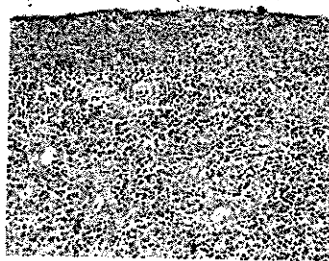
Advanced role support

Introduction of MacroPATH is particularly timely. Currently, the role of biomedical scientists is being extended in cut-up, and work on suitable training programmes is underway. This exciting opportunity is intended to unlock a pathologist's time and to add value to the role of the biomedical scientist. MacroPATH can be used to complement this process.

In addition, MacroPATH's comprehensive database can facilitate the teaching and supervision required for this extended role and allows biomedical scientists to build up a portfolio of case histories. It will also provide peace of mind for all concerned as images can be retrieved easily for retrospective manipulation and examination.

All in all, MacroPATH represents a versatile new tool in an environment that has changed little over many years. Also, a version of MacroPATH for the mortuary will be available shortly, increasing the number of potential applications, especially in training. **[PIP]**

MacroPATH and PathVision have been developed in Italy by Milestone. Further information is available from Surgipath Europe on 01733 333100 or by email at sales@surgipatheurope.com

SAMPLE		Ref. No.	Sex	Page	
XZY HOSPITAL			M F	1 of 1	
		Patient Name			Date
		XXXXXX YYYYY			
		Requesting Clinician/Surgeon			Received Date
		ABC			
		Reported: Date	Time		
HISTOPATHOLOGY LAB		Clinical Data			
		Segment of large colon			
DIAGNOSTIC REPORT					
<p>CLINICAL NOTES: Esophageal neoplasia resected after radiation and anti-blastic therapy.</p> <p>MACROSCOPIC DESCRIPTION: Segment of fresh esophagus with attached segment of stomach, measurements and Block Key as indicated in Fig. 1, 2 and 3.</p>					
GROSS IMAGING					
					
Figure 1: Specimen Dimensions					
					
Figure 2: Area of Lesion					
					
Figure 3: Representative block key					
<p>MICROSCOPIC APPEARANCE Segment of esophagus with a large area of mucosal ulceration. The base of the ulcer is made up of granulation tissue with intense lympho-plasmocytic infiltration and scattered foreign body giant cells. Gastric mucosa shows moderate inflammatory infiltration in the lamina propria. No signs of residual tumor are present, neither in the esophageal wall nor in the rare perivascular lymph nodes</p>					
					
Figure 4. H&E showing ulcerated area with extensive granulation tissue at the base with intense inflammatory with infiltration of lymphocytes and plasma cells.					
<p>DIAGNOSIS: Segment of esophagus without signs of neoplastic involvement. Mucosal ulcer of esophageal mucosa with granulation tissue and lympho-plasmocytic infiltration at its base. Sections of gastric wall with moderate inflammatory infiltration in the lamina propria (negative for Helicobacter Pylori). Perivascular lymph nodes (2) with mild hyperplasia, without metastases.</p>					
DIAGNOSIS:					

▲ Images can be incorporated easily into final reports

Joint effort to accelerate the development of antibiotics

Tepnel Life Sciences has entered into a collaborative agreement with Professor John McCarthy, professor of chemical biology at UMIST (University of Manchester Institute of Science and Technology). The objective of the collaboration is the development of special ribosome-based antimicrobial screening technologies. These are intended to enable pharmaceutical and biotechnology companies to identify compounds that have antimicrobial properties, thus accelerating the discovery of new antibiotics.

Tepnel, which will own all intellectual property resulting from the collaborative screening technology development, plans to offer this technology to customers in the biopharmaceutical industry as part of its growing portfolio of analytical services aimed at the drug discovery and development process.

Professor John McCarthy is a leading figure within the field of

post-transcriptional gene expression, the biological process on which the new antimicrobial screening technology will be based.

Ben Matzilevich, chief executive officer of Tepnel Life Sciences comments: "We are delighted to enter into collaboration with such a renowned and respected scientist. John brings with him a wealth of experience and knowledge in post-transcriptional research, which complements our own expertise with RNA analysis and the development of marketable products and services from these technologies."

Professor John McCarthy comments: "In the course of this collaboration, we hope to pursue new strategies that will help us understand how to target key processes in pathogenic organisms. This greater understanding, combined with Tepnel's product development, commercial and marketing capabilities, will lead to improved products that will accelerate the drug discovery process."