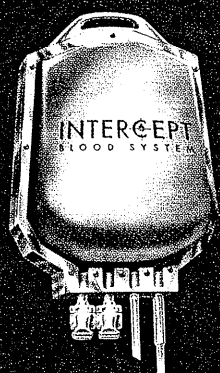
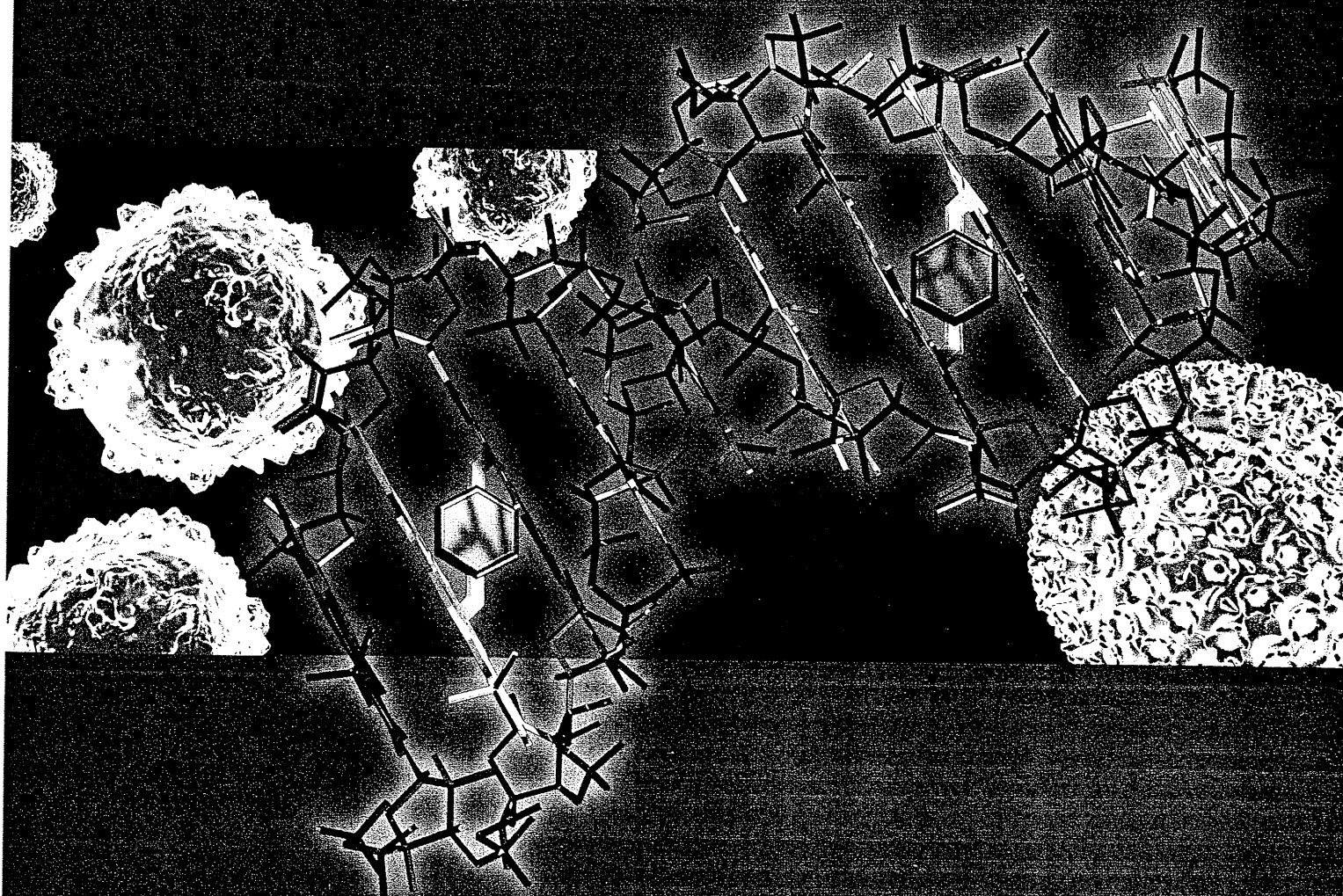


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PATHOLOGY

IN PRACTICE



**THE PATHOGEN
INACTIVATION SYSTEM
FOR PLATELETS**

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Surgipath Europe product manager Sue Bennett has encountered some scepticism about the application of microwave technology in histopathology. But, she says, all it takes to melt away any misgivings is to see the RHS-1 process and then compare the results with conventionally prepared specimens.

Fast but not furious

Increasingly, histopathology and cytology as disciplines that comprise cellular pathology are slowly moving away from each other. There are many reasons for this, which will vary depending on to whom you speak, but one of the fundamental reasons is the difference in methods of preparation of material and the potential turnaround time needed to obtain a diagnosis.

There are governmental and global objectives that aim to improve procedures throughout the healthcare system and these focus on three areas: decreased turnaround time, reduced cost, and a move towards environmentally friendly processes. Inevitably, these will affect working practices within the NHS.

Histopathology has long been a discipline steeped in traditional procedures that have changed little with the passage of time. This has led to resistance to encompass new technology in some areas, resulting in other pathology disciplines being allocated a greater proportion of the overall pathology budget and a trust expectation that histopathology will not feature highly when funding is allocated. How often has the histopathology laboratory struggled to replace a water bath when another discipline has just taken delivery of a very costly piece of automated equipment?

The RHS-1 microwave processor from Surgipath Europe fulfils all three of the objectives referred to above, while remaining a long-term, cost-effective option for histopathology. It was designed in Italy by Milestone, a company that has been actively involved in advanced microwave technology since 1988. More than 25 international patents are incorporated into Milestone equipment, which has a global reputation for both knowledge and support of its customers.

Microwave technology has been available in the domestic setting for many years but its use in histopath-

ology has been limited by the lack of control of certain parameters such as temperature and uneven distribution of microwaves. However, Milestone's knowledge in this field has now resulted in the control of these parameters.

Decreased turnaround times

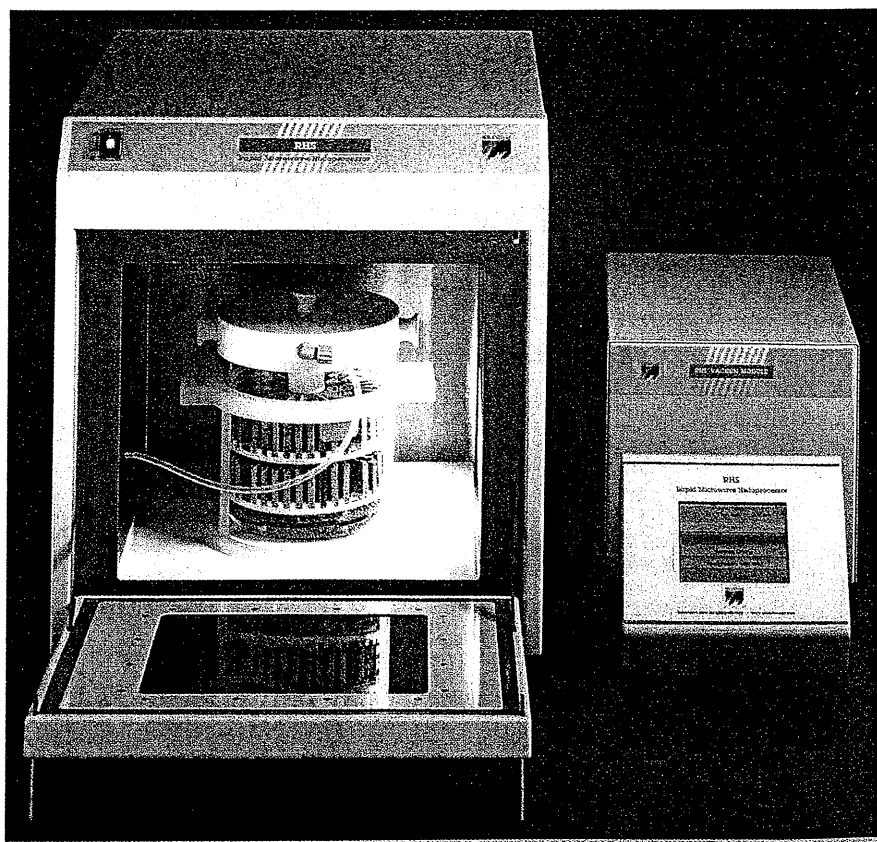
The RHS-1 fulfils the first objective by reducing times for needle and small biopsies to as little as 30 minutes – ideal for one-stop clinic work – and normal tissue blocks (4 mm thick) to between 120 and 180 minutes. RHS-1 achieves this by combining microwave irradiation with precise computer control of

power, time, temperature and vacuum.

When used with JFC – Milestone's special one-step dehydrating and clearing reagent – minimum processing times can be achieved and fatty tissue can be processed well, without the need to compromise on cell morphology or staining quality.

Reduced bottlenecks

Reduction in processing times also can be invaluable in moving the heavy workload experienced, particularly during the morning, and the bottlenecks of throughput associated with this. Staff members are an increasingly



▲ Small footprint, high standards: Surgipath's RHS-1 microwave processing machine that does so much more.

* valuable resource – often difficult to come by – and many laboratories suffer from shortages as a result of day-release training courses or sickness that can deplete staff availability.

Using the RHS-1 means that the laboratory can move the workload to times when staff are available to handle it and when pathologists are there to report it, removing the pressure to get slides to the pathologist ever earlier. Faster turnaround times also mean that length of stay in hospital can be reduced – a major health service objective in its own right!

No need for xylene

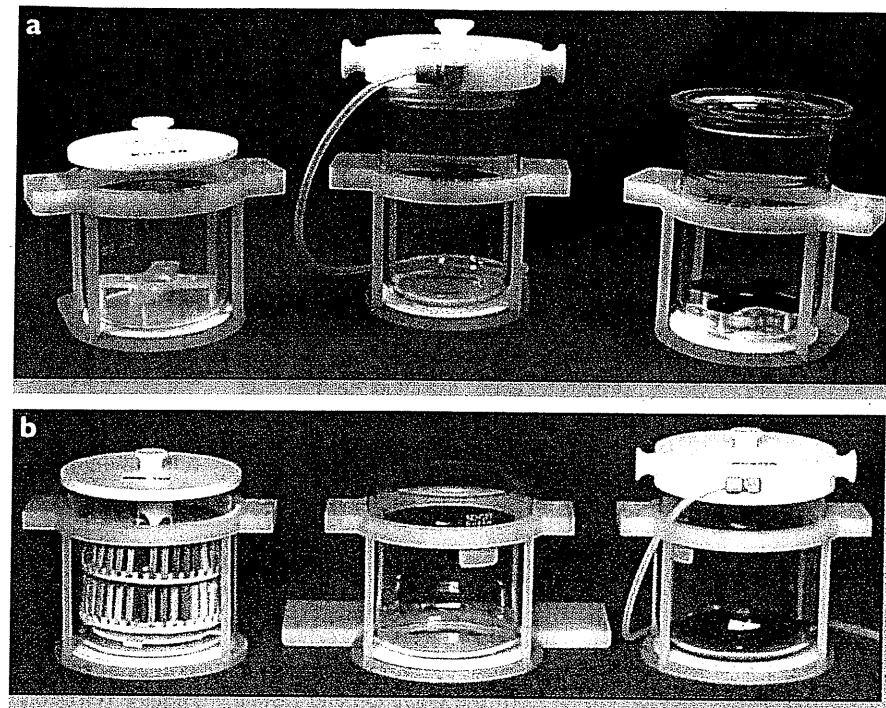
Use of the RHS-1 represents a major change from conventional processing and eliminates the need for hazardous reagents such as xylene – traditionally used to 'clear' tissues. This fulfils the third objective.

Using Milestone's JFC solution to dehydrate tissues in the RHS-1 results in superior lipid extraction during this phase of the process, enabling fatty tissue to be processed in a minimal amount of time. Furthermore, if FineFIX – a formalin-free fixative – is incorporated in the processing protocol, not only can formaldehyde be removed from the laboratory environment but also routine tissue samples can be used as a source from which to extract DNA and RNA for molecular biology techniques. This prevents the need for storage of fresh frozen tissue, the whole of which has to be sacrificed once thawed.

Different sizes of module are available to cater for the many and varied needs of individual laboratories, from four cassettes to a maximum of 110 cassettes per run. This allows flexibility to process small numbers of urgent biopsies in an online situation if needed. However, it is not necessary to separate different sizes of tissue if the requirement for maximum speed is unclear. As a rule of thumb, tissue is processed for the time appropriate to the thickest piece included in the run, which provides unmatched processing times of three hours (compared to 12–14 hour overnight schedules on a conventional tissue processor).

Less reagent and wax

Dispensing with the need for a clearing agent and reducing the amount of dehydrating fluid has clear cost implications – both in terms of purchase and disposal – and fulfils the second objective. Further significant savings can be made because the wax employed in the impregnation stage remains uncontaminated and does not require changing. The only wax used is that which replaces the water in the tissue – topping



▲ Different sizes of module are available to cater for the many and varied needs of individual laboratories: a) histomodule kit for 30 cassettes, b) histomodule kit for 110 cassettes.

up the wax container is all that is required. On average, cost savings of up to 50% on reagents used for processing can be achieved easily.

Simple software

In addition to its performance advantages, the RHS-1 is very user friendly. It employs Windows CE industrial-grade touch-screen controls with coloured display. All time, temperature and vacuum parameters are controlled by the sophisticated software, as is magnetic stirring. No external controls or dials tempt the user to 'fiddle', either by intention or mistake.

Language options are available for the global market, and a graphic display of the set parameters appears on the screen during use. These parameters are also available for archiving and retrieval for TQM and GLP systems, and can be printed by attaching a printer to the port at the back of the touch-screen terminal.

The programmes – there are 200 preloaded – can be password protected, modified or personalised easily if required, and can be stored in the memory. The touch screen and programming have been designed to steer the user clearly through each stage with ease and understanding.

Fast and multifunctional

The RHS-1 is also multifunctional and among its pre-stored protocols are those for decalcification, epitope retrieval, fixation and special staining.

Decalcification has long been a

bottleneck in the histology laboratory and interest in cases often is lost by the time the associated bones have been processed. With the RHS-1, however, decalcification times can be reduced by a factor of 30, resulting in much faster turnaround times for cases.

Epitope retrieval can be performed at 98°C or, using a high-temperature glass reactor, at 120°C. All parameters are computer controlled and all fluid levels remain constant, permitting solution pH to remain unchanged throughout the procedures, giving optimal and reproducible results.

Fixation can be carried out without the production of artefacts due to the precise control afforded by the computer-driven software. This can also be applied to large organ fixation – so important in some post-mortem cases where organs need to be returned to the cadaver quickly – prior to cut-up.

Special staining in a dedicated module can be performed quickly, with no risk of splashing or artefact due to inconsistent temperature.

Small footprint

Designed with a small footprint to maximise the use of limited laboratory space, the RHS-1 is manufactured to the highest industrial standards – domestic microwaves are designed 'for domestic use only', outside which warranties and liabilities may be invalidated. In short, this is a one-step machine that can help biomedical scientists comply with the directives of the future in the histopathology laboratory of today. **[PIP]**