Improving Sectioning Quality and Throughput with Thermo Scientific HM 355S, Section Transfer System and Cool-Cut

Peterborough City Hospital

The pathology department at Peterborough City Hospital provides a vital service in processing patient specimens for cancer diagnostics and treatment. A key element of the workflow is sectioning of processed tissue in preparation for staining.

Their choice of automated microtome? The Thermo Scientific™ HM 355S™ rotary microtome paired with the Thermo Scientific™ Section Transfer System™ (STS) and Thermo Scientific™ Cool-Cut™.

Profile

Peterborough City Hospital opened in 2010 and is part of the Peterborough & Stamford Hospitals NHS Foundation Trust. Serving a catchment area including Peterborough, Cambridgeshire, Leicestershire and South Lincolnshire it covers a population of around 500,000 people. Their focus is to give patients the right care, first time, every time.

The Cellular Pathology Department is run by Operations Manager Alice Jim-Huttly. In the past year, they have dealt with almost 25,000 cases, including breast, skin, prostate, and colon. These cases have equated to around 57,000 blocks, 128,000 slides, and an average of 500 cancer diagnoses made every month. Renal biopsies and lymphoma cases are the only cases not dealt with as they are sent away for specialist pathology reporting. The statistics are ever-increasing in line with pathology departments throughout the UK as a result of an ageing population, better cancer detection, and improved treatments. This puts increasing pressure on Alice and her team to optimise throughput and utilise lean workflow. The department consists of twelve full-time staff, one part-time and one locum, at grades ranging from band two and three Assistant Technical Officers (ATO's) through to band eight Senior Biomedical Scientists. They operate a very efficient laboratory with an excellent team.

Thermo Scientific HM 355S
Thermo Scientific Section Transfer System
Thermo Scientific Cool-Cut

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A core part of the workflow is the requirement for high-quality sectioning of important patient specimens, ready for staining. In addition to their older manual microtomes they now use the Thermo Scientific HM 355S microtome with Section Transfer System and Cool-Cut. After trialling the key microtomes on the market, the HM 355S and STS performed favourably and Peterborough purchased the complete package. Alice commented, “I liked the HM 355S itself – it was nice to use. I like the fact that it is very solid.”

HM 355S Microtome, Section Transfer System, and Cool-Cut

The HM 355S microtome is a fully automated rotary microtome providing high levels of safety, consistency, reliability, and ease-of-use. Featuring four cutting modes and enabling sectioning thickness from 0.5µm to 100µm, it includes a menu-driven control panel which can be seated on either side of the microtome. The user-selected cutting window maximises throughput, while the optional foot pedal gives ease of use with minimal user fatigue. A “double-tap” start and emergency stop provide the optimum in user safety.

The Section Transfer System is an accessory for the Thermo Fisher Scientific HM series of microtomes. It helps to reduce manual handling by automatically transferring section ribbons from the blade to the water bath. Adjustable laminar water flow minimises tissue section damage, allowing more usable sections per block. A specially designed disposable blade holder supports the transfer ramp, and sections are stretched in the smooth water flow, providing high quality and consistency of sections. The water bath has user-selectable temperature from ambient up to 50 °C, while the integrated lighting offers excellent section visibility. The positioning of the water bath in front of the microtome also helps to free up vital space on the bench – important in busy, modern laboratories where space is at a premium.

The Cool-Cut further complements the HM 355S and STS by maintaining a cool, consistent temperature of the paraffin block during sectioning. Designed with an efficient peltier cooling system, it enables even difficult specimens to be sectioned easily and also allows serial sectioning for faster throughput.

Tricia Ward is one of the Biomedical Scientists at Peterborough and is the main user of the HM 355S, STS, and Cool-Cut. After returning to work following shoulder surgery, it was clear that she would be unable to perform manual

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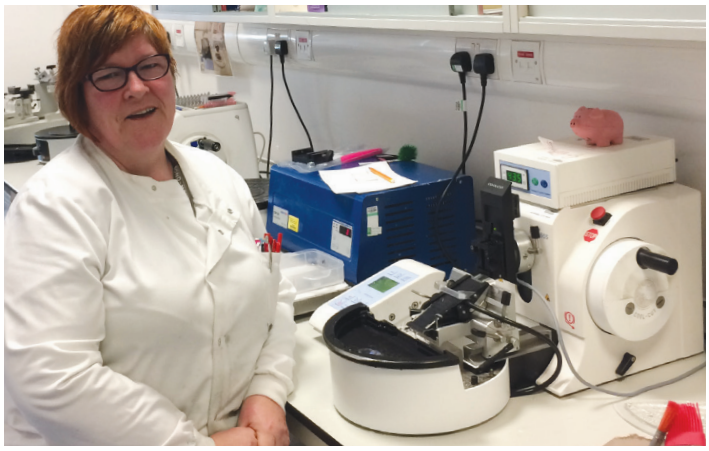
Tricia Ward, Biomedical Scientist

sectioning. Having the HM 355S and STS meant that Tricia could continue working. Tricia commented, “The quality is a lot better, and it has kept me in a job! It will also help people with repetitive strain injuries.”



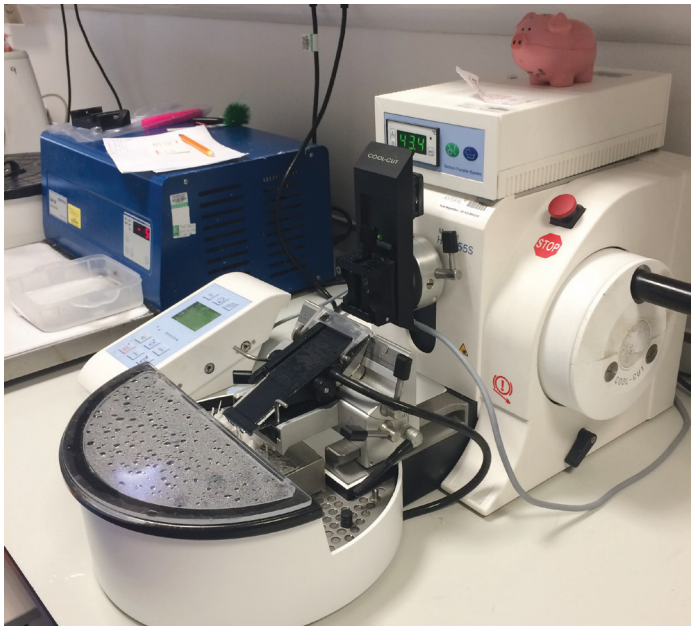
Tricia Ward, Biomedical Scientist, Peterborough City Hospital

The Choice for Difficult Specimens

For the more challenging specimens, the HM 355S and STS have become regarded as the “go-to” microtome in the Peterborough laboratory. Tricia commented, “It is definitely better on difficult specimens. When anybody has a block that they can’t get a section from, they give it to me. They know that if this machine can’t do it, then no microtome will be able to do it.” Tricia also finds that the Section Transfer System helps with specimens such as decalcified bone. If the specimens haven’t been fully decalcified, sectioning can be very problematic and the other microtomes are often unable to section them. She again commented, “If the specimen isn’t completely decalcified they will give it to me. I think that the waterfall helps to keep the section in one piece.” Tricia also told us how the STS is good for sectioning of haemorrhagic specimens. “Because the specimen is wet, it keeps the dust down. On a manual microtome where the specimens are dry, the blood goes everywhere!”

Cleaning & Maintenance

To keep the Section Transfer System running smoothly, Tricia operates a regular cleaning regime. After the day’s sectioning, she washes all of the components in hot, soapy water. Every Friday she also pumps the soap solution through the pipes to ensure they are thoroughly clean. She finds that this strict regime keeps the instrument working correctly, with minimal downtime. Referring warmly to the HM 355S, Tricia commented, “His name is Dougal, because I love the Magic Roundabout!”



“Dougal”

Workflow Efficiency

Workflow efficiency has been improved at Peterborough with the HM355S, STS, and Cool-Cut. Being able to quickly trim in multiple blocks before sectioning is a great benefit, and the Cool-Cut ensures that the blocks are cold and the wax stays hard. Additionally, Tricia found that when trimming in initially, being able to send down a test section really helps the process. “As the ribbon comes down the water stream you can ensure that you have the full face of the block.” While the sectioning rate in Peterborough is 30 points per hour, Tricia typically sections two hundred points per day – one of the

fastest in the laboratory. In this instance, a point is classed as a standard block for Haematoxylin & Eosin, whereas more complex specimens such as prostates require four blocks per case and will count as five points. She also only ever has a very small percentage of re-cuts required. Tricia commented, “I don’t think there is anything that I can’t section on that machine!”

Summary

The HM 355S with Section Transfer System and Cool-Cut have certainly proved their worth in the laboratory at Peterborough. In addition to the high throughput, they give consistency and high quality while importantly enabling Biomedical Scientist Tricia to continue working after shoulder surgery. Consequently they have just purchased an additional system for the laboratory as part of an upgrade program with Thermo Fisher Scientific which also includes a tissue processor and embedding centres. Tricia concludes, “There is nothing I can’t section on it! It is idiot-proof!”

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Tricia Ward, Biomedical Scientist

Find out more at **thermofisher.com/pathology**

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