

Your tissue's journey towards diagnosis

The role of the pathologist and what happens behind the scenes



STEP 1 Sample collection

After your biopsy appointment, a tissue sample is collected, which is then preserved in formalin, labelled with your info and sent to the pathology institute.

STEP 2 Registration and macroscopic examination

Your sample is entered into a digital system, known as the Laboratory Information System (LIS). It then gets assigned a barcode for safe and easy tracking at every step. The pathologist examines your tissue sample and selects bits to be examined under the microscope. That selected tissue is then encased into a small plastic container known as a cassette.

STEP 3 Processing tissue

During processing, water is removed from the tissue and replaced with paraffin. This can take several hours, depending on the size of your sample, so it is typically left to dehydrate overnight.

STEP 4 Tissue embedding

Your tissue sample is then embedded in paraffin, forming a sturdy, solid block.

STEP 5 Microtomy

The paraffin-embedded tissue is sliced into 2–4 μm sections using a microtome. These thin, delicate ribbons require skill to handle and depend on proper calibration. After cutting, the ribbon is placed in a water bath and mounted on a glass slide.

STEP 6 Staining and coverslipping

Now that your sample has made it onto the glass, it's nearly invisible. It therefore needs to be dyed before a pathologist can examine it. Slides are first stained with Hematoxylin and Eosin (H&E). Next, the slide is covered with a layer of glass for preservation of the stained sample. Alternatively, the pathologist may need more of your tissue. To refine the diagnosis, the pathologist may order IHC, in-situ or molecular techniques for an even more detailed diagnosis. If cancer is present, the pathologist can diagnose what kind of cancer it is through IHC staining.

STEP 7 Diagnosis

A pathologist diagnoses your stained glass slide under the microscope by looking for signs of cancer or other abnormalities. At this stage, the oncologist, pathologist, surgeon and radiologist may opt for a complex molecular investigation as a prerequisite for personalised cancer therapy. The meeting where this discussion takes place is called a tumour conference. Sometimes, molecular pathology is required for more detailed analysis.

STEP 8 Molecular pathology

DNA or RNA is extracted for genetic testing to recognise mutations or pathogens. From those insights, an individualised treatment plan can be made to offer the best care.

Did you know?

A pathologist is a medical doctor who specialises in diagnosing diseases by examining tissues, fluids and cells taken from the patient. Pathologists play a crucial role in healthcare.

