

SPOTLIGHT ON PATHOLOGY

Pathology is the study of disease, its causes and its effects. It underpins every aspect of patient care, from diagnostic testing to treatment advice.

Pathology is a varied field and there are many different types of pathologist, for example:

- A haematologist may look at your blood if it does not clot properly
- A histopathologist may analyse a tissue sample for cancerous cells
- A forensic pathologist may examine a body for the cause of death
- If you have an infection a microbiologist will advise whether you need antibiotics

Pathologists also play an important role in a range of research, from investigating the effects of new drugs in clinical trials, to devising new treatments to fight viruses, infections and diseases like cancer.

In this way, pathology can be considered the bridge between science and medicine. It supports almost every aspect of healthcare.

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SPOTLIGHT ON HISTOPATHOLOGY

A Histopathologist is a type of pathologist who specialises in examining patient tissues and cells under a microscope.

Histopathologists play a vital role in the diagnosis and management of cancer, amongst other diseases.

Charlotte (pictured) is a trainee histopathologist here at NPIC, her day is varied, and she is involved in a mix of activities:

- Charlotte will look at specimens that have been sent in by surgeons and GPs. She will decide which areas to look at in more detail under the microscope.
- These areas of tissue are then processed in the laboratory by biomedical scientists and turned into glass slides. When Charlotte looks at these slides, she searches for abnormalities.
- Charlotte will then share this information with other doctors by preparing and sending out a report.
- When patients are diagnosed with cancer, she will attend team meetings with the surgeons, specialist nurses and other staff to help decide which other investigations or treatments are needed.

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SPOTLIGHT ON STAINING

Staining helps the pathologist identify different types of cells and tissues. It provides important information about the shape, pattern, and structure of cells. It is used to help diagnose diseases, such as cancer.

When a tissue sample is taken from a patient it is cut into incredibly thin slices called sections. These are thin enough to be examined under a microscope. However, most cells are colourless and therefore must be stained in some way to make the cells visible.

Haematoxylin and Eosin (H&E) is the most common type of staining. It contains the two dyes, Haematoxylin and Eosin. This stains particular chemical groupings or molecules in different colours. Eosin stains pink and Haematoxylin a purpleish blue. The amount of staining, the staining pattern and the location of staining all provide information for the diagnosing pathologist.

After assessing the initial H&E stained slides, the pathologist may decide to order further, more specific stains that can provide more detailed information about the type of disease present, its severity, and what treatments might help that patient.

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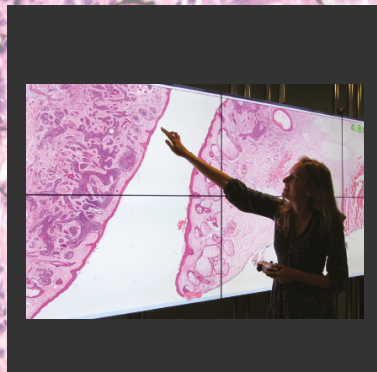
SPOTLIGHT ON DIGITAL PATHOLOGY

For hundreds of years the way that we diagnose diseases has remained unchanged. Today, advances in technology mean that microscopes can be replaced with digital pathology.

In digital pathology, glass slides of patient tissue are prepared in the lab, but the slides are then scanned using a high-quality microscope lens in a scanning machine. A digital image of the slide is captured and can be transmitted to a pathologist. The pathologist views the slide on a high-quality computer screen and can use specialist software to quickly zoom in and out on this high-resolution image to make a diagnosis.

Digital Pathology allows pathologists to transfer and share digital slides with colleagues quickly and safely, decreasing the possibility of slides being broken or damaged in transportation. It has improved sharing of images between specialists at different hospitals, and there is a faster transfer time between the laboratory and the pathologists.

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SPOTLIGHT ON THE NATIONAL PATHOLOGY IMAGING CO-OPERATIVE

The National Pathology Imaging Co-operative (NPIC) will deploy digital pathology to the NHS.

NPIC is one of 5 UKRI Centres of Excellence in digital imaging and AI based in Leeds. Leeds has been at the forefront of digital pathology research and innovation for over 15 years, with Leeds Teaching Hospitals being one of the world's first fully digital pathology labs.

NPIC builds on this success and revolutionises the way tissue diagnostic services are delivered and the development of AI.

Over the next two years NPIC will deliver and install digital slide scanners in 3 NHS improvement networks, encompassing over 15 NHS sites, and serving 6 million people across Yorkshire and the North East of England. We will support the digitalisation of 2 further national networks, specialising in paediatric tumour and bone and soft tissue pathology services.

National Pathology Imaging Co-operative, NPIC (Project no. 104687) is supported by a £50m investment from the Data to Early Diagnosis and Precision Medicine strand of the government's Industrial Strategy Challenge Fund, managed and delivered by UK Research and Innovation (UKRI).

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