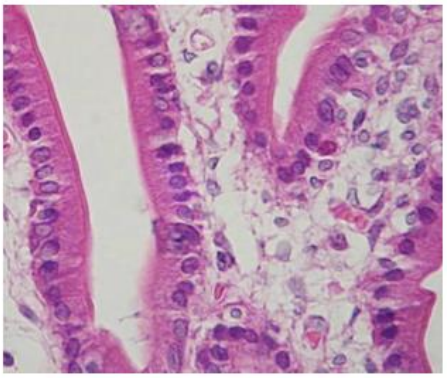
Haematoxylin and Eosin

Return

H&E stained section from the duodenum



Eosin is an acidic dye - it is **negatively** charged. It stains basic structures pink or red. As most cytoplasmic structures are basic, it stains pink.

Haematoxylin is a basic dye – it is **positively** charged. It stains acidic structures a purple-blue.

Given this information, what do you think haematoxylin primarily stains?

Show labels

why is the cytoplasm basic?

-Most proteins in the cytoplasm are positively charged due to arginine and lysine amino acids residues; eosin in negatively charged so it binds to these positively charged residues, staining the protein pink

- DNA is acidic, and therefore haematoxylin strongly stains the nucleus; aditionally RNA in ribosomes and rough endoplasmic reticulum stains strongly with haematoxylin

Role of the Cellular Pathologist

- The stained tissue sections are sent to the cellular pathologist, who interprets the appearance of the cells and tissue
- The tumour is graded – an assessment of how far the tumour tissue deviates from normal, non-cancerous tissue
- Colorectal cancers are broadly described as well-differentiated, moderately differentiated, and poorly differentiated

CANCER GRADE: how different are the cancer cells from the healthy ones near the origins; a lower grade indicates a slower-growing cancer and a higher grade indicates a faster-growing ones

CANCER GRADE: staging is a way of describing the size of a cancer and how far it has grown; when identifying cancer, doctors carry out tests to check how big the cancer is and whether it has spread into surrounding tissues; they also check whether it has spread to another part of the body

Basic pathological definitions

- **Hyperplasia**: increase in cell number. A reversible process which may be caused by hormonal stimulation (e.g. uterus during pregnancy) or loss of cells (e.g. regeneration of the squamous epithelium during the healing of a superficial skin wound)
- **Metaplasia:** replacement of one differentiated adult cell type by another differentiated adult cell type (e.g. replacement of squamous epithelium in the oesophagus by columnar epithelium - *Barrett's oesophagus*). Potentially reversible, however metaplasia may predispose to the development of neoplasia (irreversible).
- **Neoplasia** ("new growth"): results in an irreversible abnormal mass of tissue which exceeds and is uncoordinated with the normal growth of that tissue. It persists even in the absence of growth stimuli.
- Neoplasms can be **benign** (e.g. colorectal adenoma [a polyp]) or **malignant** (colon adenocarcinoma)

Grade describes how closely a neoplasm resembles the normal tissue it is derived from, and refers to the level of cellular differentiation