

## **New techniques and concepts in Pathology: applications in diseases of the GI tract.**

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There have been major changes in the role of pathologists and in the practice of Pathology in Gastroenterology since recent years.

The main improvements in the technical way of practising cyto- and histopathology include:

- The development and generalisation in the use of automated systems in routine workload, that allow fast and reproducible standard techniques.
- The changes in the use of techniques other than routine stainings, with a dramatic decrease in techniques such as electron microscopy or histoenzymology, and a major development of immunohistochemistry (IHC). This technique is now performed daily in most departments of pathology, and plays a role in diagnostic, prognostic, genetic and even in therapeutic evaluation of patients, especially in oncology.
- The implication of pathologists in the use of molecular biology, that leads to a new “subspecialty”, molecular pathology. This includes the use of morphological molecular techniques such as *in situ* hybridisation, *in situ* PCR, FISH, CISH etc.
- The development of new techniques that improve very much the preparation of tissue specimens for molecular biology techniques and proteomic analysis. Tissue microdissection (most often laser assisted) and tissue arrays technology are the two most significant novelties in this field.
- The central role of pathology and pathologists in the constitution of centres of biological resources, with collections of biological material useful for diagnostic and research purposes. These collections of biological material raise numerous ethical and legal problems in most countries, as exemplified recently in the UK (1).

Parallel to these technical changes, there have been changes in the way of reporting diseases by GI pathologists: use of standardised reports especially in oncology, use of new classifications (for example Sydney system for the classification of gastritis, Vienna classification for GI neoplasia etc.), description of new entities (for example microscopic colitides) or redefinition of diseases already described (Barrett's oesophagus...) based entirely on histological diagnosis, reclassification of old entities into new categories based on histological and immunohistochemical diagnosis; GISTs (gastrointestinal stromal tumors) are the most impressive example of this later group: old disease (leiomyomas, schwannomas etc.), new concept (Cajal cells leading to GIST due to c-kit mutation), new diagnostic method (c-kit immunoreactivity), and new treatment (anti-c-kit) based on IHC and/or mutational analysis. However, there are counterexamples of this morphological and immunohistochemical driven treatment: it was considered until recently that anti-EGFR treatment of metastatic colorectal cancer was indicated only in patients with tumours expressing EGFR on IHC, but this position has been challenged by several reports (2).

This current position of Pathology in the diagnosis of GI diseases may well be challenged in the near future, as progresses in endoscopy and radiology may allow the practice of “virtual biopsies”, without the need of histological sampling (3). These improvements may lead to the redefinition of the field of expertise of GI pathologists.

### References:

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- 3 - Scoazec J-Y. Tissue and cell imaging in situ: potential for applications in pathology and endoscopy. *Gut* 2003;52(Suppl IV):iv1-iv6.