Pathology is the branch of science dedicated to the study of the structural, biochemical, and functional changes in cells, tissues, and organs that underlie disease. The Histopathology Unit offers support and expertise in a range of services from paraffin embedding and tissue sections to histochemical staining, research and diagnostic immunohistochemistry (IHC) testing, antibody validation, in situ hybridisation techniques (including RNA in situ detection using RNAcoreScope and BaseScope), as well as tissue microarray generation. Other value-added services offered by the highly skilled technicians of the Unit include laser capture microdissection, slide digitisation, image analysis, and reclassification of tissues. The Unit is involved in the analysis of the pathological characteristics and mechanisms that mediate cell death in cardiac tissue after ablation of atrial fibrillation.

The high quality of the techniques run by the Unit continues to be endorsed by External Quality Assessment Schemes. For example, our histochemical techniques were evaluated by UK NEQAS. On the other hand, NordiQC and SKAP (Sociedad Española de Anatomía Patológica) evaluated a subset of our IHC techniques under different modules, obtaining very good scores.

Training and outreach activities are also a key component of the Unit’s activities. We had 1 student of FP Grados Superior en Anatomía Patológica in the lab for 3 months, developing a practical module. Finally, the Unit staff also participated in 2 master’s courses on oncology research.

RESEARCH HIGHLIGHTS

In 2023, the Unit increased its workload, with the number of histological techniques performed (more than 12,000) 40% higher than in 2022. In addition, around 23,000 immunohistochemistry (IHC) techniques were performed (20% of them double and triple immunostaining), an increase of approximately 10%. Beyond this, 80 new antibodies have been optimised and made available to users, so the Unit has a portfolio of more than 920 antibodies available for IHC staining, including mice, humans, and xenograft tissues. Furthermore, a total of 19,300 slides were digitised, which is 10% above 2022. About 13% of this digitised material has been analysed with the support of the Unit, training researchers in the use of several image analysis software platforms.

We also consolidated the application of in situ hybridisation technology focusing on mRNA detection to paraffin-embedded tissue sections using RNAcoreScope technology. Along the same lines, we incorporated BaseScope, which allows the detection of smaller RNA molecules, such as microRNAs. As many as 383 cases were analysed, some of them with double staining, using the Ventana-Roche’s automated platform for IHC staining.

We continue our collaboration in the project focused on developing a system for the treatment of atrial fibrillation by irreversible electroporation, together with the company MedLumics and the Universitat Pompeu Fabra. The Unit is involved in the analysis of the pathological characteristics and mechanisms that mediate cell death in cardiac tissue after ablation of atrial fibrillation.

**PUBLICATIONS**