MONOCLONAL ANTIBODIES CORE UNIT

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Titulado Superior (Advanced Degree)

OVERVIEW

The Monoclonal Antibodies Unit provides CNIO and other national and international research groups with the capability to generate "à la carte" monoclonal antibodies (mAbs) that are used as research tools to isolate, identify, and characterise new pathways relevant to cancer diagnosis, prevention, and treatment.

Our mAbs are useful tools to understand cancer biology and to diagnose neoplastic diseases, since they allow the identification of molecular markers that are selectively expressed by specific tumour subtypes.

We are particularly specialised in the production and validation of mAbs for immunohistochemistry (IHC), a technique that allows the localisation and study of proteins in tissue sections. This type of reagent allows for a more accurate diagnosis, resulting in a better classification of cancer and the selection of the most adequate cancer treatment.

"The Monoclonal Antibodies Unit is highly specialised in mAbs production and characterisation, providing CNIO researchers with reliable and well-validated reagents that give added value to their research projects."

The Unit also offers mAb characterisation and validation, medium-scale mAb production, as well as a service of *Mycoplasma* testing for the cell culture facility.

RESEARCH HIGHLIGHTS

During the last 22 years, the Monoclonal Antibodies Unit has generated a large number of mAbs, directed against more than 180 different antigens, mostly targeting molecules for which mAbs are not commercially available. Many of those mAbs (63) have been licensed to external companies, generating royalties that represent an important source of revenues for the CNIO.

Each year we prepare and update a detailed CNIO mAbs Catalogue, which contains the datasheets of more than 100 thoroughly validated, high-quality mAbs (accessible at http://www.cnio.es/ing/servicios/anticuerpos/default.aspx). This catalogue is offered to specialised companies looking for licensing opportunities.

Research activities:

National and international collaboration. In addition to our collaboration with the CNIO's Research Groups, during the last 22 years we have also developed many joint projects with groups from other national and international research institutions. In these collaborations, the scientists provide their extensive and profound knowledge of cancer research, generating fresh perspectives, diverse viewpoints, and innovative methodologies, which allow the targeting of proteins that play an important role in tumour transformation. We provide them with access to the generation of reliable tools (mAbs), useful both to confirm the results obtained, as well as to further investigate in their research field. In addition, we can develop and set up novel products that can lead to the generation of diagnostic tools for the prevention and diagnosis of cancer. Some of our most recent (last 2 years) and successful collaborations have been with the Spanish National Centre for Cardiovascular Research, *CNIC* (anti-ALDH14 mAb), the *Hospital Universitario Fundación Jiménez Diaz* (anti-hPIGR mAb), and the Centre for Cooperative Research in Biosciences, *CICbioGUNE* (anti-IL4I1 mAbs).

TACI (CD267) in lymphomas. In 2022, we produced and characterised a novel mAb against TACI protein (encoded by *TNFRSF13B* gene) that belongs to the tumour necrosis factor receptor superfamily. TACI, also known as CD267, promotes T-independent antibody production, in part by facilitating plasma cell differentiation. Since the distribution of CD267 in reactive and neoplastic lymphoid tissues has not been investigated, we are currently evaluating its expression using a novel rat monoclonal antibody (CLOE240B) against the CD267 intracellular domain, which recognises its target in paraffin-embedded tissue sections. Large series of normal tissues and B and T-cell lymphomas are being studied using whole sections and tissue microarrays. The aim is to determine the pathological diagnostic roles and clinical significance of the CD267 receptor in B-cell neoplasms.

EuroMAbNet. In 2008, in collaboration with Oxford University, we founded EuroMAbNet (www.euromabnet.com), a non-profit organisation that currently spans 13 European countries. EuroMAbNet's primary goal is to provide an arena for people working in the field of monoclonal antibody production and technology to exchange knowledge and updated methodologies, and to create common strategies to improve and standardise the production of properly validated antibodies. ■

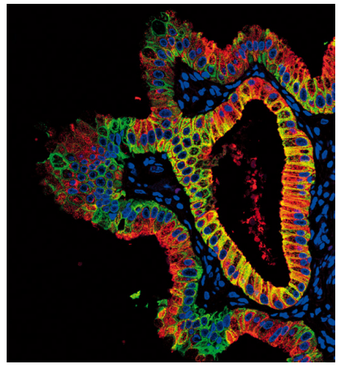

FIGURE 1 Double immunofluorescence staining of PIGR mAb (red) and cytokeratin (green) in paraffin section of human epithelium.

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