MONOCLONAL ANTIBODIES CORE UNIT

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OVERVIEW

The development of monoclonal antibody (mAb) technology has led to the generation of large panels of highly specific reagents that have had a tremendous impact on basic and applied research over the last four decades. MAbs have become indispensable tools for many of the laboratory techniques that are used to answer essential questions in biomedical research. Their outstanding specificity makes them excellent tools for enabling researchers to better understand biological processes; particularly in the investigation of new approaches for the diagnosis, prevention and treatment of cancer.

The Monoclonal Antibodies Unit provides CNIO Research Groups with an *à la carte* generation of mAbs. We are highly specialised in the production of mouse and rat mAbs. The Unit also offers mAb production in gene-inactivated mice, mAb characterisation and validation, medium-scale mAb production, and a service of *Mycoplasma* testing for the cell culture facility.

"The Unit produces novel and high quality mAbs for use in basic research in order to gain new insights into the human cancer development process. We are also highly specialised in mAb characterisation, thereby providing CNIO researchers with reliable and well-validated reagents that give an added value to their research projects."

RESEARCH HIGHLIGHTS

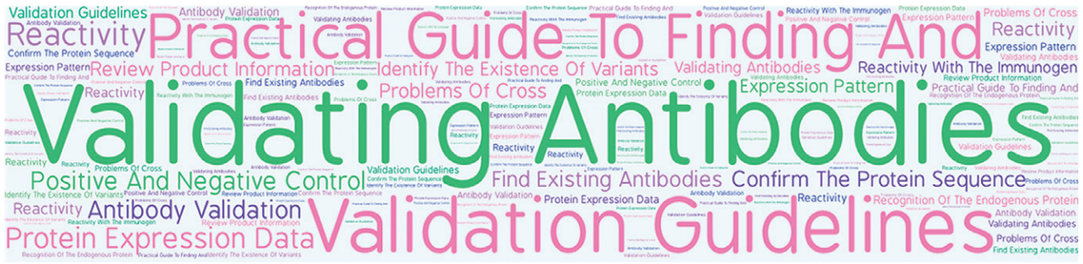

Figure Antibody validation cloud.

During the last 16 years, the Monoclonal Antibodies Unit has generated a large number of mAbs (against more than 130 different antigens), mostly targeting molecules for which mAbs are not commercially available. Many of those mAbs have been licensed to external companies, generating in turn royalties that represent an important source of revenue for the CNIO.

Each year we prepare and update a detailed CNIO mAbs catalogue, which contains the datasheets of more than 78 thoroughly validated high-quality mAbs (accessible at http:// www. cnio. es/ing/servicios/anticuerpos/default.aspx).

This year, in collaboration with the Custom Antibodies Service (CAbS) of the Institute for Advanced Chemistry of Catalonia of the Spanish Council for Scientific Research (IQAC-CSIC), we have successfully generated several mAbs against small molecules, compounds with low molecular weight such as vitamins, chemicals, hormones, etc., thus expanding our portfolio of reagents in this new field. We also established collaborations with several big pharmaceutical companies (e.g. Merck, Lilly) for the production of mAbs against molecules, of their interest, involved in cancer development.

EuroMAbNet and its commitment with Ab validation

In 2008, in collaboration with Oxford University, we founded EuroMAbNet (www.euromabnet.com), a non-profit organisation that includes internationally distinguished multidisciplinary academic laboratories specialised in antibody technologies. Their wealth of expertise ranges from the identification of new targets to the production of fully validated Abs and their use as research tools, clinically relevant diagnostic/prognostic reagents, and novel therapeutics.

The use of poorly characterised antibodies is of major concern to the scientific community, resulting in wasted time and valuable research funds, as well as in the publication and perpetuation of erroneous research results, which ultimately compromise the advancement of science. To address this problem, EuroMAbNet has published a position paper (Roncador *et al.*, 2016) and some easy to follow guidelines (http://www.euromabnet.com/guidelines) that provide a set of criteria and recommendations to help researchers select the most effective mAbs from those available in the market, and provide the strategic guidance needed to perform antibody validation.

EuroMAbNet also has a strong commitment to improving the education and training of junior scientists in Ab validation. With that in mind, we have started organising annual Antibody Validation Workshops (www.euromabnet.com) to provide practical guidelines about the principles underlying antibody validation, including the verification of Ab specificity, selectivity, sensitivity and reproducibility. These workshops outline the problems generated by the use of poorly validated reagents and educate researchers to minimise the purchase of ineffective Abs. ■

PUBLICATIONS

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- Wong KK, Gascoyne DM, Soilleux EJ, Lyne L, Spearman H, Roncador G, Pedersen LM, Møller MB, Green TM, Banham AH (2016). FOXP2-positive diffuse large B-cell lymphomas exhibit a poor response to R-CHOP therapy and distinct biological signatures. *Oncotarget* 7, 52940-52956.
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