Recently, the field of haematology has been gaining traction in cancer research, not only for the study of critical disease affecting human health, but also for its implications in solid cancers and the applicability of haematological tools to other areas.

In terms of cancer implications, immune cells play a remarkable role in metastasis, inflammation, and immune surveillance. In fact, this concept triggered the development of the most promising cancer therapy of the 21st century, immunotherapy.

Moreover, the haematology research area has been developing cutting-edge applications such as liquid biopsy, an easy peripheral blood/plasma analysis that can anticipate the appearance of disease, or the emergence of tumour clones in relapsed patients.

The following main lines of research define our laboratory:

- Liquid biopsy, minimal residual disease, and next-generation sequencing.
- Immunotherapy: NK/T-CAR, BITES and immune checkpoints in haematological and paediatric cancers.
- Role of hnRNP K, master regulator of tumorigenesis.
- Viral infection and cancer.

“We improved our in-house deep-sequencing analysis for measurable residual disease (MRD), revealing its value in decision-making for clinical trials and as a prognosis marker.”

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“Plan de Empleo Joven (Youth Employment Plan, Community of Madrid)”

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Impact of prolonged maintenance of the immunomodulatory drug lenalidomide in multiple myeloma

Lenalidomide is an immunomodulatory drug approved for maintenance treatment in newly diagnosed multiple myeloma, and it has been shown to improve progression-free survival (PFS) and, in several studies, overall survival. Nevertheless, the impact of prolonged treatment with lenalidomide on the kinetics of minimal residual disease (MRD) and its prognostic impact have not been studied in depth. To obtain better knowledge in this regard, we retrospectively analysed 139 patients who received lenalidomide maintenance in real-world clinical practice and whose MRD levels were observed during the treatment period by multiparametric flow cytometry or next-generation sequencing with a sensitivity of at least $10^{-4}$. Lenalidomide maintenance correlated with an increased depth of the disease response, with $38.8\%$ of patients achieving continuously deeper response during lenalidomide treatment compared with $34.3\%$ of patients who were MRD positive after induction treatment achieved MRD-negative status during maintenance and ultimately had improved PFS. Serial MRD assessments identified patients with progressively decreasing MRD levels who also had better PFS outcomes, compared with patients not showing a decreasing pattern of MRD.

These results support the role of maintenance therapy, not only to sustain, but also to increase the depth of disease response with a PFS benefit. In addition, MRD monitoring during maintenance identifies patients with better prognosis and may help in their clinical management. (Work published in Blood Advances).

FIGURE 1

MRD deep-sequence in-house evaluation predicts clinical outcome in patients with relapsed multiple myeloma. (A) BF curves from (A) patients with $≥10^{-3}$ MRD positive samples, (B) patients with detectable but continuously declining clonal numbers, and (C) patients with stable or increasing clonal number (≥ $10^{-3}$). PFS was superior in groups A and B vs C ($P < 0.001$). Right: Dynamic of MRD values during multiple myeloma progression, (B) MRD depletion with detectable but continuously declining clonal numbers, and (C) patients with stable or increasing clonal number (≥ $10^{-3}$). PFS was superior in groups A and B vs C ($P < 0.001$).