



MÁSTER EN INVESTIGACIÓN BIOMÉDICA
Research Project Proposal
Academic year 2026-2027

Project Nº: 57

Title: *Characterization of the immune cell repertoire in patients with myeloid neoplasia*

Department/ Laboratory

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Summary

Myelodysplastic syndromes (MDS) are clonal neoplasias characterized by marked clinical and genetic heterogeneity and poor patient outcomes. Dysregulation of antitumoral immunity has emerged as a potential therapeutic opportunity in MDS, however the nature and functional relevance of T-cell responses remain poorly understood.

Our group's results revealed previously unrecognized alterations in the bone marrow immune landscape of MDS patients, including paradoxical CD4 T-cell activation, impaired TCR-dependent responses, and the emergence of T helper 17 (Th17) and type 1 regulatory (Tr1)-like CD4 T cells. Based on this, we hypothesize that immune evasion in MDS is driven by defective antigen-specific CD4 T-cell responses and the polarization of CD4 T cells toward dysfunctional regulatory states.

Our current research's objectives are to identify microenvironmental signals that drive dysfunctional CD4 T-cell polarization and evaluate both antigen-dependent and antigen-agnostic strategies to restore effective antitumoral T-cell immunity. To this end, we analyze primary patient samples using single-cell multi-omics, functional immunology, immunoproteomics and translational assays.

By elucidating actionable mechanisms of CD4 T-cell dysfunction, we expect to generate new insights into immune control in MDS, advancing the conceptual foundations of immunology in hematological malignancies and opening novel data-driven avenues for immunotherapies.

yes	
no	X

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?