Very short Biosketch David Sancho:

PI. David Sancho, PhD. Full Professor and group Leader at Centro Nacional de Investigaciones Cardiovasculares (CNIC, Madrid). Clinical specialization in Immunology and PhD (2003) in La Princesa Hospital/UAM. I took a postdoctoral position at the London Research Institute (Cancer Research UK, 2004-2009) where I found a new C-type lectin (DNGR-1/CLEC9A). On my return to Spain, I established my independent laboratory at CNIC (2010). At the Immunobiology we work on sensing of microbes and tissue damage by macrophages and dendritic cells with particular focus on immunometabolism.

Keywords

Dendritic cell, macrophage, mitochondria, metabolism, immunotherapy

Biosketch David Sancho:

PI. David Sancho, PhD. Full Professor and group Leader at Centro Nacional de Investigaciones Cardiovasculares (CNIC, Madrid). BS, 1995, First National Prize; PhD and First Class Honours distinction, 2003. I performed my clinical specialization in Immunology (1996-2000) and my PhD (2000-2003) in La Princesa Hospital/UAM. I took a postdoctoral position at the London Research Institute (Cancer Research UK, 2004-2009) where I found a new C-type lectin (DNGR-1/CLEC9A) that selectively marks the population of human and mouse dendritic cells (DCs) that cross-present antigens in MHC-I, using this selective expression to target DCs for tumor immunotherapy (JCI, 2008). Our work additionally established the function of DNGR-1/CLEC9A in cross-priming in vivo (Nature, 2009).

On my return to Spain, I established my independent laboratory at CNIC (2010). At the Immunobiology lab funded by National Funding and also with the ERC Starting Grant (2010-2016), we found that cross-presentation via DNGR-1 facilitates CD8+ T cell responses to cytopathic viruses (JCI 2012) and greatly contributes to priming of precursors of resident memory CD8+ T cell (Trm) precursors (Immunity, 2016a), key cells that can contribute to anti-tumor immunity (Nat. Commun. 2017). Notably, DNGR-1 is a C-type lectin receptor with an activating motif that couples to non-receptor tyrosine kinase activation but we found that it can also activate tyrosine phosphatases and inhibit inflammation driven by tissue damage (Science 2018). My lab established the concept of C-type lectin receptors signaling dually via kinases and phosphatases and showed that this can impact the outcome of infection (J. Immunol. 2015; Immunity, 2016b; Cell Reports 2018a). We also advanced our understanding of the relevance and function of cDC1s in pathologies like Leishmania infection (Eur. J. Immunol. 2015), asthma (JCI insight 2017), obesity (Cell. Mol. Immunol. 2022) and cancer immunotherapy (Cancer Discov. 2016; JITC 2019, Nat. Rev. Immunol. 2020; JITC 2021).

An independent branch of research funded by the ERC Consolidator Grant (2017-2023) focuses on immunometabolism research on myeloid cells. We have established how innate sensing in macrophages can affect mitochondrial complexes, resulting in enhanced cytokine production and affecting the polarization of macrophages (Nat Immunol. 2016; Nat Metab. 2020). Our research on triggers of mitochondrial metabolism in myeloid cells led to the identification of ImP as a trigger for myeloid cell metabolism, which is the origin of the current proposal. The induction of trained immunity in innate cells, mainly macrophages and how innate sensing in DCs and macrophages can reporpuse mitochondrial metabolism for cytokine production and have allowed us to collaborate with Inmunotek S.L. (Alcalá de Henares, ongoing collaboration since 2017, current agreement until 2024) to decipher the mechanisms underlying the efficacy

of a polybacterial preparation in protection against heterologous infections in clinical trials. We demonstrated that this preparation can protect against viral infections and increase the immunogenicity of antigen-specific vaccines (Cell Reports 2018a; Cell Reports 2018b; Front. Immunol 2021; Cell Reports 2022).

My work has more than 10000 cites (WOS, with more than 90 cites average per main author article, H index=53). I have led highly cited reviews in immunology and immunotherapy (Cell. Mol. Immunol. 2021; Curr. Opin. Immunol. 2021; Nat. Rev. Immunol. 2020; Annu. Rev. Immunol. 2012).