The Unit’s activity is divided into 2 main areas:

1. Genetic diagnosis of cancer patients, especially those at a young age, with multiple tumours or other family members with cancer. Elucidating hereditary cancer helps the physician to decide on appropriate treatment and, for risk relatives, to initiate preventive strategies if they are carriers. We work mainly with colorectal cancer/Lynch syndrome relatives, to initiate preventive strategies if they are carriers.

2. Research work on the elucidation of genetic factors related to familial breast and colorectal cancer. We focus on identifying new driver genes and clarifying their role in patient management. In addition, we are interested in genetic risk factors, prognostic markers, and genetic and molecular factors that could affect therapeutics.

"The Familial Cancer Clinical Unit (FCCU) has confirmed RECQL5 as a novel breast cancer gene and has been involved in understanding the role of OGG1, BRCA carrier modifiers, and the first germline biallelic mutation in MADIL1."

Clinical and diagnostic activity. The catalogue of genes has been updated and expanded to tumours that were not previously covered. 729 patients visited our consultancy at the UHF, and 1884 genetic studies were carried out in the FCCU laboratory.

Elucidating new breast cancer (BC) genes. We found a statistically significant association between loss-of-function variants in the RECQL5 gene and BC risk in almost 2000 index cases of Spanish BC families, supporting its role as a novel moderate-risk BC gene.

Understanding the role of new variants in moderate-risk BC genes. Through a mutational analysis of the BARD1 gene, in a cohort of 9466 Spanish patients with BC using NGS, we saw that the prevalence and spectrum of BARD1 mutations could vary between different regions of Spain and highlighted the relevance of analysing copy number variations.

New BC therapeutic approaches. Osorio was involved in the discovery that TH447, an inhibitor of 8-oxoguanine DNA glycosylase 1 (OGG1), increases sensitivity to the PARP inhibitor Olaparib, especially in the context of BRCA1 deficiency. She was also involved in the description of TH0785, which increases OGG1 recruitment and repair of oxidative DNA damage that may have therapeutic applications.

Contributions to the diagnosis and clinical follow-up of PTEN hamartoma tumour syndrome (PHTS). In the largest study performed in the Spanish population with clinical features of PHTS (n = 145), we concluded that to improve clinical management of PHTS (n = 145), we concluded that to improve clinical management of PHTS (n = 145), we concluded that to improve clinical management of PHTS (n = 145), we concluded that to improve clinical management of PHTS (n = 145), we concluded that to improve clinical management of PHTS (n = 145), we concluded that to improve clinical management of PHTS (n = 145), we concluded that to improve clinical management of PHTS (n = 145), we concluded that to improve clinical management of PHTS. PHTS patients are considered to have a syndrome of aneuploidy with high tumour susceptibility. The study performed in the Spanish population suggests that RECQL5 is the only RECQL5 aneuploidy with high tumour susceptibility.

Predicted structure of MAD2 and the position of the G66 and E628 mutated residues. (A) Pedigree of the family. (B) Schematic representation of the MAD1 protein and the mutations found in the proband. (C) Predicted MAD2 interaction motif. (D) Selective expression of MAD1 and MAD2 in tumour tissues. (E) Functional analysis of PHTS variants in tumours. (F) MAD1 and MAD2 expression in PHTS tissues. (G) Functional analysis of PHTS variants in tumours. (H) MAD1 and MAD2 expression in PHTS tissues. (I) MAD1 and MAD2 expression in PHTS tissues. (J) MAD1 and MAD2 expression in PHTS tissues. (K) MAD1 and MAD2 expression in PHTS tissues. (L) MAD1 and MAD2 expression in PHTS tissues. (M) MAD1 and MAD2 expression in PHTS tissues. (N) MAD1 and MAD2 expression in PHTS tissues. (O) MAD1 and MAD2 expression in PHTS tissues. (P) MAD1 and MAD2 expression in PHTS tissues. (Q) MAD1 and MAD2 expression in PHTS tissues. (R) MAD1 and MAD2 expression in PHTS tissues. (S) MAD1 and MAD2 expression in PHTS tissues. (T) MAD1 and MAD2 expression in PHTS tissues. (U) MAD1 and MAD2 expression in PHTS tissues. (V) MAD1 and MAD2 expression in PHTS tissues. (W) MAD1 and MAD2 expression in PHTS tissues. (X) MAD1 and MAD2 expression in PHTS tissues. (Y) MAD1 and MAD2 expression in PHTS tissues. (Z) MAD1 and MAD2 expression in PHTS tissues.

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