### REFERENCIA PROYECTO
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### TITULO PROYECTO
Análisis y aplicación de la variación somática para la innovación varietal de la vid

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Wine industry is one of the most important in the national agri-food sector, both economically and socially. Its sustainability can be threatened by changes in the market (competition, consumer tastes, limitation of pesticide use) and climate change (drought, pests). Both types of threats require multiple solutions that address the improvement of grape production and winemaking systems. Among the former, varietal innovation is a priority: selection of varieties and clones better adapted to the new requirements. There is a great varietal diversity in Spain, but the real situation is that three varieties (Tempranillo, Airén and Bobal) represent more than 50% of the planted area. This fact, in addition to the difficulty of introducing new varieties in the wine market, makes it possible to foresee that varietal innovation in the next decades will go through the selection of clones in the existing elite varieties. Plants of vine varieties have been accumulating somatic mutations throughout their vegetative multiplication, for several centuries in many cases. This somatic variation is the basis of clonal selection, and of new varieties sometimes, but its use has hitherto been purely empirical. The general objective of this project is to know the origin, the dynamics and the genetic and molecular basis of somatic variation in grapevine.

In our group, we have considerable previous experience in the characterization of grapevine somatic variants. This proposal is born from this experience, firstly for the choice of the main object of study, Tempranillo variety, which is the most important of the Spanish viticulture, and for which we know many somatic variants of great interest. Secondly, for perceiving the lack of knowledge about the dynamics of mutation in grapevine varieties, which has given rise to the first two specific horizontal objectives: 1) Quantification of somatic variation accumulated in the variety Tempranillo; 2) Estimation of somatic mutation rates in grapevine. Third, the experience of previous projects in three traits of great interest in viticulture, for which we have studied in greater or lesser depth various somatic variants of Tempranillo, has given rise to the three remaining objectives. These objectives focus on the analysis of phenotypic, genetic and molecular variation in Tempranillo for relevant characteristics in the diversification of the final product, in the production and elaboration of quality grape and wine, or in adapting to new climatic conditions: 3) Characterization of somatic variants of Tempranillo for the color of the berry; 4) Genetic and molecular characterization of somatic variants of Tempranillo with low cluster compactness; 5) Identification of the genes and gene variants responsible for the somatic variation identified for the ripening time in Tempranillo variety. Through genetic and genomic strategies, we will identify which genes and gene variants are responsible for the phenotypic variation in the studied Tempranillo plants, which will allow the development of molecular markers for the identification and monitoring of somatic variants for commercial purposes, for their use in marker assisted breeding programs or for future genomic editing.