

Project: Precision Genome Engineering with Prime Editing and Programmable Recombinases for the Development of NGT-Compatible Crops

Investigadores: Marta Vázquez and Diego Orzaez

The Plant Genomics and Biotechnology lab applies synthetic biology, genomics, and biotechnology to engineer new functions in plants. We are offering a Master's Thesis position for a student interested in plant synthetic biology and precision genome engineering, at the intersection of molecular design and the new European regulatory framework for New Genomic Techniques (NGTs).

Two of the most promising tools for generating NGT-compatible crops, Prime Editing and programmable recombinases, share a practical limitation: assessing their performance typically relies on sequencing, which is accurate but slow and costly, limiting how many designs can be compared. This project addresses that bottleneck by developing luminescent reporter systems in which a successful editing or recombination event switches a bioluminescent signal on or off, giving a fast, quantitative and scalable readout. These reporters will then be used to screen multiple editing and recombination designs in parallel, identifying the best-performing variants ahead of validation in regenerable plants.

The student will work across the full pipeline, from reporter design and molecular cloning to transient expression assays, luminescence-based screening, and confirmatory molecular analysis, gaining hands-on experience in modular DNA assembly, Prime Editing and recombinase systems, alongside an applied understanding of the current NGT regulatory landscape.

Contact information: dorzaez@ibmcp.upv.es; marvazvi@ibmcp.upv.es