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Poster Abstract – D.13

REGULATION OF FLOWERING TIME BY VERNALIZATION IN *CHICORIUM INTYBUS* L.

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In biennal and winter annual ecotypes of *Arabidopsis thaliana*, flowering is typically blocked in the first growing season. Exposure to prolonged cold temperature, in a process called vernalization, is required to remove this block and permit flowering in the next growing season. In late-flowering ecotypes of *Arabidopsis*, a flowering repressor, *FLOWERING LOCUS C* (*FLC*), is expressed at such high level to inhibit flowering in the first growing season. The delayed flowering is due to dominant alleles of *FRIGIDA* (*FRI*) and *FLC*. FRI elevates expression of *FLC* to levels that suppress flowering. FLC inhibits the transition to flower by repressing the expression of the genes named Floral Pathways Integrators (such as *LFY, FT* and *SOC1*). These genes are able to integrate a balance of stimulations originating from the different pathways inducing flowering and convert these inputs into an induction of FMI (Floral Meristem Integrators) genes, thereby initiating the production of the first floral meristems.

Vernalization is the main process promoting flowering by the repression of FLC. Therepression involves epigenetically stable modifications in FLC chromatin that include dimethylation of histone H3 at Lys9 (H3K9) and Lys27 (H3K27). Summer-annual accessions of *Arabidopsis* flower rapidly without vernalization, due to a mutation in an active FRI allele or due to the presence of a weak FLC allele; in both cases the levels of FLC expression is low compared to the wild type.

Wild chicory (*Chicorium intybus* L.) is a biennial species which requires vernalization to flower. Chicory is economically important for its use as vegetable and as an industrial raw material to obtain inulin from roots. In Italy different types of chicory (the so called italian red and variegate types) have been selected by farmers. These types show quite different classes of precocity in relation to flowering.

We are investigating the molecular mechanism that regulate the switch to flower in chicory, to verify whether such mechanism is the same that controls flowering in *Arabidopsis*, and finally, address the diversity of the classes of precocity to one of the cases known for this model plant. A cDNA sequences with high homology to AtFLC was identified and a detailed expression analysis was carried out in chicory plants. Transgenic arabidopsis and chicory plants will be produced to functionally characterize this gene.