

植物非编码RNA调控春化作用的表现遗传

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摘要 在自然界中许多高等植物需要通过冬季的低温阶段实现从营养生长到生殖生长的时期转化, 这一生物学过程称作春化作用。小麦 (*Triticum aestivum* L.) 和油菜 (*Brassica napus* L.) 等作物以种子为产品器官, 生产上往往通过茬口安排和栽培措施使植株尽早通过春化作用, 以促进花芽形成和花器官发育, 而大白菜 (*B. rapa* ssp. *pekinensis*) 和甘蓝 (*B. oleracea*) 等作物以叶球等营养器官作为产品器官, 生产上则设法避免低温引起的春化作用, 以保证产品器官的充分生长。FLOWERING LOCUS C (FLC) 作为一种重要的开花抑制蛋白负调控春化作用, 参与植株从营养生长向生殖生长的转化过程。文章综述了春化中 FLC 表达受抑制主要通过低温诱导表达 FLC 基因区域的非编码RNA以及 VRN1、VRN2、VIN3 等蛋白参与介导组蛋白甲基化, 从而在表现遗传上控制春化作用的进程和产品器官的正常发育。

关键词: FLC 表现遗传 春化作用 非编码RNA 天然反向转录本

Abstract: Many higher plants must experience a period of winter cold to accomplish the transition from vegetative to reproductive growth. This biological process is called vernalization. Some crops such as wheat (*Triticum aestivum* L.) and oilseed rape (*Brassica napus* L.) produce seeds as edible organs, and therefore special measures of rotation and cultivation are necessary for plants to go through an early vernalization for flower differentiation and development, whereas the other crops such as Chinese cabbage (*B. rapa* ssp. *pekinensis*) and cabbage (*Brassica napus* L.) produce leafy heads as edible organs, and additional practice should be taken to avoid vernalization for a prolonged and fully vegetative growth. Before vernalization, flowering is repressed by the action of a gene called *Flowering Locus C* (FLC). This paper reviewed the function of non-coding RNAs and some proteins including VRN1, VRN2, and VIN3 in epigenetic regulation of FLC during vernalization.

Keywords: FLC, epigenetics, vernalization, non-coding RNA, natural antisense transcripts

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