1. Record Nr. UNINA9910346757003321

Autore	Jose M. Romero
Titolo	Evolution of Gene Regulatory Networks in Plant Development
Pubbl/distr/stampa	Frontiers Media SA, 2018
Descrizione fisica	1 online resource (252 p.)
Collana	Frontiers Research Topics
Soggetti	Botany & plant sciences
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

Sommario/riassunto

During their life cycle plants undergo a wide variety of morphological and developmental changes. Impinging these developmental processes there is a layer of gene, protein and metabolic networks that are responsible for the initiation of the correct developmental transitions at the right time of the year to ensure plant life success. New omic technologies are allowing the acquisition of massive amount of data to develop holistic and integrative analysis to understand complex processes. Among them, Microarray, Next-generation Sequencing (NGS) and Proteomics are providing enormous amount of data from different plant species and developmental stages, thus allowing the analysis of gene networks globally. Besides, the comparison of molecular networks from different species is providing information on their evolutionary history, shedding light on the origin of many key genes/proteins. Moreover, developmental processes are not only genetically programed but are also affected by internal and external signals. Metabolism, light, hormone action, temperature, biotic and abiotic stresses, etc. have a deep effect on developmental programs. The interface and interplay between these internal and external circuits with developmental programs can be unraveled through the integration of systematic experimentation with the computational analysis of the generated omics data (Molecular Systems Biology). This Research Topic intends to deepen in the different plant developmental pathways and how the corresponding gene networks evolved from a Molecular

Systems Biology perspective. Global approaches for photoperiod, circadian clock and hormone regulated processes; pattern formation, phase-transitions, organ development, etc. will provide new insights on how plant complexity was built during evolution. Understanding the interface and interplay between different regulatory networks will also provide fundamental information on plant biology and focus on those traits that may be important for next-generation agriculture.