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Sommario/riassunto

Plants are made up of a large number of distinct cell types that originate from a single fertilized egg cell. How the diversity of cell types arise in appropriate places is one of the most fascinating and attractive research areas of plant biology. During the past several decades, due to the development of new molecular techniques and tools, advances in optical microscopy, and availability of whole genome information and mutants in the model plant Arabidopsis and other plants, great advances have been made in understanding the mechanisms involved in cell fate determination in plants. Multiple mechanisms are used to generate cellular diversity. Asymmetric cell division is one of the primary mechanisms. As an example, asymmetric cell division enables one stem cell to generate a stem cell daughter and a daughter with a distinct identity. Initially equivalent cells can also differentiate to generate different cell types. This mechanism has been clearly demonstrated in the formation of multiple cell types during epidermis development in the shoot and root. Cell fate determination is influenced by both intrinsic factors, i.e, developmental regulators, as well as extrinsic signals, i.e., environmental stimuli. By using model systems like stomata, trichome, root hair and shoot and root apical meristem cells, ligands, receptors and transcription factors have been found to regulate cell fate determination. However, the details of signaling cassettes responsible for cell fate determination remain largely unknown. Plants are made up of a large number of distinct cell

types that originate from a single fertilized egg cell. How the diversity of cell types arise in appropriate places is one of the most fascinating and attractive research areas of plant biology. During the past several decades, due to the development of new molecular techniques and tools, advances in optical microscopy, and availability of whole genome information and mutants in the model plant Arabidopsis and other plants, great advances have been made in understanding the mechanisms involved in cell fate determination in plants. This research topic contains 12 collected articles, including 2 Opinion Articles, 5 Reviews, 4 Mini Reviews, and 1 Original Research Article. Hopefully, these articles will expand our understanding of the regulation of cell fate determination in plants.