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Clonal Analysis of Stomatal Development and Patterning in *Arabidopsis* LeavesLaura Serna <sup>1</sup> ... Carmen Fenoll<sup>1</sup> Show more<https://doi.org/10.1006/dbio.2001.0506>[Get rights and content](#)Under an Elsevier [user license](#)[open archive](#)

## Abstract

Cell lineage has been used to explain the stomatal distribution in several plant species. We have used transgenic plants carrying a 35SGUS::Ac construct that produces clonal sectors to analyze the possible role of cell lineage during the establishment of stomatal patterning in *Arabidopsis* leaves. The analysis of sectors ranging from two to eighteen cells supports the conclusion that most stomatal complexes derive from a single and immediate precursor cell through a stereotyped pattern of three unequal cell divisions followed by a final equal one. In addition, it shows that the successive cell divisions take place at a constant angle (approximately 60°) with respect to the previous one. Interestingly, this angular dimension shifts from 60° to 0° in the last cell division that gives rise to the stoma. These sectors also reveal the development of both clockwise and counterclockwise patterns of cell divisions during stomatal development in approximately equal numbers. Our clonal analysis indicates that cell divisions involved in the development of stomatal complexes are probably the last ones contributing to epidermal growth and development. Finally, the stereotyped pattern of cell divisions that culminates in the formation of stomatal complexes indicates that cell lineage plays a very important role during stomatal pattern establishment.


## Keywords



*Activator* element; anisocytic stomatal complex; *Arabidopsis*; clockwise; clonal analysis; counterclockwise; epidermis; monoclonal; polyclonal; stomatal pattern

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