

**PCC-ASSOCIATED EVENTS IN THE ROOT CELLS OF *VICIA FAB*A**

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Checkpoint pathways perform a fundamental role in maintaining genome stability by ensuring the precise replication and distribution of chromosomes between two daughter cells during mitosis. The S-M replication checkpoint prevents mitosis in response to unreplicated DNA until the completion of S phase. Caffeine (a putative inhibitor of Rad3-like protein kinases), 2-aminopurine (CDK inhibitor), and sodium vanadate ( $\text{NaVO}_3$ ; a protein phosphatase inhibitor) allow hydroxyurea-blocked cells to override the intra-S-phase checkpoint and to induce premature condensation of incompletely replicated chromosomes (PCC). Electron microscopic studies of *Vicia faba* root meristem cells show that, depending on the chemical agent applied to induce PCC, the ultrastructures of interphase and mitotic cells have some characteristic features, including both chromatin condensation and the changed appearance of cytoplasmic structures (mitochondria and plastids). Long-term experiments showed that root cells displaying PCC become transferred into apoptotic cells.