

MONIKA REWERS

Laboratory of Molecular Biology and Cytometry, Department of Plant Genetics, Physiology and Biotechnology, UTP University of Science and Technology, Kaliskiego Ave. 7, 85-796 Bydgoszcz, E-mail: mrewers@utp.edu.pl

MOLECULAR MECHANISM OF ENDOREDUPLICATION IN HIGHER PLANTS

Summary

Endoreduplication represents an alternative form of the cell cycle in which nuclear DNA amplification occurs, but it is not followed by mitosis and cell division. The molecular mechanism of this process is largely based on proteins involved in typical cell cycle and involves block of mitosis and re-initiation of DNA replication. Cyclin-dependent kinases and their regulatory proteins – cyclins are the key components of endoreduplication. During the process, activity of these proteins is regulated at the transcriptional and post-translational levels. Changes in the activity of cyclin dependent kinases may be due to a reduced availability of cyclins resulting from blocking of respective genes transcription and to changes in the status of cyclin-dependent phosphorylation of kinases. It can be also negatively regulated by phosphorylation of the cyclin-dependent kinase subunit by kinase WEE1, and by interaction with inhibitors of cyclin dependent kinases. Post-translational regulation occurs *via* targeted destruction of cyclins by the anaphase promoting complex/cyclosome. A detailed discussion of the molecular mechanism of these processes is presented in this article.

Key words: CDK, cyclins, endocycle, endopolyploidy, polysomaty