

(37)

AN INCLINATION OF ADK FOR CYTOKININ ISOMERS DURING THE CELL CYCLE OF TOBACCO BY-2 CELL LINE

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Recently, we identified four tobacco BY-2 adenosine kinase isoforms and suggested that some of them may act specifically in the cell cycle G2/M checkpoint, by reducing the pool of active cytokinins. In the following HPTLC based study, we show that cis-ZR and iPA are, in contrast to trans-ZR, the preferred cytokinin substrates for the recombinant tobacco ADKs. Moreover, the conversion of cis-ZR to ZMP is reduced, in a competitive manner, in the presence of trans-ZR and trans-Z. We demonstrate that the activity of endogenous ADKs varies dependently on the substrate used in the analysis during the course of the cell division. With the use of Ado the ADK activity peaks at the end of S phase, whereas with cis-ZR used as the substrate, the activity peak is visibly shifted towards M phase. These results and detection of a premitotic peak of cis-Z in BY-2 cells is in agreement with the increasing amount of evidence on the potential function of free cis-cytokinins in plants.

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