STUDYING OF 14-3-3 PROTEIN FUNCTION IN TRANSGENIC POTATO

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The 14-3-3 proteins were identified as a family of an abundant, acidic proteins. Since their discovery several different functions have been proposed for these proteins. They are highly conserved and are found in a broad range of organisms including mammals, insects, yeast and plants. They are believed to interact with many cellular proteins (amongst others with SPS, NR and H\(^+\)-ATPase) thereby modifying their function.

We have cloned six 14-3-3 isoforms from potato and one from Cucurbita pepo. Transgenic potato plants either over- or underexpressing 14-3-3 proteins were created and analysed both phenotypically and biochemically. Plants overexpressing 14-3-3 had a longer vegetation period and a higher number of tubers with unchanged their fresh weight per plant. The 14-3-3 antisense plants had a slightly shortened vegetation period and about 20% increase in a fresh weight of tubers per plant. However the starch levels within these plants were only slightly modified.

We also analysed these plants biochemically. The activity levels of different cellular enzymes interacting with 14-3-3 as well as some known not to interact with 14-3-3 were measured. Using a gas chromatograph combined with mass spectrometer (GCMS) the level of several metabolites was measured.

This data will be discussed in relation to the function of 14-3-3 proteins in integration of cellular metabolism.