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## BARLEY ACT7 HOMOLOGUE IS UP-REGULATED IN RESPONSE TO UV-C RADIATION

Plant genome reacts to ultraviolet radiation by altering the transcriptional pattern of some genes leading to the activation of complex cellular defence mechanisms. Whilst, intensive research and achievements have been obtained in this area, new networks and players of plant's response to UV-stress continue to emerge. In this study we found that barley actin gene was strongly up-regulated in the leaves barley seedlings exposed to UV-C. Plants were subjected to acute UV-C irradiation and left for recovery under dark condition or under high-intensity light. RNA was isolated from the irradiated and non-irradiated leaves collected at different time-points up to 24 hours post-irradiation. The expression pattern of actin gene was characterized by both semi-quantitative and quantitative RT-PCR; 18S rRNA served as reference control. Several-fold induction of barley actin gene was found in the green leaves 3h after treatment and increased further at 6h time-point. In the etiolated leaves the up-regulation was delayed and registered at 6h and 24h post-irradiation. Significant increase in the mRNA levels was also detected in the irradiated etiolated seedlings kept in dark for 24h. No changes were found in the respective non-irradiated controls. High-resolution melting analysis followed by sequencing revealed that the amplified fragment corresponded to a unique mRNA designated as actin 7 in the IPK-Gatersleben Barley Database and the NCBI blastp analysis matched the predicted protein predominantly to actin 7 in the closely related species. In plants ACT7 isotype is known as the actin responsive to external stimuli such as hormone treatment and pathogen attack. Our study showing transcriptional activation of ACT7 homologue in the UV-C irradiated barley seedlings is the first one linking a member of the actin family with the UV defence response in plants.

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