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Expression of aT4g27260/GH3-5/GH3a studied with in situ hybridization

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Tropisms, the responses of plants to external stimuli, have been studied as important evolutionary adaptations and as possible areas of future advantageous genetic manipulation. The goal of our current research is to identify targets of NPH4/ARF7 activity in the elongating hypocotyl cells of tropically-stimulated seedlings. The finding that NPH4/ARF7 is necessary for establishment of phototropic and gravitropic curvature lends credence to the long-held notion that a tropic curve requires formation and response to localized changes in auxin concentration. As a result of previous microarray experiments, we have isolated a suite of eight targets that are potentially under the control of NPH4/ARF7, and therefore acting in response to an auxin gradient. One of the targets is a member of the GH3 family, At4g27260/GH3-5/GH3a. Many of the GH3 family members have been shown to be responsive to, or to be regulated by, auxin. In order to elucidate the expression of At4g27260/GH3-5/GH3a in tropically-stimulated Brassica seedlings, in situ hybridization with sense and antisense RNA probes is being performed. These experiments are meant to clarify where At4g27260/GH3-5/GH3a is expressed in the stem in response to tropic stimulation. These experiments will provide critical insight into how At4g27260/GH3-5/GH3a is regulated under physiological conditions and suggest future experiments to test the functional significance of the encoded protein in the establishment of tropic curves.