Cover Stories:

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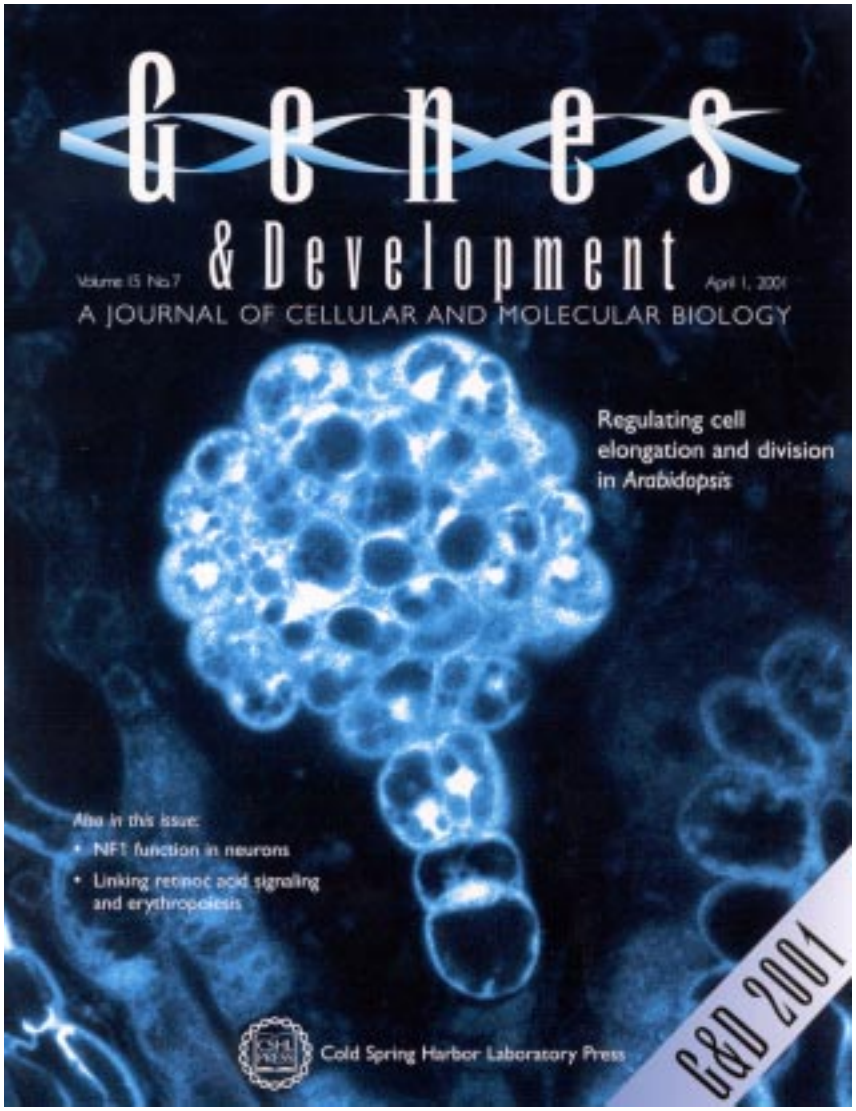
Chen, J.-G., H. Ullah, J.C. Young, M.R. Sussman, and A.M. Jones. 2001. ABP1 is required for organized cell elongation and division in Arabidopsis *embryogenesis.* ***Genes & Development*** *15(7):902-911.*



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The plant growth hormone, auxin, was discovered 60 years ago. Several synthetic forms of this hormone have become extremely important in agriculture, yet little is known about how these or the natural forms of the hormone work. Since this hormone is critical for plant growth and development, understanding its mode of action is important for agriculture. Studies with cells and with the genetic model plant, *Arabidopsis*, have revealed that the action of auxin is concentration dependent. At low concentrations in the cell, auxin causes cell expansion, while at higher concentrations, cell division is stimulated. This suggests that there are at least two receptors that recognize auxin and their binding to auxin evokes different cellular responses. One candidate receptor called auxin-binding protein 1 (ABP1), discovered a decade ago in NRI-funded research, shows promise to be the auxin receptor that controls cell elongation. Jin-Gui Chen, Hemayet Ullah, Jeff Young, Micheal Sussman and Alan Jones have taken a genetic approach to address the importance and role of ABP1. First, they "knocked-out" the ABP1 gene in *Arabidopsis* and found that this mutant plant died at a very early stage indicating that ABP1 is essential for normal plant development. Mutant embryo cells were able to divide but unable to expand. Since both cell division and expansion are needed to bring about plant form, these embryos failed to develop properly. The results also suggested that ABP1 could be the auxin receptor that controls cell expansion. Chen and coworkers tested this further in cells grown in culture by eliminating ABP1 and characterizing the cell's growth characteristics. Consistent with the findings using *Arabidopsis,* they found that cells lacking ABP1 were able to divide but could not expand. These findings contribute to our fundamental understanding of how plants grow and develop and set the stage for enhancing crop performance.

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