Auxin promotion of seedling growth in *Arabidopsis* via ARF5 is dependent on the brassinosteroid-regulated transcription factors BES1 and BEH4

The title should clearly indicate the subject and purpose of the material presented

Anahit Galstyan and Jennifer L. Nemhauser

An abstract is a condensed but complete summary of the work presented. Avoid phrases like 'will be discussed.' Identify plants or other organisms involved and pertinent details needed to interpret the results. Do not use or cite figures, tables, or references. Limit the abstract itself to **2,000 characters** (or **300 words**).

Rationale

Seedlings must continually calibrate their growth in response to the environment. Auxin and brassinosteroids (BRs) are plant hormones that work together to control growth responses during photomorphogenesis.

Why was this work done?

Objectives Methods

We used our previous analysis of promoter architecture in an auxin and BR target gene to guide our investigation into the broader molecular bases and biological relevance of transcriptional co-regulation by these hormones.

What are the goals of this research? How were they achieved?

Results

We found that the auxin-regulated transcription factor Auxin Responsive Factor 5 (ARF5) and the brassinosteroid-regulated transcription factor BRI1-EMS-Suppressor 1/Brassinazole Resistant 2 (BES1) co-regulated a subset of growth-promoting genes via conserved bipartite cis-regulatory elements. Moreover, ARF5 binding to DNA could be enriched by increasing BES1 levels. The evolutionary loss of bipartite elements in promoters results in loss of hormone responsiveness. We also identified another member of the BES1/BZR1 family called BEH4 that acts partially redundantly with BES1 to regulate seedling growth. Double mutant analysis showed that BEH4 and not BZR1 were required alongside BES1 for normal auxin response during early seedling development.

What did the research find?

Conclusions

We propose that an ARF5-BES1/BEH4 transcriptional module acts to promote growth via modulation of a diverse set of growth-associated genes.

New knowledge or insight gained that makes your study useful