

## **Constitutive auxin response in *Physcomitrella* reveals complex interactions between Aux/IAA and ARF proteins**

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The coordinated action of the auxin-sensitive Aux/IAA transcriptional repressors and ARF transcription factors produces complex gene-regulatory networks in plants. Despite their importance, our knowledge of these two protein families is largely based on analysis of stabilized forms of the Aux/IAs, and studies of a subgroup of ARFs that function as transcriptional activators. To understand how auxin regulates gene expression we generated a *Physcomitrella patens* line that completely lacks Aux/IAs. Loss of the repressors causes massive changes in transcription with misregulation of over a third of the annotated genes. Further, we find that the *aux/iaa* mutant is blind to auxin indicating that auxin regulation of transcription occurs exclusively through Aux/IAA function. We used the *aux/iaa* mutant as a simplified platform for studies of ARF function and demonstrate that repressing ARFs regulate auxin-induced genes and fine-tune their expression. Further the repressing ARFs coordinate gene induction jointly with activating ARFs and the Aux/IAs.