

Root hair development have been show to regulated by plant hormones auxin and ethylene. However, the independent role of either hormones understanding is difficult as auxin-ethylene shows crosstalk. To dissect their respective role, effects of two compounds, chromosaponin I (CSI) and 1-naphthoxyacetic acid (1-NOA), on the root hair developmental process was investigated in wild-type Arabidopsis, ethylene-insensitive mutant *ein2-1*, and auxin influx mutants *aux1-7*, *aux1-22*, and double mutant *aux1-7 ein2*. β -Glucuronidase (GUS) expression analysis in the BA-GUS transgenic line consisting of auxin-responsive domains of *PS-IAA4/5* promoter and GUS reporter reveal that 1-NOA and CSI acted as auxin uptake inhibitors in Arabidopsis roots. The frequency of root hairs in *ein2-1* roots were greatly reduced in the presence of CSI or 1-NOA, suggesting that endogenous auxin played a critical role for root hair initiation in the absence of an ethylene response. All of these mutants showed a reduction in root hair length, however, the root hair length could be restore with a variable concentration of 1-naphthaleneacetic acid (NAA). NAA (10 nM) restores the root hair length of *aux1* mutants to wild-type level, whereas 100 nM NAA was needed for *ein2-1* and *aux1-7 ein2* mutants. These results suggest that auxin-driven root hair elongation is affected by insensitivity in ethylene response. CSI exhibited a similar effect to 1-NOA, reducing root hair growth and the number of root hair-bearing cells in wild-type and *ein2-1* roots, while stimulating these traits in *aux1-7* and *aux1-7 ein2* roots, confirming that CSI is a unique modulator of AUX1.