

# SHORT-ROOT and SCARECROW Promote Root Stem Cell Activity by Suppressing Stress Signaling

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## Introduction

- ❖ Unlike animals, plants maintain two populations of stem cells after embryogenesis – one at the shoot tip, the other at the root tip – and continuous activity of these stem cells contributes to the indeterminate growth of plants
- ❖ Stem cell activity is inhibited by stress. Plants are immotile and, to survive an ever-changing environment, they must keep a balance between growth and stress responses
- ❖ SCARECROW (SCR) and SHORT-ROOT (SHR) are important regulators of stem cell renewal in root, but how they maintain stem cell activity is unknown

## Results

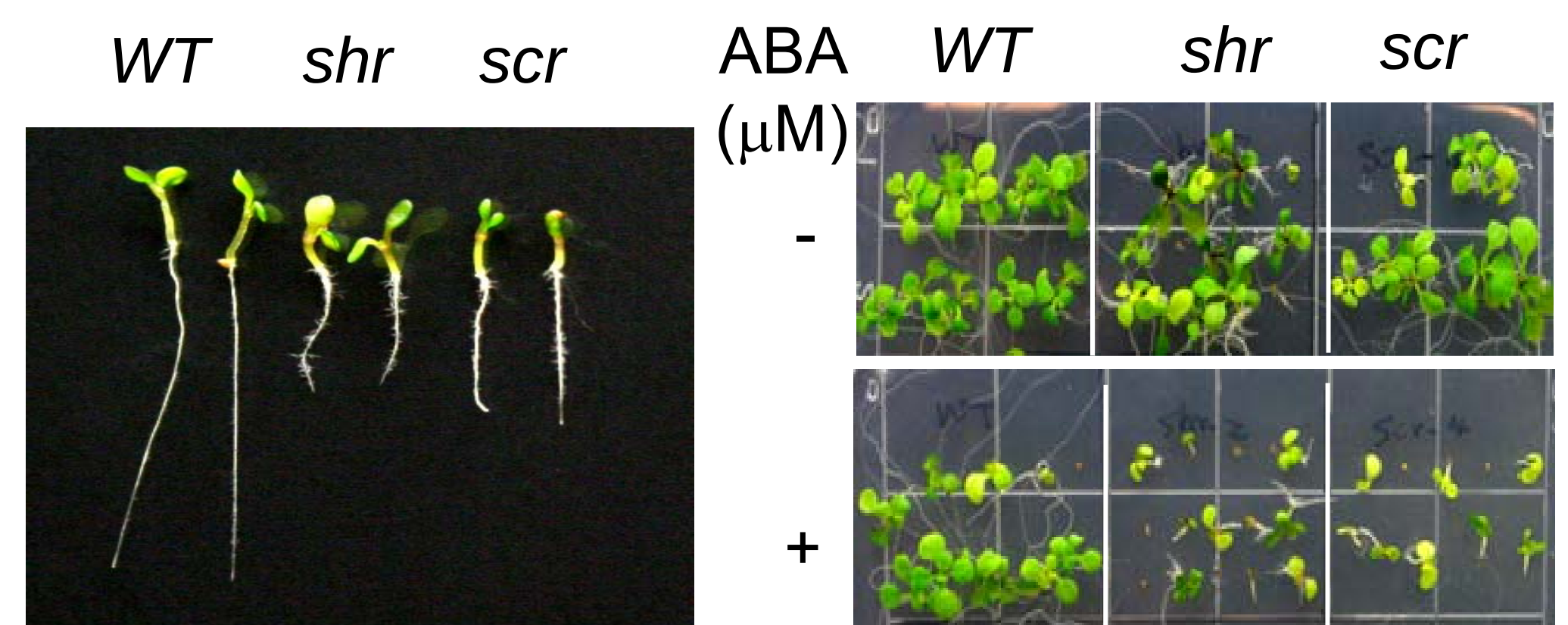
- ❖ We found that SCR and SHR repress stress response, and the short-root defects of *scr* and *shr* mutants were alleviated by mutations in genes that are involved in stress response and signaling

## Future directions

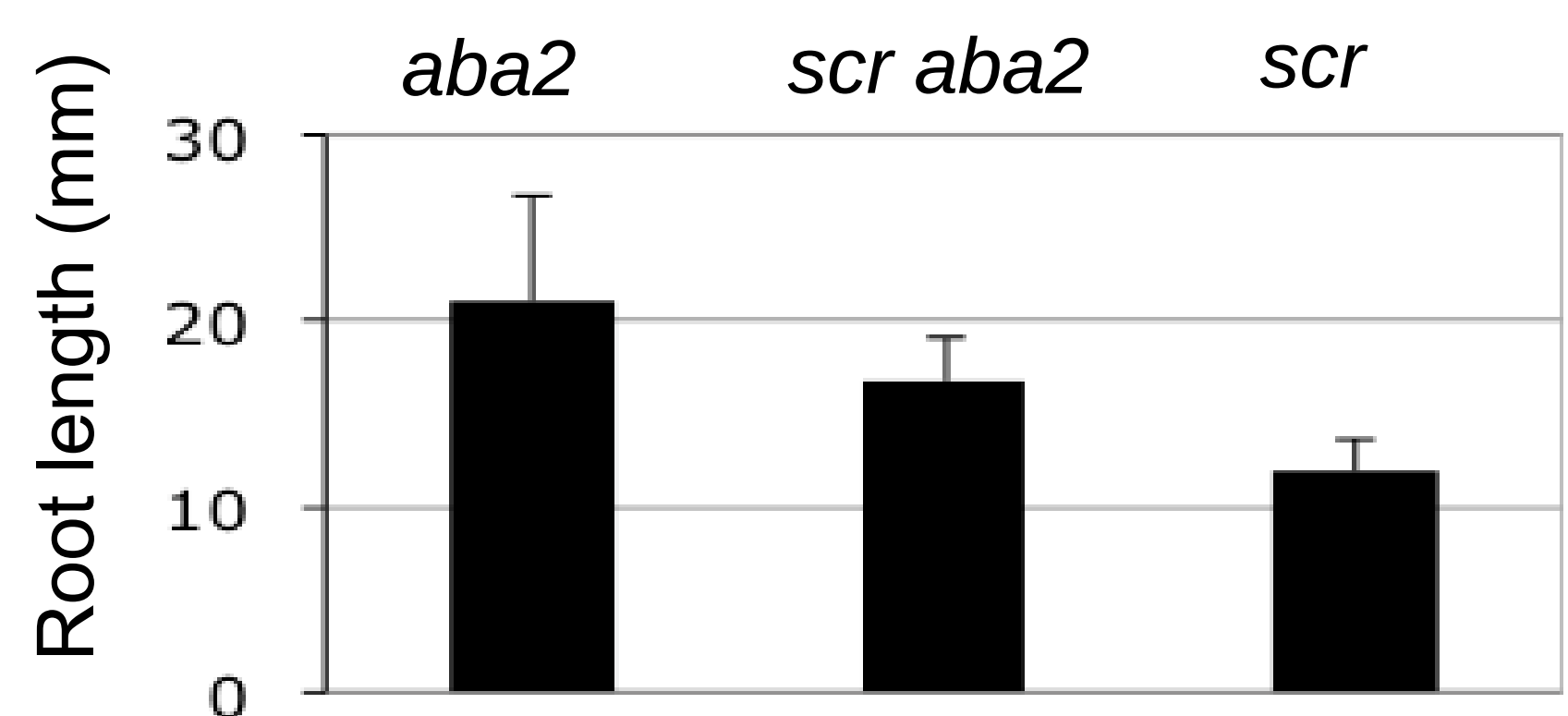
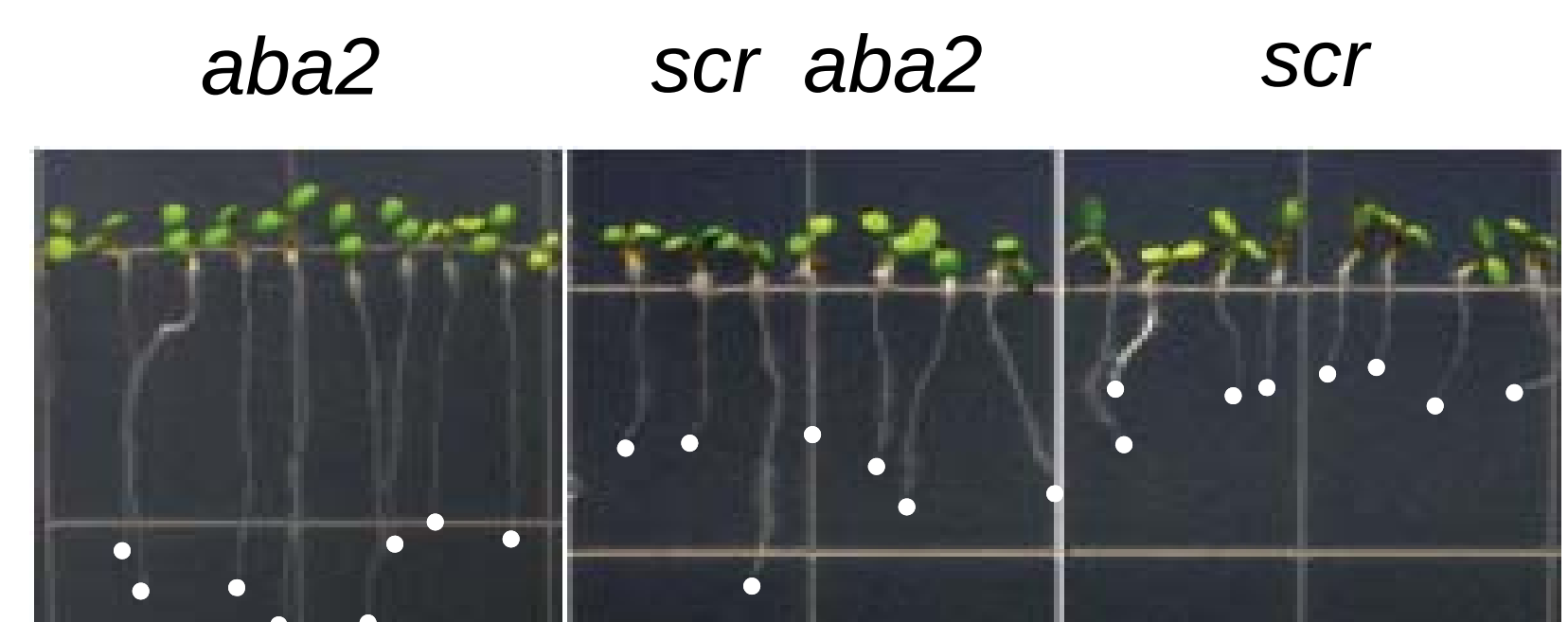
- ❖ To elucidate the molecular mechanism by which SCR promotes root stem cell activity under stresses
- ❖ To identify additional factors that coordinate root growth and stress responses

## Observations

- SCR and SHR are essential for root growth



- *shr* and *scr* mutants are hypersensitive to ABA, a stress-associated plant hormone
- The ABA-insensitive *aba2* mutant alleviates the short root defects of *shr* and *scr*



- The *scr aba2* and *shr aba2* mutants have a greater number of stem cells

