Supporting Information

Koizumi et al. 10.1073/pnas.1205579109

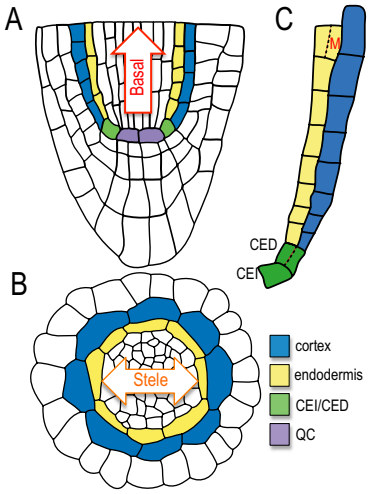

Fig. S1. Organization of the *Arabidopsis* root meristem. Color-coded diagrams of (*A*) longitudinal and (*B*) transverse cross-sections through the root meristem. Away from the quiescent center (QC) toward the shoot is basal, whereas toward the root tip (apex) is apical. (*C*) Cortex and endodermis are clonally related tissues derived from the cortical endodermal initial (CEI), which produces the cortical endodermal daughter (CED) cell. Asymmetric divisions of the CED (dotted line) produces the separate cortex and endodermis in a wild-type root. Asymmetric division of the endodermis (dotted line) produces the middle cortex (MC) (labeled "M" in *C*). Throughout the paper, all roots are oriented as in *A* with the root apex pointing downward.

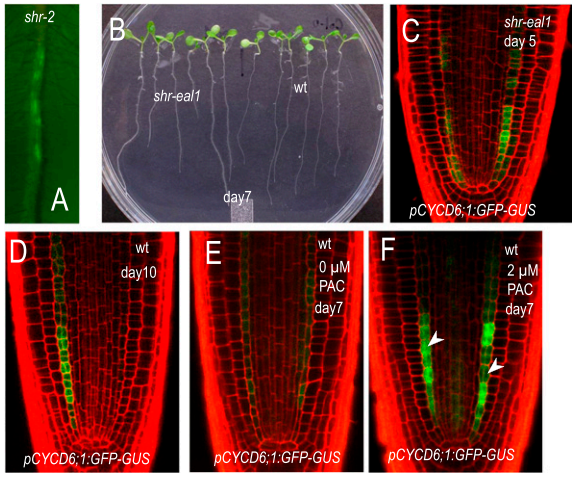

Fig. S2. Expression of *pCYCD6;1:GFP-GUS* under various conditions. (*A*) *pCYCD6;1:GFP-GUS* is expressed in the lateral root primorida of the *shr-2* mutant roots. (*B*) *shr-eal1* seedlings are marginally larger than wild type and (*C*) show early expression of *pCYCD6;1:GFP-GUS*. (*D–F*) Expression of *pCYCD6;1:GFP-GUS* in untreated 10-d-old wild-type as well as 7-d-old treated and untreated (as indicated) roots corresponds with periclinal cell divisions in the endodermis. (*F*) Real-time PCR on 5-d-old whole roots treated for 6 h with paclobutrazol (PAC).

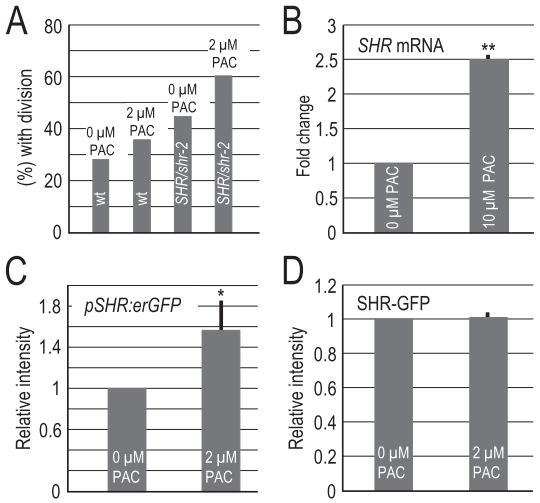

Fig. S3. Effects of PAC treatment on MC formation and SHR expression. (*A*) Treatment of wild type or *shr-2* heterozygotes results in an increase in the percentage of day 7 roots forming MC. (*B*) Six-hour treatment of 5-d-old roots with PAC resulted in a 2.5-fold increase in the whole root expression of *SHR* mRNA (as measured by real time PCR) and (*C*) a 1.5-fold increase in pSHR:erGFP levels in the root meristem, which (*D*) the increase in mRNA did not translate into an increase in the amount of SHR-GFP protein as indicated by similar levels of SHR-GFP in the stele of untreated and PAC-treated roots. $*P < .05$; $**P < .01$ (*t* test).

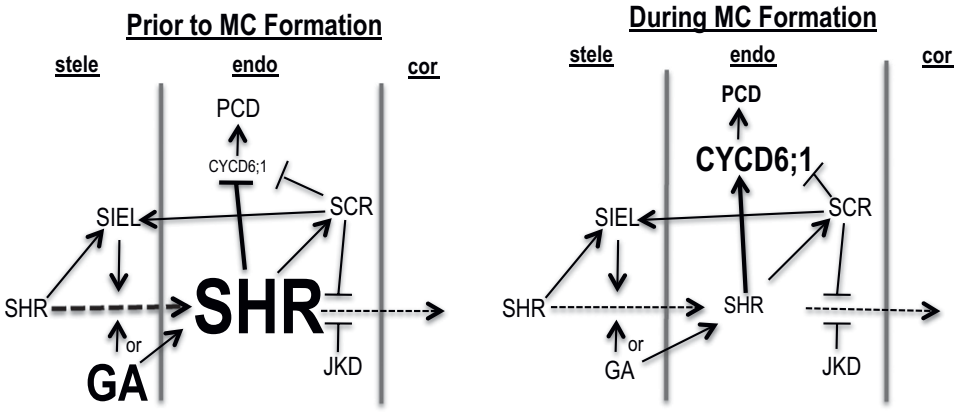

Fig. S4. Integrated model for SHR function in the formation of MC. Before the formation of the MC, SHR is maintained at high levels in the endodermis due to positive feedback loops that promote SHR movement and trapping in the nuclei of endodermal cells. During the formation of MC, SHR levels in the endodermis decrease. This decrease allows expression of CYCD6;1 and periclinal cell divisions (PCD) to occur. Dashed arrows indicate movement. All other arrows indicate function. endo, endodermis; cor, cortex. Size of the type indicates relative activities. GA is shown in the stele; however, it could also be acting directly in the endodermis on SHR turnover.