



IIT ROORKEE



NPTEL ONLINE
CERTIFICATION COURSE

Root Development (Vascular Development)

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Vascular Development

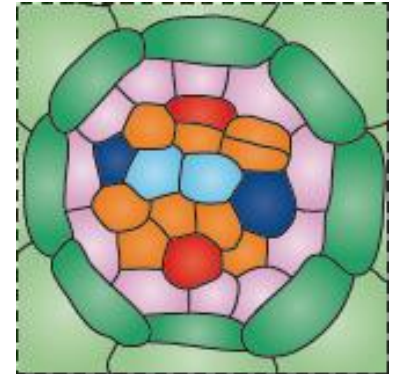
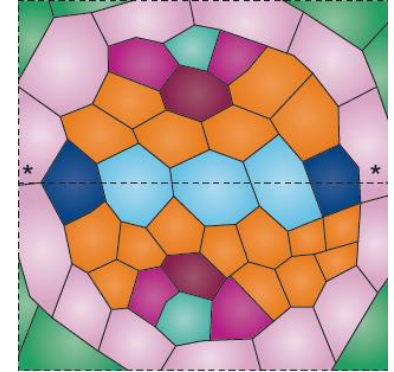
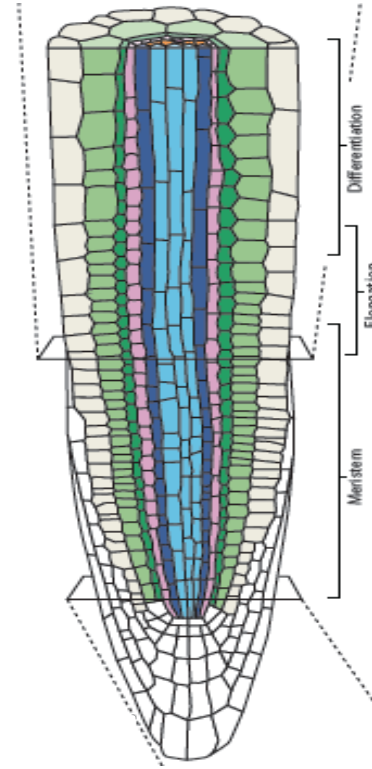
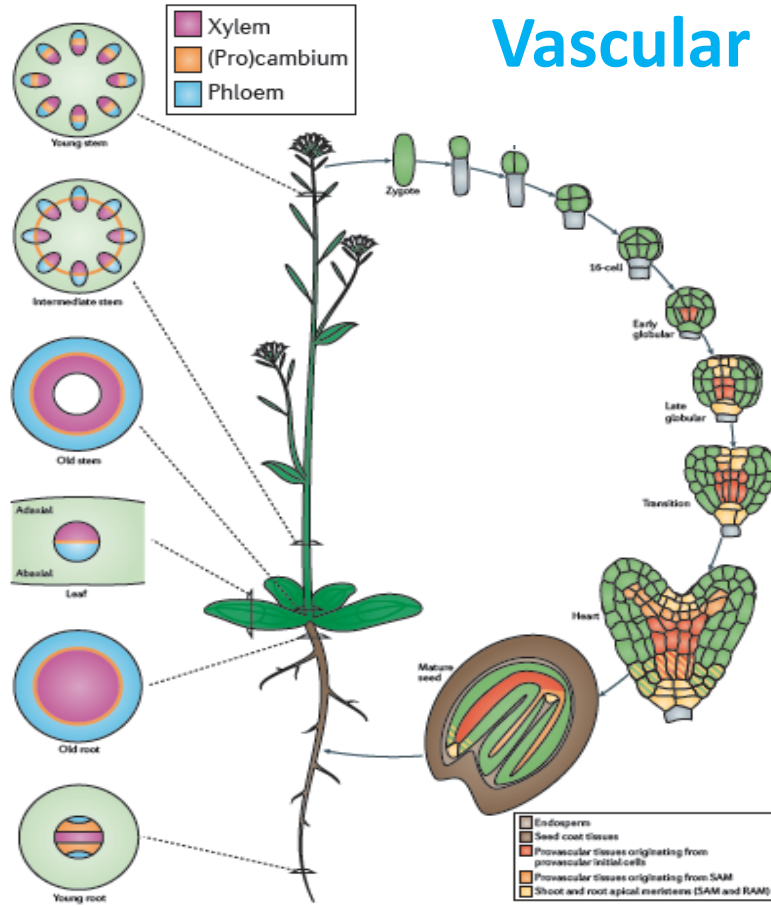


Image Source: De Rybel et al. (2016), Nat Rev Mol Cell Biol., 17, 30-40.

Specification of Vascular (Pro)cambium

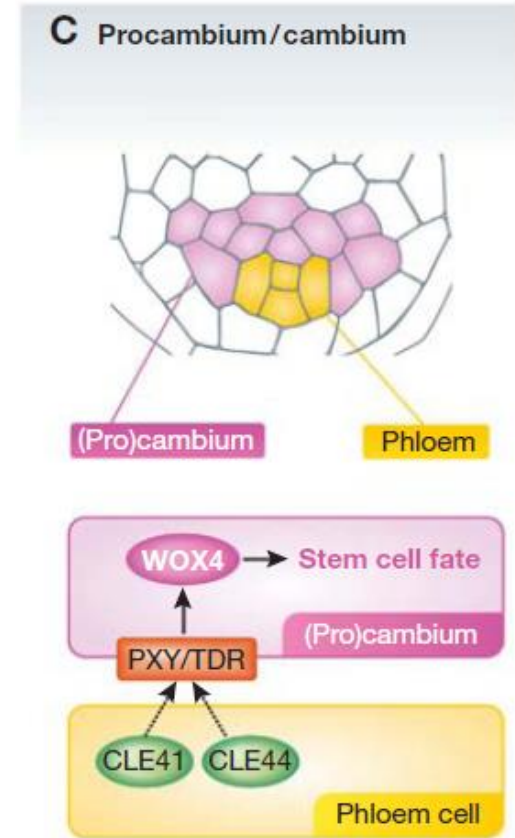
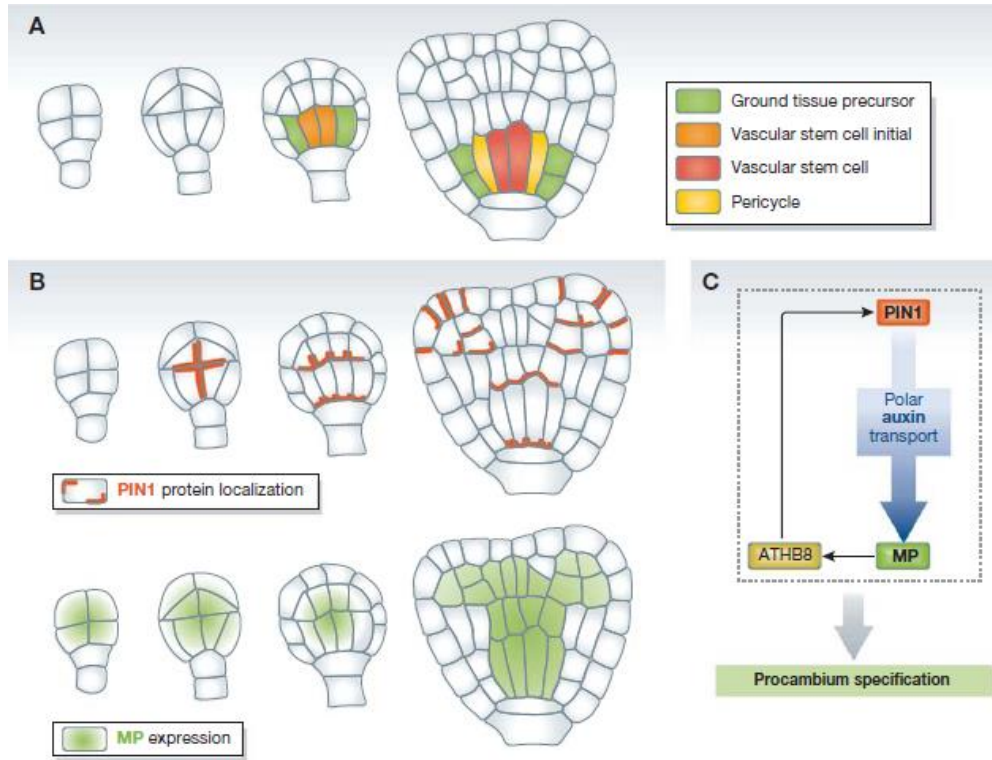


Image Source: Miyashima et al. (2013), EMBO Journal , 32, 178–93.

Vascular Patterning

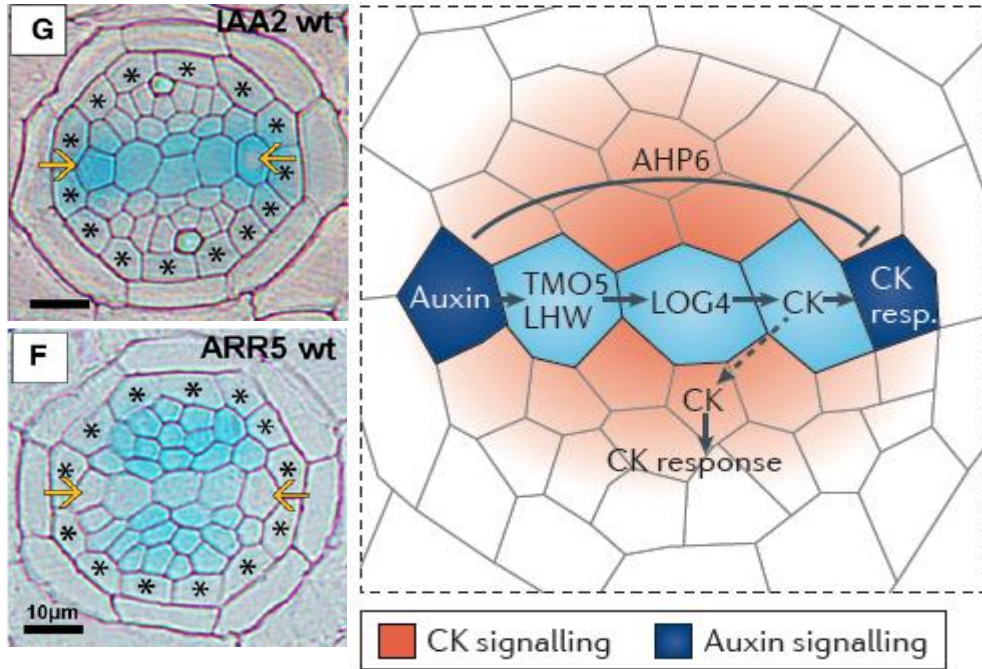
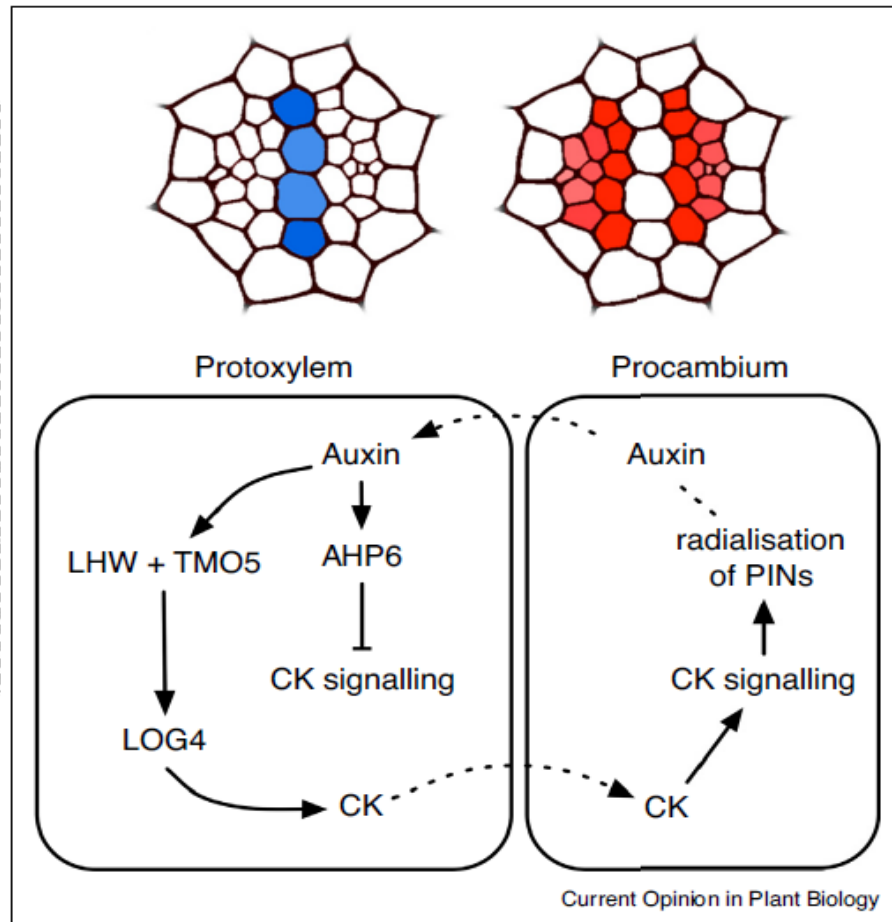


Image Source: Bishopp et al. (2011), *Curr Biol.*, 21, 917-26.
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Xylem Development

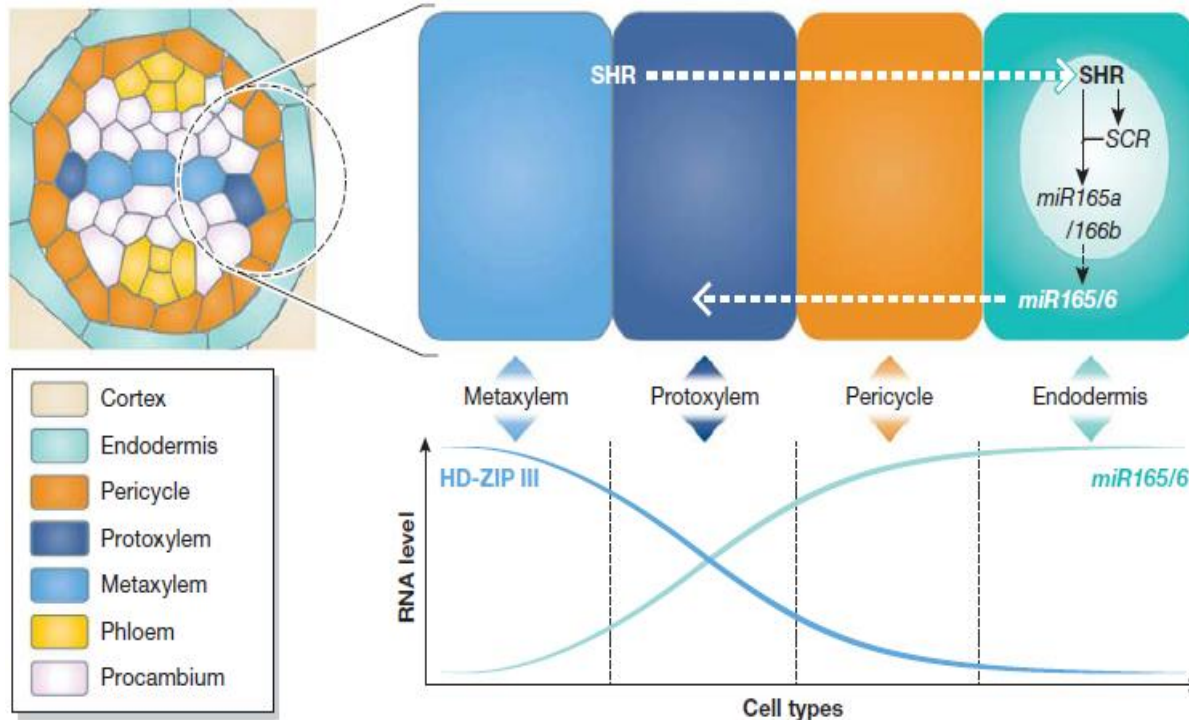
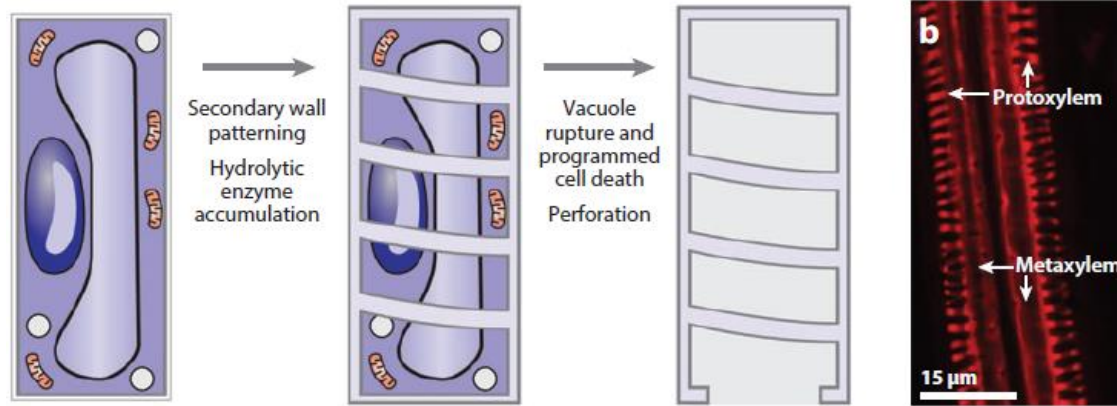


Image Source: Miyashima et al. (2013), EMBO Journal , 32, 178–93.

Xylem Development



Xylem differentiation network

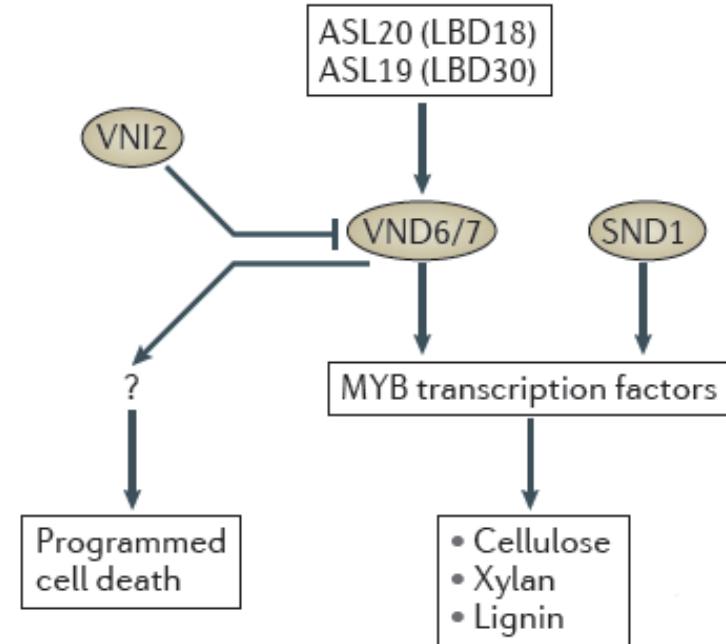


Image Source:

Miyashima Furuta, Hellmann et al. (2014) *Annu Rev Plant Biol.*, 65, 607-38.

De Rybel et al. (2016), *Nat Rev Mol Cell Biol.*, 17, 30-40.

Phloem Development

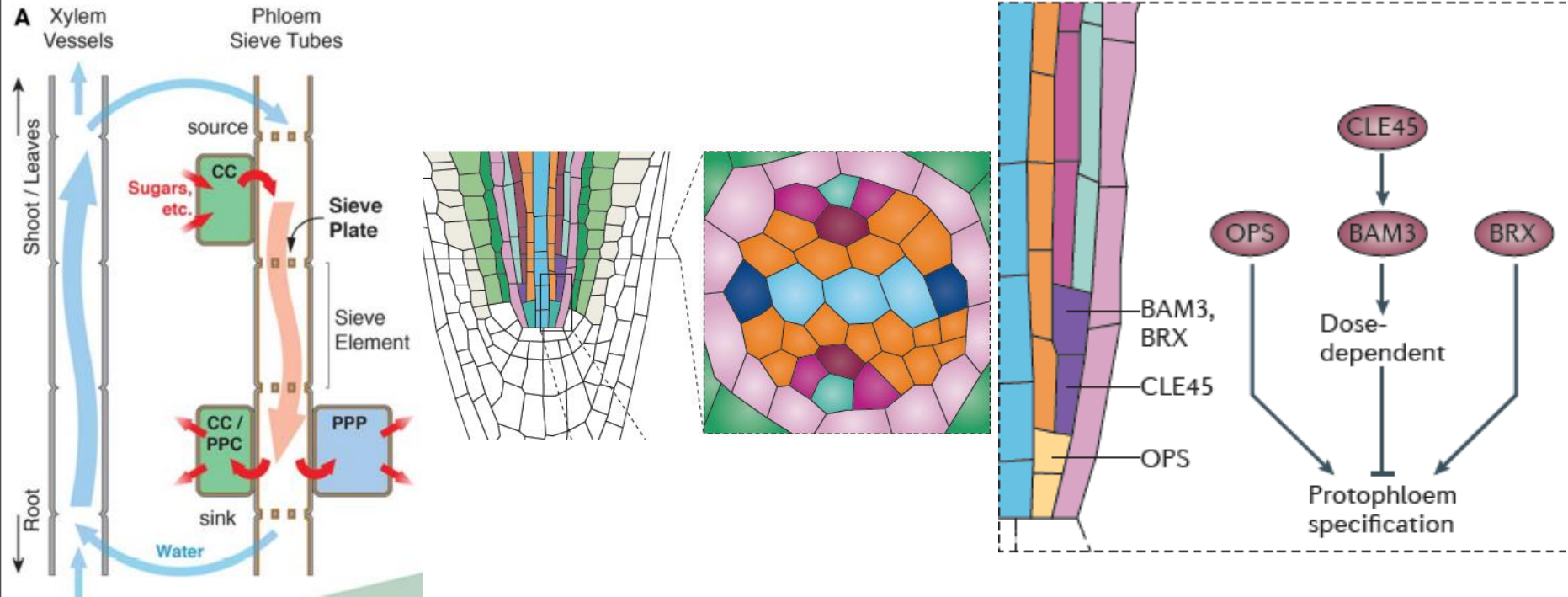


Image Source: Kalmbach & Helariutta (2019), *Plants*, 8, 25.
De Rybel et al. (2016), *Nat Rev Mol Cell Biol.*, 17, 30-40.

Phloem Development

APL regulates vascular tissue identity in *Arabidopsis*

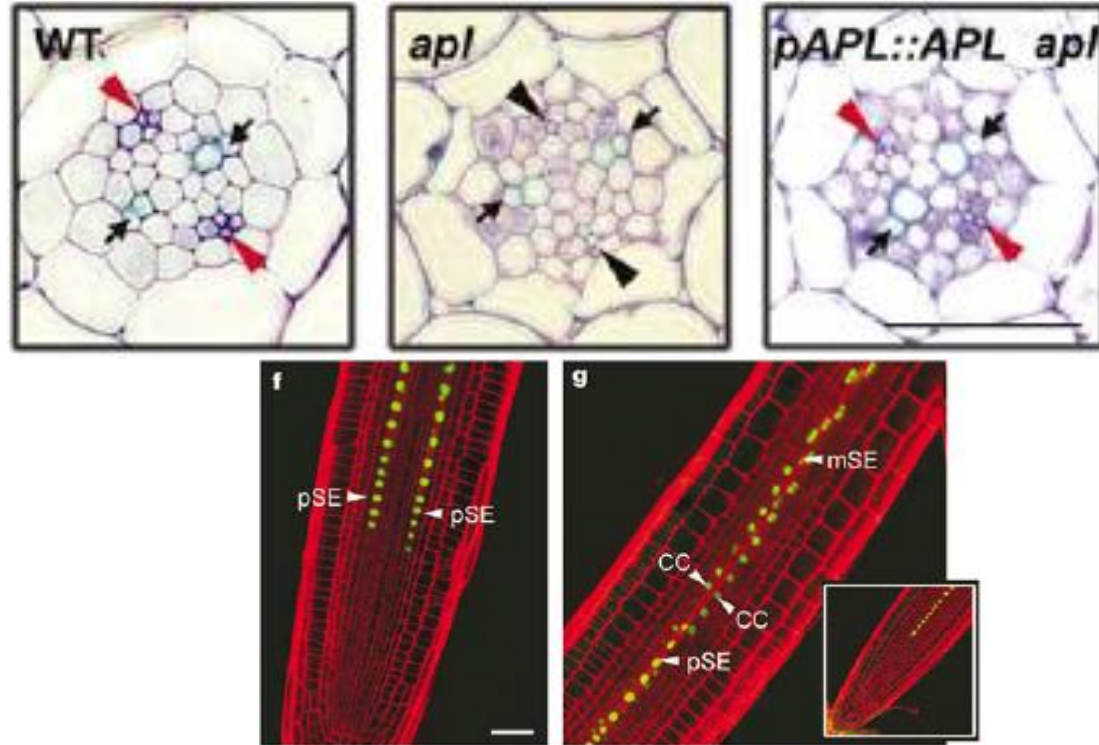
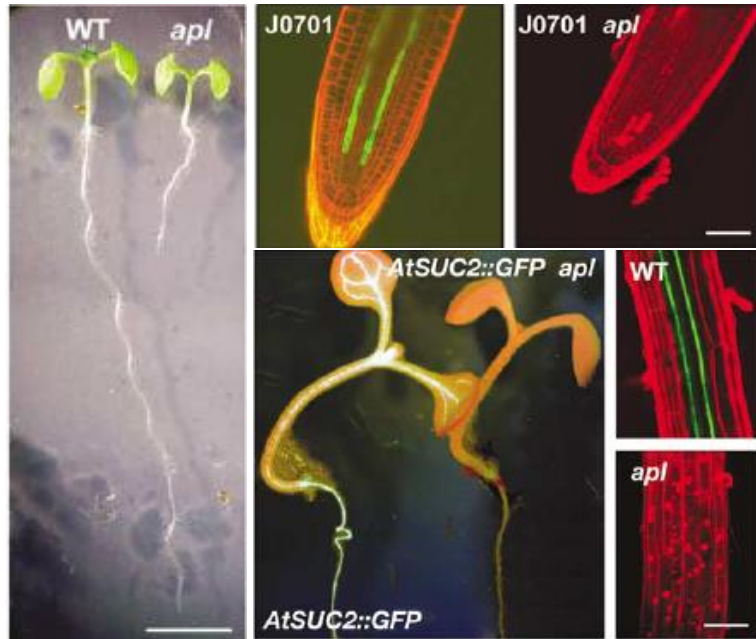


Image Source: Bonke et al. (2003), Nature, 426, 181-86.

Phloem SE Development

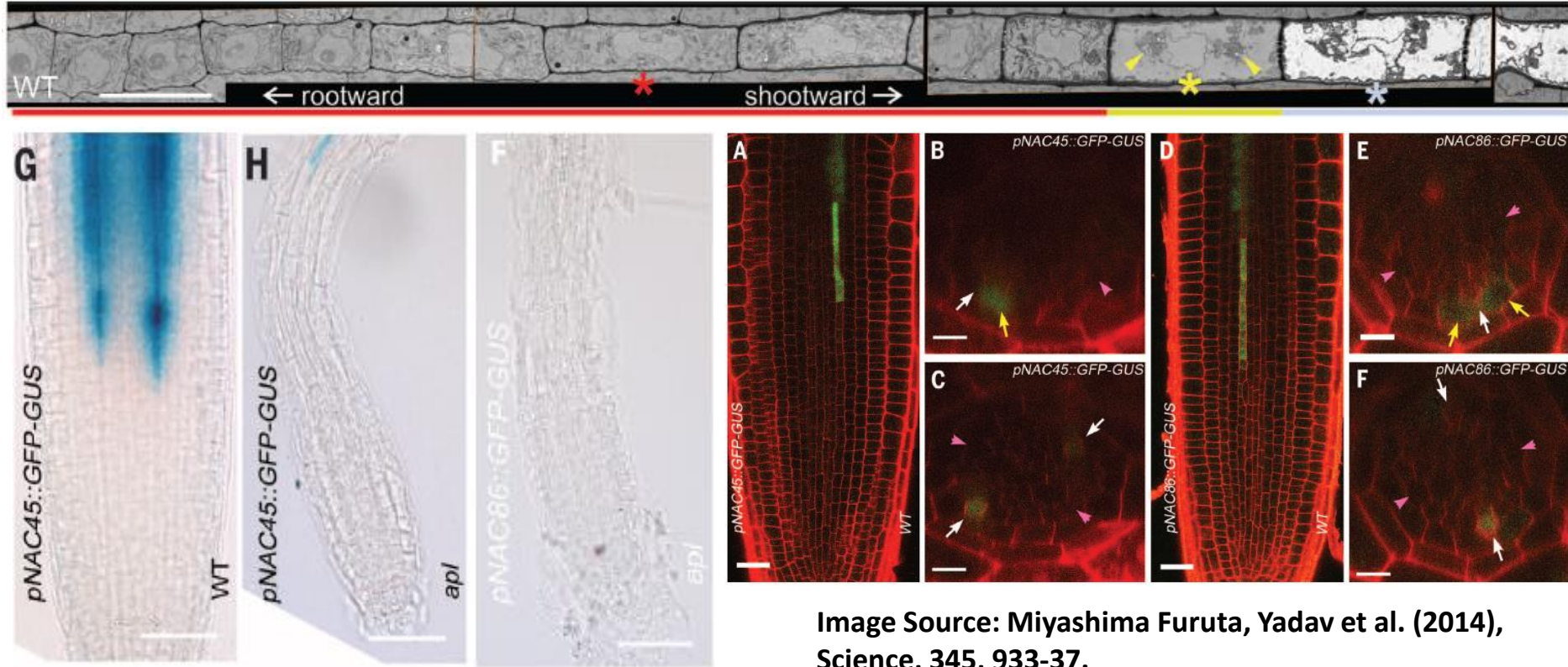


Image Source: Miyashima Furuta, Yadav et al. (2014),
Science, 345, 933-37.

Phloem SE Development

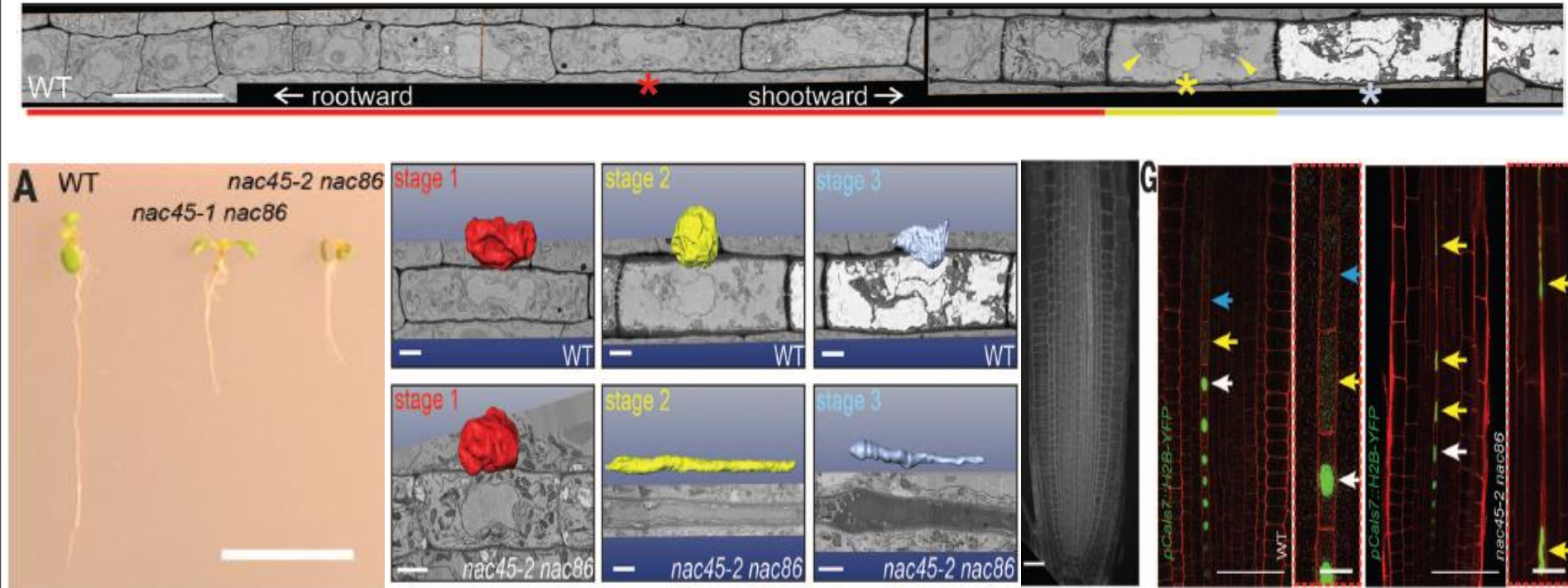


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Phloem SE Development

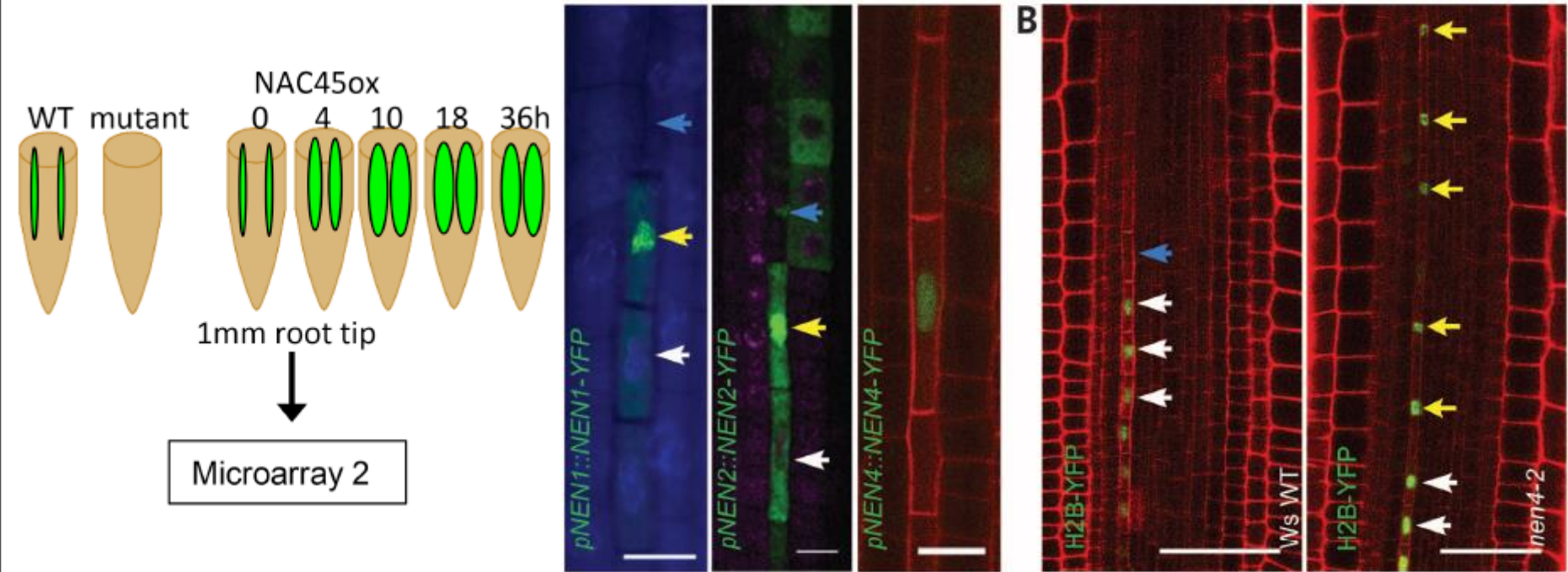


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Phloem SE Development

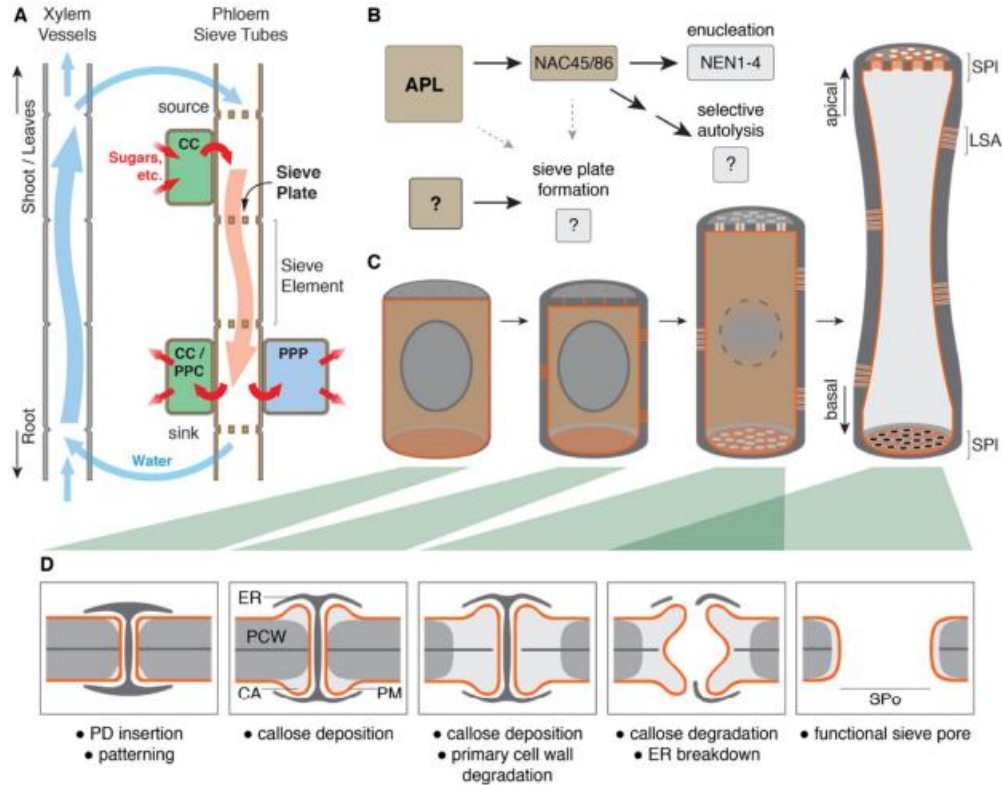


Image Source: Kalmbach & Helariutta (2019),
Plants, 8, 25.

Regulation of Vascular Development

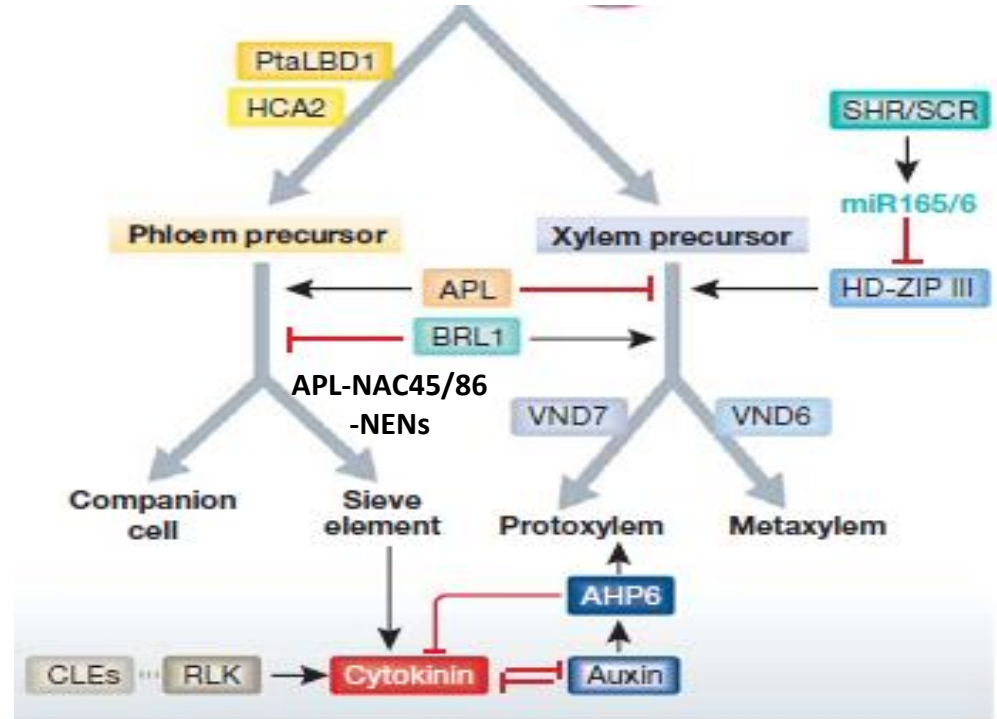
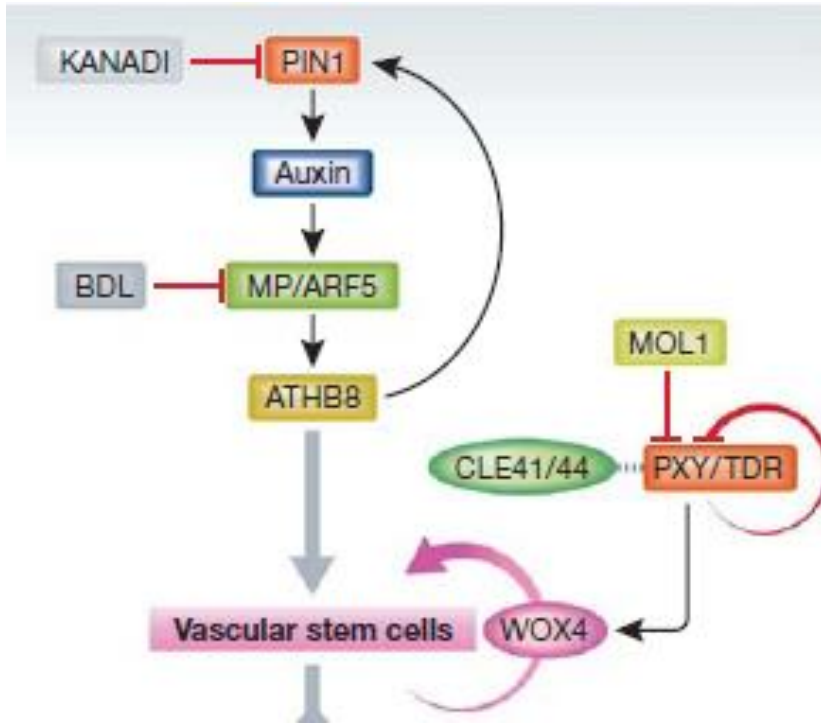


Image Source: Miyashima et al. (2013), EMBO Journal , 32, 178–93.