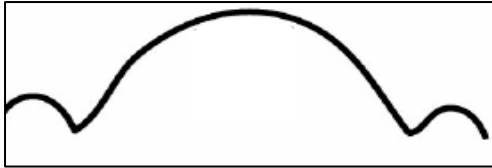
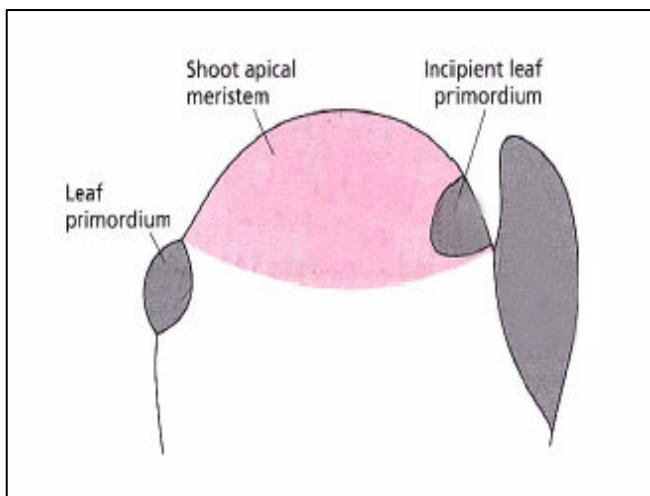


1. Define stem cells
2. Give example of stem cells in animals
3. What genes regulate stem cells in the shoot apical meristem?(describe function and expression domain based on genetic evidence)
4. In the scheme below, draw the stem cells regulatory network in the shoot apical meristem



Scheme. 1

5. In the scheme below define the genes involved in shoot apical meristem maintenance and primordium initiation

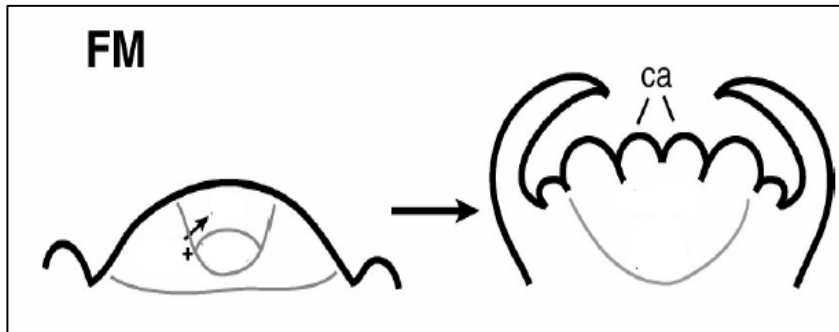


Scheme.2

6. Describe the regulation between PIN1, CUCs and STM regarding shoot formation and organ separation
7. How is polarity is establish in leaves and which mechanism regulates genes involved in this process
8. a. What is phyllotaxis?
b. Define the inhibitory field theory

9. What determine the position of a primordium in the shoot meristem
10. What is the difference between shoot and flower meristem
11. What genes are involved in flower organ specification?
12. In the floral meristem WUS gene interacts with flowering genes to promote flower development and at later stages (once the carpel is formed) WUS is repressed.

Illustrate these interactions in the scheme below



Scheme. 3

13. Describe the interactions between TFL, LFY in the shoot and flower meristem
14. a. In the root meristem what cells are required to maintain stem cells in their undifferentiated state?
 - b. Laser ablations of the organizer cells in the root meristem led to?
15. Which pathways define the stem cell niche in the root meristem?
16. Which genes promote stem cell identity in the root meristem
17. By which mechanism is auxin transported in plants?
18. Describe the regulatory network between PLT and PIN genes in the root meristem.
19. Give an example of moving transcription factors in the root meristem
20. Describe the effect of Rb (Retinoblastoma like) on root meristem maintenance