**Cell Wall Quiz**

**Wall Chemistry Matching:** Match each of the following with the appropriate chemical (unless otherwise indicated, there is one response for each)

- a. cellulose
e. pectic polysaccharides
- c. hemicellulose
g. suberin
- b. cutin
d. lignin
- f. protein

1. ____ also called cross-linking glycans
2. ____ β 1,4-glucan
3. ____ calcium bridges link these
4. ____ carbohydrates (3 responses)
5. ____ common components in primary walls (4 responses)
6. ____ dissolved from the wall with strong alkali
7. ____ especially rich in wood
8. ____ expansin is an example
9. ____ extract from wall with dilute acid or hot water
10. ____ hydrophobic molecules (2 responses)
11. ____ made in the golgi apparatus (2 responses)
12. ____ made of phenylpropanoids
13. ____ main constituent of the middle lamella
14. ____ molecules form hydrogen bonds to make microfibrils
15. ____ orientation in the wall determined by microtubules
16. ____ polymer rich in galacturonic acid (homogalacturonic acid)
17. ____ polysaccharides that don’t self aggregate (2 responses)
18. ____ primary strengthening agent in secondary wall
19. ____ proline, hydroxyproline and glycine are components
20. ____ rhamnogalacturonans
21. ____ rich in xyloglucans and glucoronarabinoxylans
22. ____ synthesized by rosettes in the membrane
23. ____ used in making gels
24. ____ waterproofing embedded in the wall
25. ____ waterproofing on the outside of the wall

26. Assume you are going to hammer a miniature nail through the cell wall. Which of the following would you hit as you move from outside (#1) to inside (5)?
   - ____ secondary wall (S2)
   - ____ secondary wall (S1)
   - ____ middle lamella
   - ____ primary wall

27. Assume the cell is making a protein to be inserted in the wall. Follow its progress through the endomembrane system by arranging the following in order from start (site of protein production to wall (#9)).
   - ____ cell membrane
   - ____ golgi – cis
   - ____ golgi – trans
   - ____ RER
   - ____ ribosome
   - ____ SER
   - ____ vesicle
   - ____ vesicle
   - ____ wall
28. What is the function of water in the wall?

29. Explain why every other glucose residue in a cellulose chain is upside-down.

30. Electron micrographs of the cell membrane show clusters of proteins that look like a flower (rosettes). What are these rosettes and what is their function?

31. Explain why secondary walls are not able to expand.

32. Explain why the walls of mature cells lose their ability to grow.

33. Compare and contrast plant and animal cells methods for controlling size and shape.

34. To expand, walls must be loosened (relaxed). What does this mean?

35. Explain why the terms “hydrogen ion” and “proton” are synonyms.

36. Describe two ways in which protons loosen walls.

37. What is the mechanism by which the wall becomes loosened?

38. Auxin, a plant hormone, has been shown to stimulate cell elongation. Describe two modes of action for auxin.

**Fill-in-the-Blanks:**

39. ___________ Name the enzyme that makes cellulose
40. ___________ Stage of cell cycle during which walls are synthesized
41. ___________ Vesicles and spindle microtubules along the cell equator
42. ___________ A drug that disrupts microtubule formation
43. ___________ The driving force for cell expansion