**STUDY GUIDE CYTOSKELETON AND CELL MOTILITY**

**VOCABULARY**

Structures/structural components:

Microtubule Microfilament Intermediate filament

F-action Tubulin Basal body

G-actin Centriole Axoneme

Cilia Stereocilia Protofilament

Dynein Cytokinesis Microvillus

Terminal web

**OBJECTIVES AND QUESTIONS**

1. You should be able to fill out the table below which compares the major components of the cytoskeleton? (Hint: I filled it in for you this time.)

Microtubules Microfilaments Intermediate filaments

Structure: Hollow tube 2 intertwined Staggered coiled-coil Wall-13 protofilaments chains of F-actin of rod-like proteins Labile or stable types Dynamic Stable!

Monomers: Tubulin (globular) G-Actin (globular) varies with tissue

Functions: Organelle movement Cell locomotion Structural support Chromosome movement Cytokinesis Cell-cell adhesion Directionality

1. What is the difference between stable microtubule structures (basal bodies, axonemes, and centrioles) and labile microtubules (cytoplasmic MTs)? Where are they located? What is the functional difference? What are structural differences? What portion (protein) of the cilia contains the ATPase activity?
2. Name a drug that binds to tubulin monomers? Name a drug that binds to G-Actin monomers? What are the effects of these drugs? 9Hint: the answer is NOT depolymerization; these drugs PREVENT REPOLYMERIZATION of labile MTs and microfilaments respectively). Name a drug that stabilized cytoplasmic MTs. Would a cell be able to divide if you applied colchicine to a cell between anaphase and telophase?
3. What are the 5 classes of intermediate filaments described in lecture? What is the distribution of each? What would happen to a person that had a genetic defect of keratin assembly? (Hint: the disease is called epidermolysis bullosa simplex and a loofah would be a bad birthday present! What is a clinical application of immunofluorescence labeling of intermediate filaments?
4. True or false: Polymers of actin can readily dissociate under physiological conditions? What about cytoplasmic microtubules? Basal bodies? Centrioles? MTs in cilia? Intermediate filaments? What is meant by dynamic instability?