Cells to Tissues

Team-Based Learning Session

Website for today's session

medcell.org/tbl/cells_to_tissues

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Readiness Assessment Questions

Q1. During development, ectoderm gives rise to both neural tissue and epithelia. The separation of these two tissues is driven by a change in the expression of which protein?

A. Cadherin

B. Integrin

C. Catenin

D. Connexin

Q2. In some muscle tissue, stimulating contraction in one cell leads to contraction in adjacent cells. Which structure most likely facilitates the spread of a signal to contract between cells?

A. Adhering junctions

B. Desmosomes

C. Integrins

D. Gap junctions

Q3. During repair of tissue damage, cells in the tissue are stimulated to divide to replace those that were lost. Which protein signals cells to stop dividing when the repair process is complete?

A. Integrins

B. Connexin

C. Collagen

D. Cadherin

Q4. After damage to a tissue, fibroblasts crawl through the extracellular matrix to reach the site of damage. Which protein is critical for the motility of fibroblasts?

A. Cadherins

B. Catenins

C. Integrins

D. Connexins

Q5. Mutations in the genes that encode a specific set of integrins lead to skin blistering diseases in which mild abrasion causes the skin cells to separate from the underlying extracellular matrix. A mutation in a gene encoding what other protein would likely produce a similar phenotype?

A. Tubulin

B. Beta-Catenin

C. Actin

D. Keratin (Intermediate Filament)

Application Questions

Disease and infection often damage cells, compromising the structure and function of tissues. Pollutants and pathogens can damage or kill cells in the lung, reducing respiratory capacity. Your project is to repair epithelial tissue in the lung (these are the cells that face the air). Your approach has been to use a patient's stem cells to replace the damaged cells in the airways of their lungs. However, you find that the stem cells don't seem to integrate into patients' lung tissues.

You decide to help the stems insert themselves into lung tissue by genetically engineering the cells to express a specific type of protein involved in cell adhesion. Develop an argument for which protein would be the best choice.

A. Cadherin

B. Connexin

C. Integrin

D. Catenin

Q2. In cancer, metastasis arises when cells leave a localized and confined tumor, enter the blood stream or lymph and develop into a tumor in a different organ or tissue. Your project is to assess the risk in patients that a localized tumor will become metastatic. The project analyzes the gene expression profile of cells from different regions of a localized tumor. Your analysis finds four regions of the tumor that exhibit the changes listed below. Develop an argument to support which region of the tumor is most likely to become metastatic.

A. Region A: change in the amount of cadherin

B. Region B: change in the amount of integrin

C. Region C: change in the type of cadherin

D. Region D: change in the type of integrin