BIOLOGICAL FRAMEWORKS FOR ENGINEERS

Session #12 [µm: Cell Interactions]

General Objectives:

- ✓ Discuss cellular communication in general.
- ✓ Examine cell-cell and cell-ECM interactions and discuss the importance of each connection from a physiologic perspective.

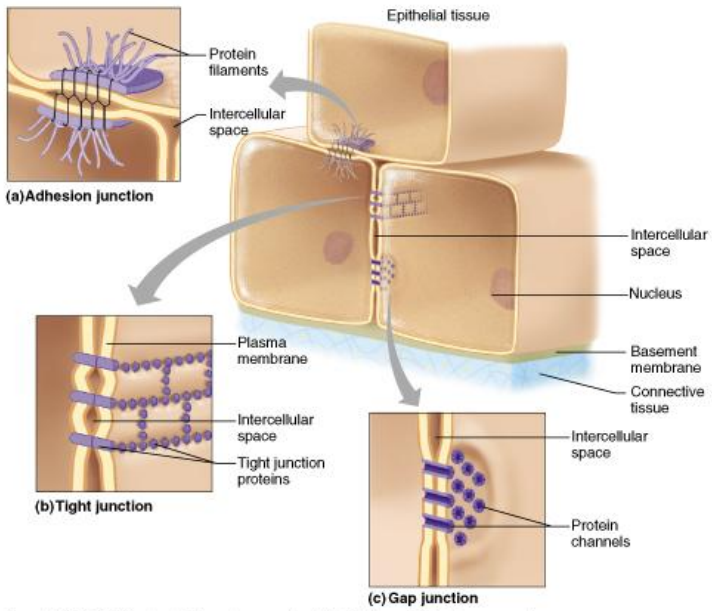
Central Framework:

- ✓ Cell-cell interactions facilitate integrated responses and the passing of information—chemical, mechanical, or electrical.

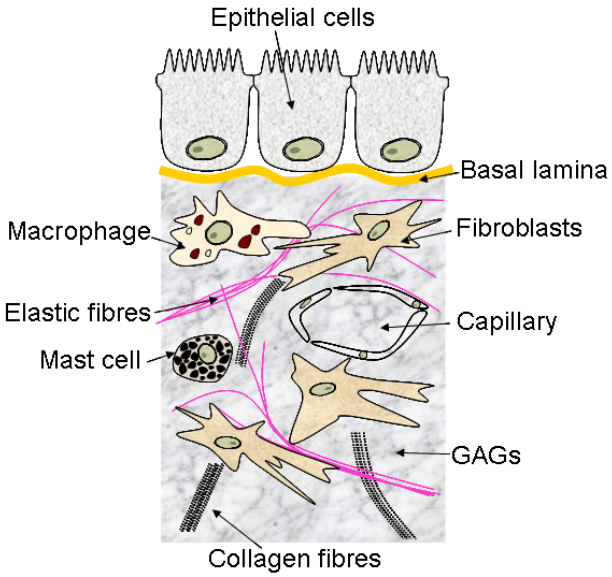
Session Outline:

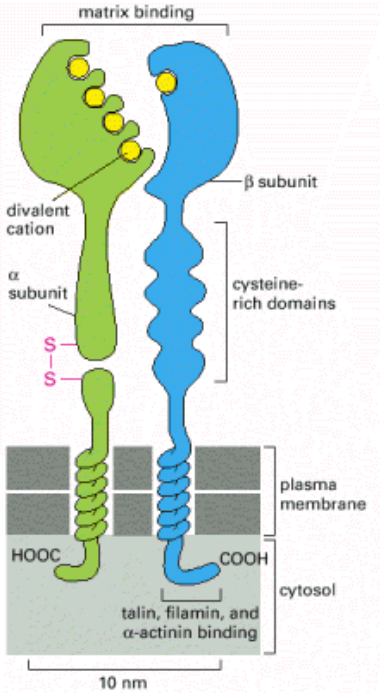
No cell lives in isolation, cell-to-cell, matrix-to-cell, and environment-to-cell communication controls: metabolic processes, growth, differentiation, protein synthesis, protein secretion, and homeostasis.

A. Cell-to-Cell



B- Cell-to-ECM


Epithelial cells
Basal lamina
Macrophage
Fibroblasts
Elastic fibres
Capillary
Mast cell
GAGs
Collagen fibres


matrix binding
β subunit
divalent cation
α subunit
cysteine-rich domains
S
S
plasma membrane
HOOC
COOH
cytosol
talin, filamin, and α-actinin binding
10 nm

C. Receptor Signaling