SUMMARY OF CONNECTIVE TISSUE PROTEINS

A. **Collagen** (derived from Greek "to produce glue")

1. description/distribution
   a. in all multicellular organisms (1/4 of body wt. in mammals)
   b. forms flexible fibers with very high tensile strength--forms the stress-bearing component of body
   c. major fibrous element of skin, bone, tendon/ligament, cartilage, blood vessels, teeth

2. composition
   a. 33% glycine and much more proline than other proteins
   c. contains unusual 4-hydroxyprolines and 5-hydroxylysines
   d. sequence is regular (Gly-Pro-HOPro occurs frequently)
   e. extensive glycosylation (amount and type varies by tissue)

B. **Elastin**

1. description/distribution
   a. rubberlike protein in most connective tissues which occurs in association with collagen and polysaccharides
   b. major component of elastic fibers--large amounts of elastin in the walls of blood vessels, particularly the aorta, in the elastic ligaments, and in the lungs
   c. very little elastin in skin, tendon, loose connective tissues

2. composition
   a. 33% glycine, and very rich in proline
   c. very little hydroxyproline and no hydroxylysine
   d. very few polar amino acids; rich in non-polar aliphatic a.a.

C. **Proteoglycans**

1. description/distribution
   a. polyanions which bind water and cations, and form the extracellular medium of connective tissues
   b. important in enabling the moveable properties of joints and cartilage

2. composition: 95% is repeating polysaccharide chains

D. **Fibronectin**

1. description/distribution: protein which binds reversibly to the outer surface of the plasma membrane of cells, and interacts with collagen and other constituents of the extracellular matrix

2. composition: long protein, 600 A long by 25 A wide, which contains an array of repeating domains which bind specific molecules in the extracellular matrix
E. alpha-Keratin

1. distribution: abundant in hair, nails, and outer epidermal layer

2. composition: contains numerous cysteine residues forming disulfide bonds; has repeating sequence of seven a.a., forms multiply-wound macrofibrils