

UNIVERSITY COLLEGE LONDON

UNIVERSITY OF LONDON

EXAMINATION FOR INTERNAL STUDENTS

FOR THE FOLLOWING QUALIFICATIONS:

B.Sc. (Intercal)

Health Sciences C101: Connective Tissue Biology

COURSE CODE	:	HESCC101
UNIT VALUE	:	0.5
DATE	:	21-MAY-04
TIME	:	14.00
TIME ALLOWED	:	3 Hours

SECTION A

Answer **TWO** questions out of **FIVE** (25 marks for each question)
Answer each question in a **SEPARATE** book

Use diagrams to illustrate your answer where appropriate

1. Discuss the importance of matrix metalloproteinases in the pathology of diseases such as arthritis and cancer.
2. Indicate the ways in which bone becomes calcified. What features, both structural and biomechanical, control calcification?
3. How is the structure of tendon related to functional requirements?
4. Draw the structure of the aggregated molecular complex of aggrecan, hyaluronan and link protein. Discuss the role of each structural component in relation to cartilage function.
5. Discuss the common features of the collagen super family of proteins and the specific characteristics of each sub group (class) of collagen.

SECTION B

Answer **SIX** questions out of **NINE** with short notes (5 marks for each question)

Answer each question starting on a **NEW PAGE** of the answer book

Use diagrams to illustrate your answer where appropriate

1. Define the terms autocrine, paracrine, endocrine and juxtacrine giving an example for each type of signalling.
2. Draw a diagram of an osteoclast indicating the main features of this cell and the mechanisms whereby the osteoclast is able to remove bone.
3. Compare the microscopic characteristics of:
 - a) trabecular bone
 - b) cortical bone
4. Briefly discuss reasons for these differences.
5. What is 'crimp'? Describe its functional role in tendon.
6. Once a cell microfilament has formed, describe the role of three molecular components which need to assemble with it for cell movement.
7. How could you extract proteoglycans from cartilage or tendon tissue *in vitro*? What conditions would you use to ensure a good yield of proteoglycan?
8. Briefly describe the components of an elastic fibre stating which of these is directly involved in the genetic disorder Marfan Syndrome.
9. List three major interactions between regions in a limb bud that operate to control early limb development and state in which axis each of these is important.
10. Compare and contrast cartilage and tendon in terms of their collagen content and arrangement.