LINCOLN
UNIVERSITY COLLEGE
DKU016 (B)

ORAL BIOLOGY PRACTICAL MANUAL 1

(Dental Embryology and Histology)

Name: .....

Matric No: .....

Year: 20.....

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ORAL BIOLOGY PRACTICAL MANUAL 1

(Dental Embryology and Histology)

Objectives

The objectives of this manual are for students to:

1. Understand and describe the microscopic study of tooth development, eruption of teeth and shedding or primary teeth.
2. Understand and describe the microscopic study of tooth enamel, dentine, cementum and pulp tissue.
3. Understand and describe the microscopic study of periodontal ligaments and alveolar bone and their age changes.
4. Draw the microscopic features of tooth development, enamel, dentine, cementum, pulpal tissue and periodontal ligaments.

The exercises in this manual must be completed periodically as to coincide with the relevant lectures and submit to the lecturer concern. The marks attained will contribute to the Oral Biology continuous assessment.

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July 2015

Table of Contents

1. Tooth Development – bud to bell stage and root formation

1. Draw tooth development at bud stage and name the figure as mentioned

	A	Oral epithelium
	B	Dental lamina
	C	Enamel organ
	D	Condensation of ectomesenchymal cells

2. Draw tooth development at Cap stage and label the figure as mentioned

	1	Oral epithelium
	2	Dental Lamina
	3	Outer enamel epithelium (OEE)
	4	Inner enamel epithelium (IEE)
	5	Stellate reticulum
	6	Dental follicle
	7	Dental Papilla

3. Draw tooth development at Bell stage and label the figure as mentioned

	1	OEE
	2	IEE
	3	Ameloblast layer
	4	Odontoblastic layer
	5	Dental Papilla
	6	Cervical loop

Root formation

Explain Hertwig's epithelial root sheath (HERS).

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Give the function of HERS.

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2. Eruption and shedding of teeth

A. What is tooth eruption? ……………………………………………………………………………………

B. Describe briefly the accepted theories of tooth eruption during eruptive stage,

C. What is meant by shedding of tooth?.

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D. Draw the shedding of primary **incisor** tooth and its erupting secondary tooth

E. Draw the shedding of primary **molar** tooth and its erupting secondary tooth

3. Enamel and Amelogenesis

A. Briefly describe the life cycle of Ameloblast in amelogenesis.? ……..

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B. Draw the arrangement of enamel rod in the enamel matrix

C. Draw the direction of enamel rods in **permanent** teeth (incisor and molar)

Incisor	**Molar**

D. Draw the Tomes Process of an ameloblast

E. Describe briefly on **Reciprocal induction**. ……

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F. What is the difference between:

1. Striae of Retzius and Neonatal lines. ……

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2. Enamel Spindle and Enamel Tufts. ……

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3. Enamel lamellae and cracks in enamel. ……

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4. Dentine and Dentinogenesis

A. Draw an odontoblast with its dentinal tubules

B. What is the difference between:

1. Primary and secondary dentine ……

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2. Peritubular/Intratubular dentin and Intertubular dentin. ……

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3. Neonatal line, lines of von Ebner and contour lines of Owen. ……

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4. Predentin and mantle dentine ……

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D. Describe the accepted **theories on dentinal sensory** mechanism/dentine sensitivity.

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5. Cementum and Cementogenesis

A. Differentiate between acellular cementum and cellular cementum

Acellular cementum	**Cellular cementum**
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B. Draw and describe the 3 patterns of CementoEnamel Junction.

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C. Explain the functions of cementum.

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D. What is Hypercementosis? ……

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E. What is the significant of hypercementosis during tooth extraction. ……

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6. Dental Pulp

A. Describe briefly the functions of the dental pulp

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B. Describe the role of the pulp in healing

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C. Draw and Describe the zones of the pulp.

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D. Describe the aging changes of the dental pulp.

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7. Periodontal Ligament

A. Describe the functions of the periodontal ligament.

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B. Draw and label the **principal fibers** of the periodontal ligament.

C. Describe the functions of each group of principal fibers of periodontal ligament

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8. Comparative

a. In the table below, compare the physical and chemical properties of the dental hard tissues.

	Enamel	**Dentin**	**Cementum**
Physical properties Colour			
Thickness			
Hardness			
Permeability			
Elasticity			
Resistance to resorption			
Chemical Composition Organic substances			
Inorganic substance			

b. In the table below, compare the **age changes** undergone by the dental tissues.

Items	***Enamel***	**Dentin**	**Cementum**	**Periodontal ligaments**