

Tooth development

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General Structure and Function

Teeth are small calcified structures whose functions are mastication (chewing) of food and so breaking it down. There are 32 teeth in the human mouth and in general terms is divided into quadrants consisting of 2 Incisors, 1 Canine, 2 Premolars and 3 Molars.

The teeth have a hard substance called Enamel on its surface and covers the upper portion of Dentin. Beneath the Dentin lies the pulp cavity which houses the vascular supply of the tooth. Then below this the Cementum that connects collagen fibers to Dentin and the alveolar wall.

Teeth are rooted in the gums of oral cavity and their development occurs early on during the embryological stage.

Embryological development

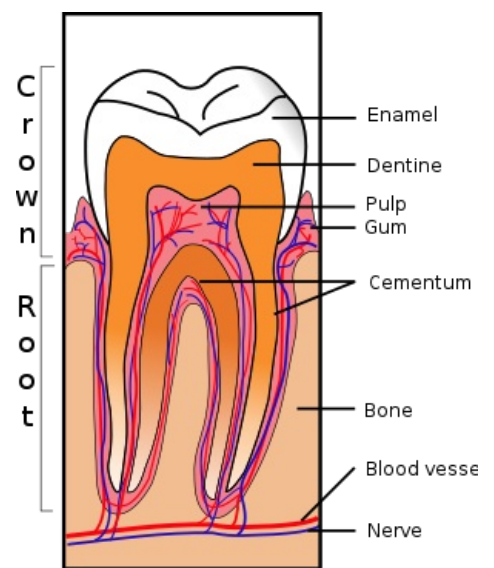
Teeth develop from the mesoderm and neural crest cells during embryological development. The Homeobox gene is responsible for initiating tooth development: The process is termed "Odontogenesis".

At the 6th week of development the oral epithelium thickens and dental laminae develop 10 centres of proliferation into toothbuds. At the 7th week the deciduous teeth develop and eventually the development of tooth-buds for permanent teeth during the 10th week.

Tooth-buds are invaginated by mesenchyme and become cup shaped. The internal part of the bud/cup is the Enamel Reticulum that is derived from Ectoderm. The mesenchyme surrounding the tooth condenses into the Dental Sac- a vascularised cap structure on the tooth.

As dental cup grows, it becomes more indented, so much so that it begins to resemble a bell shape. The inner layer of mesenchyme differentiates into Odontoblasts which produce Predentin, a prerequisite for Dentin. As Dentin continues to be produced and deposited, the pulp cavity is reduced and there is now a narrow root canal where vessels and nerves can pass.

The inner epithelium cells differentiate to Ameloblasts that produce Enamel- the hardest tissue overlying Dentin, which functions as protection for the tooth.



Tooth Section

Tooth Eruption

Tooth Eruption is the process and order in which the teeth develop. The deciduous teeth, consisting of 2 Incisors, 1 Canine and 2 Molars (in each quadrant) erupt as follows:

Incisor 1	Incisor 2	Canine	Molar 1	Molar 2
6-8 months	8-10 months	16-20 months	12-16 months	20-24 months

Whereas the permanent teeth erupt as follows:

Incisor 1	Incisor 2	Canine	Premolar 1	Premolar 2	Molar 1	Molar 2	Molar 3
7-8 years	8-10 years	11-12 years	10-11 years	11-12 years	6-7 years	11-12 years	13-25 years

Bibliography

