Hello students in this unit integumentary system, this module is going to discuss about the epidermis of derivatives and their types. Depending on the on their structure. We're going to classify the epidermal glands based on their structure. That is, the tubular glance and Alveolar Glands and their further modifications. The student at the end of this module will be able to enlist the structural types of epidermal glands with examples and differentiate between the tubular and alveolar glands and explain the complexity of structures of glands.

Epidermal soft derivatives.

The soft derivatives refer to non keratinized structures arising from the epidermis. That is the integumentary or epidermal glands. These glands may be seated into the epidermis, or dermis. Though they arise from the stratum germinativum layer of the epidermis, that is, the active layer and they are seated into the dermis, cause to remain in a close association with the blood vessels which supply raw materials for their secretion.

They are classified into various types on the basis of their structure and functions.

I said before the epidermal glands arise from the stratum

germinativum or Malphigian layer

of epidermis. They communicate with the skin surface via duct

system, though they are seated deeper into the deeper parts of

the dermis because they have a duct system which connects them

to the skin surface. They can be called as exocrine glands, which

differentiates them from the endocrine ductless glands.

Every exocrine gland has two parts, that is a

secretory unit and a duct system. Now, depending on the number of cells present, the

epidermal glands can be classified into unicellular

glands and multi cellular

glands. And depending on the type of the branching that the

duct system has, they can be classified into simple and

compound glands and depending on the different shapes that the

secretary unit acquires, they can be classified into tubular

and alveolar glands.

This flow chart shows the classification of epidermal glands into unicellular and multicellular glands and only the multi cellular glands have modifications in their secretory units. Therefore they are classified into

tubular and alveolar glands.

Unicellular glands They are a characteristic feature of the

integument of aquatic chordates. They are modified cells of epidermis or modified epithelial cells, which have a granular cytoplasm and also a nucleus. The secretory product of the unicellular glands is a mucin. Mucin reacts with the aqueous medium surrounding the body of the organism and when it reacts with the water medium, it forms the mucus or a

slime. Usually this mucus forms a coat over the body surface of the aquatic organisms, and it helps to protect them against the harmful foreign agents which usually try to

intrude through the skin. And it also prevents desiccation.

Sometimes they help in escaping from predators as in cyclostomes. In all the chordates also include level amphibians who also have abundant of mucus glands on their skin surface.

In amphibians, when they venture into the terrestrial habitat this mucus coat helps them to maintain a cutaneous respiration.

There are specialized types of unicellular glands known as the granular gland cells and club or beakers cells found in lampreys or hagfishes. They also secret mucus.

Multicellular glands forms in growth of the stratum germinativum. So therefore they in grow from the stratum germinativum and reside into the deeper parts of the dermis. The raw materials for the secretion, as I said before, are supplied by the blood vessels or the blood capillary network that is found in the dermis.

Depending on the type of the structure of the secretory unit they are classified into tubular and alveolar glands, and further depending on the type of the branching of the duct system they are classified into simple or compound glands.

This picture shows complexity or modification in the tubular glands. The Tubular glands or a simple tubular gland a tube with a uniform diameter with a blind end ending into the deeper parts of the dermis.

Simple tubular gland is a tube of uniform diameter which arises from the epidermis but ends blindly into the deeper parts of the integument. When this blind ending shows coiling, they can be called a simple coiled tubular gland. For example, the sweat glands in the integument of mammals.

In a simple branched tubular gland, the duct system shows moderate branching and all the branches of the main duct connect directly to the main duct via a connecting doctor.

In the compound tubular gland there is a severe branching of the main duct which is seen, and this extensive branches deviating from the main duct connect to the main duct via connecting ducts. Example the mammary glands of egg laying mammals that is monotremes. Simple alveolar glands are also known as acinar glands or saccular glands.

These glands have a specific structure that is their flask shaped and they are connected to the skin surface via a neck with excretory duct. So a simple alveolar gland has a very basic structure. It is a simple flask like shape with which connects to the exterior skin surface via duct system. Example, the Mucus and poison glands of frogs and toads. The simple branched alveolar gland has a main duct from which branches off small saccules or small flasks. These saccules connect to the main duct via connecting ducts. Example the sebaceous glands of the mammals.

The third complexity is the compound tubulo alveolar gland. This gland consists of number of units. This gland consist of number of units known as lobules. Each of this is known as a lobule and this each lobule is made up of several small flasks known as saccules. These saccules connect via small ductules to the common duct. Many such common ducts from different lobules will join the main duct which is a broadway towards the exterior skin surface. The common example of this type of compound, tubule alveolar gland, is the mammary glands of all mammals, except the monotremes.

These books can be referred for further reading by the students.

Thank you.