

ANAT 2160/BIOL 3430 Integument Laboratory Module

Objectives:

- 1) To identify the layers of the epidermis and the principal functions of each layer
- 2) To understand the connective tissue structure and the functional roles of the dermis and hypodermis
- 3) To determine the structure and appearance of hair follicles and integument-associated glands

Overview:

Each of the slides listed below has different staining patterns, so you will not be able to see all of the features of the skin on every slide. The descriptions indicate what is easily visible on each slide, but you should explore each one thoroughly to identify as many structures as possible. Analyze each slide to identify epidermal layers, regions of the dermis, follicles and glands, and the presence of hypodermis.

26, thick skin. The section on this slide was taken from a fingertip, cut perpendicular to the skin surface to show all the epidermal layers. The outer layers are very stiff in thick skin, so may have been split off from underlying tissue during processing of this slide. All epidermal layers are thicker in this type of skin than in thin skin, therefore more easily identified. On this slide the epidermis is well-stained, and the stratum lucidum is particularly obvious. Use the high magnification objective lens and move the substage condenser lens slightly away from the slide, increasing the contrast to see faint cytoplasmic bridges between spinosum cells. Collagen fibres in the dermis are relatively lightly stained, but you should be able to observe sweat glands with their secretory parts deep in the reticular layer. These are simple coiled tubular glands. Can you follow a duct toward the surface from a sweat gland? What is the difference in epithelial structure and staining between the secretory and duct portions of sweat glands? Do you see any hair follicles?

216, thick skin. All epidermal layers are clearly identifiable on this slide, but parts of the outer epidermal layers may be separated from other tissues. The granules in cells of the stratum granulosum are prominent, but epidermal bridges are not easily seen between spinosum cells. Although collagen in the dermis is not deeply stained the dermis is extensive and there is hypodermis present in most of these specimens. Blood vessels as well as lymphatic vessels (large, irregular and partly collapsed lumens, simple squamous endothelium, no erythrocytes) are prominent throughout the dermis. In the hypodermis you may see relatively large, pale-staining structures that look like onions cut in half; these are touch receptors called Pacinian corpuscles.

37, thin skin. Compare all the features on this slide with those of thick skin. The stratum corneum is represented by only a few layers of dead keratinocytes in this type of skin, and these may have separated from the underlying tissue. Identify as many layers of the epidermis as you can, and analyze the dermis. What is the pattern of dermal ridges and papillae compared with thick skin? Look for capillaries in the dermal papillae near the epidermal basement membrane. Dermal collagen fibres are stained a reddish orange

color. Is there a hypodermis present? Hair follicles are cut mostly in oblique section. You will likely not see a complete hair follicle anywhere in your section, so look over the whole section to find partial follicles. Identify the bulb with the matrix, dermal papilla, epithelial and connective tissue root sheaths, and sebaceous glands. In some examples of sebaceous glands the sebum and the secretory cells may have been washed out during processing. Where you can see a gland that appears full, look for non-staining granules in the secretory cells; these contained sebum.

141, thin skin. This slide shows the collagen fibres in the dermis very well, and may include some adipose tissue in the hypodermis.

21, thin skin. The staining pattern on this slide shows up hair follicles very well. Try to identify all the components of these follicles. There will be many follicles with segments of hair shaft remaining, so you may be able to see the details of this structure. A hair is made up of dead keratinocytes with the outer layer consisting of thin, flat cells called scales.

108, lip. Contrast the thin skin on the outer surface of the lip with the oral epithelium covering the inside surface. Can you tell where one epithelial type changes into the other? Note that the outer edge of the tissue section on some slides may be folded; do not be confused by this. The skin of the lip has numerous hair follicles, sebaceous glands and sweat glands. How do the glandular components of the skin differ from glands inside the oral cavity? The layers of the dermis are easily distinguishable. How can you distinguish between the bundles of collagen fibres in the dermis and the skeletal muscle fibres in the core of the lip? Are there any collections of lymphocytes in the dermis? The hypodermis is limited to a few patches of adipose tissue between the deepest layer of dermis and the outer limit of the skeletal muscle.