

LABORATORY EXERCISE 25: Histology of Gonads

Female Gonads: Ovaries

Examine a slide showing the ovary of a cockroach in longitudinal section, first under the lowest microscope power and then under higher powers. Note the zones of differentiation within the ovary unit or **ovariole**, especially the **germarium** and the **vitellarium**. Roaches and other relatively generalized Exopterygota (Hemimetabola) possess ovaries of the **panoistic** type, containing oocytes but no nurse cells (trophocytes). Select an ovariole that appears to be complete and draw it (**Drawing #47**), labeling (in addition to the zones of differentiation) terminal filament, oogonia, young oocytes, external sheath, primary oocytes, follicular epithelium, and germinal vesicle (like a nucleus in the oocyte). In the absence of a complete ovariole on your slide, try to reconstruct the whole from the fragments present thereby creating a composite drawing. Refer to Imms, fig. 43, Romoser, fig. 8-8, or Gillott, fig. 19.2.

Slides showing other types of ovarioles are on demonstration. Compare the **telotrophic** (acrotrophic) ovaries of Hemiptera (*Oncopeltus* sp.) and the **polytrophic** ovaries of Diptera (*Musca* sp.) with the panoistic type. Particularly note the nutritive cords (= microtubules) extending from a distal mass of nurse cells or trophocytes to the primary oocytes in telotrophic ovaries; in polytrophic ovarioles, masses of trophocytes are associated with each primary oocyte, being ensheathed together with the oocyte in follicular epithelium.

Male Gonads: Testes

Examine a slide showing the testis of a honeybee, grasshopper, bug (*Anasa* sp.), cockroach (*Periplaneta* sp.), or cricket (*Acheta* sp.) in longitudinal section and locate a relatively complete view of a single **sperm tube** (testicular follicle). Note the epithelial sheath and connective tissue between (among) tubules. Locate (roughly) the **zones of differentiation** within the tubule: germarium, zone of growth, zone of maturation (reduction division), and zone of transformation. Draw a testicular follicle (**Drawing #48**), showing these zones. Additionally, label spermatogonia, sperm cysts with spermatocytes, spermatids, and mature spermatozoa. The **apical cell** may also be visible. Refer to Romoser, fig. 8-2, or Gillott, fig. 19.5.

Several rather poor slides of mature **spermatozoans** are on demonstration. At worst, head and flagellum are clearly visible; in some of the better ones, some details of the spermatozoan head, including acrosome and nucleus, may be distinguished.