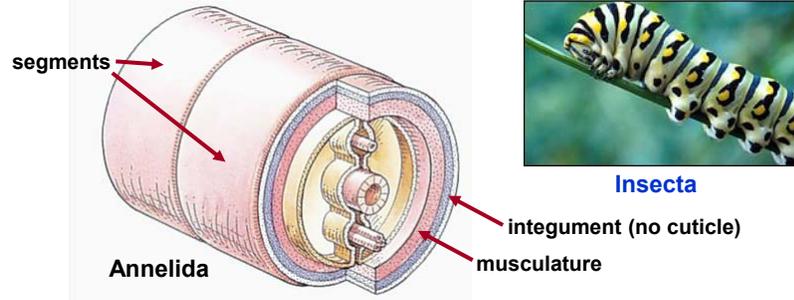


The insect **integument** and its derivatives (the “**body wall**”)

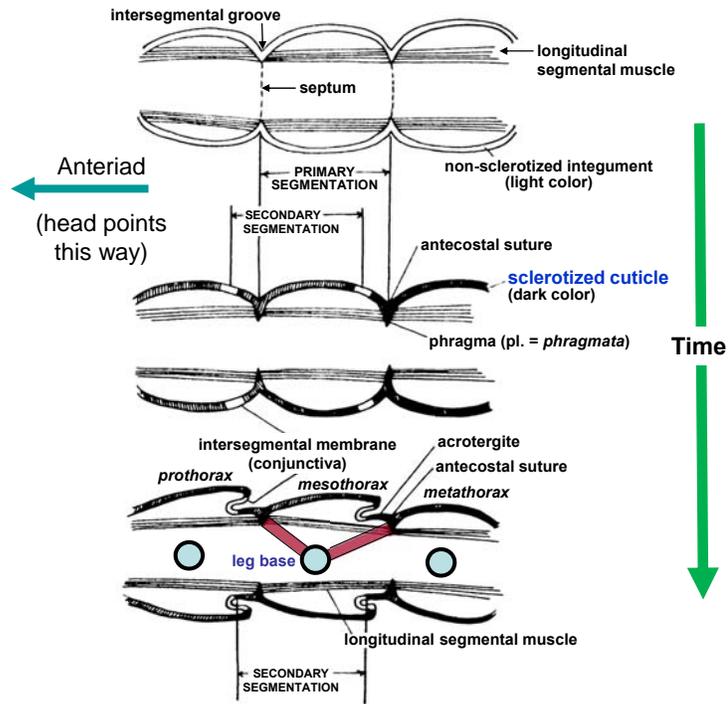
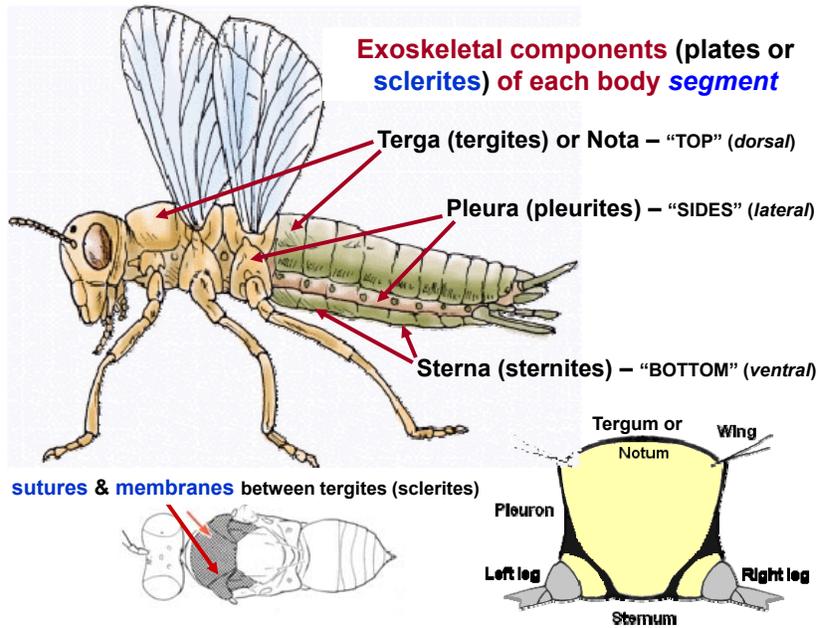
An early “skeleton:” the **hydrostatic skeleton**

A volume of incompressible fluid that transmits forces and pressures from muscular contraction through the body (i.e., many muscles needed).



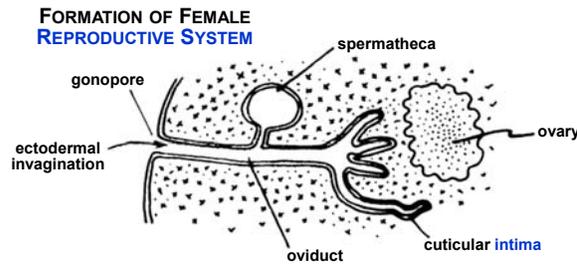
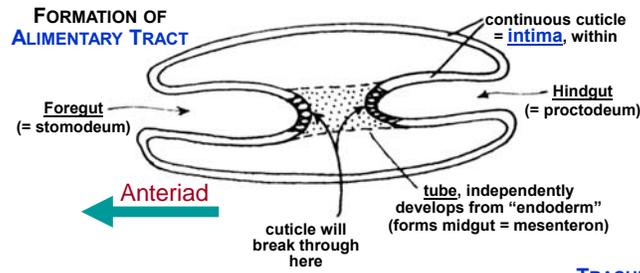
A **cuticular integument** – basic components





MORE CUTICLE:

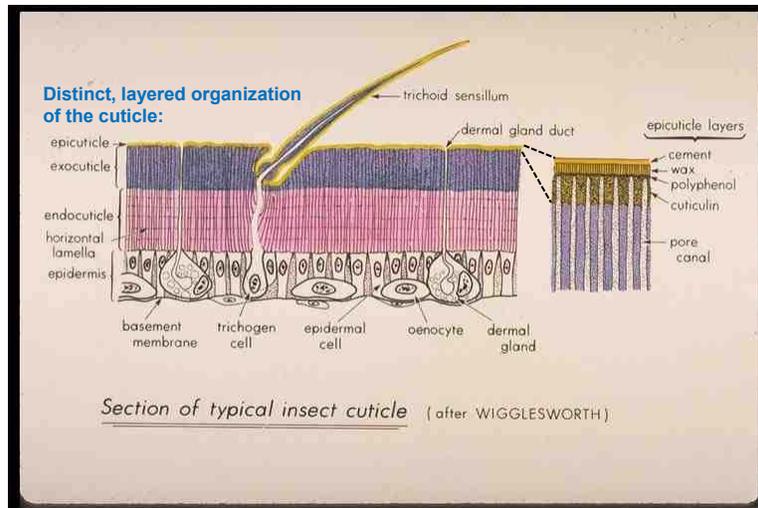
Formation of **alimentary tract, female reproductive system,** and **tracheal system** is from ectodermal integument



TRACHEAL SYSTEM

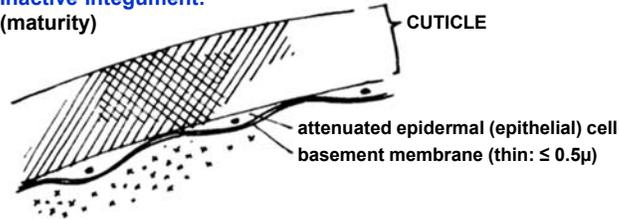


Ultrastructure of the insect integument (epidermis plus cuticle)

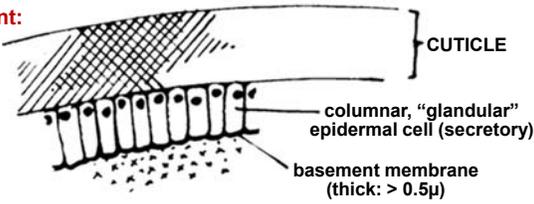


The epidermal layer: **inactive** versus **active integument**

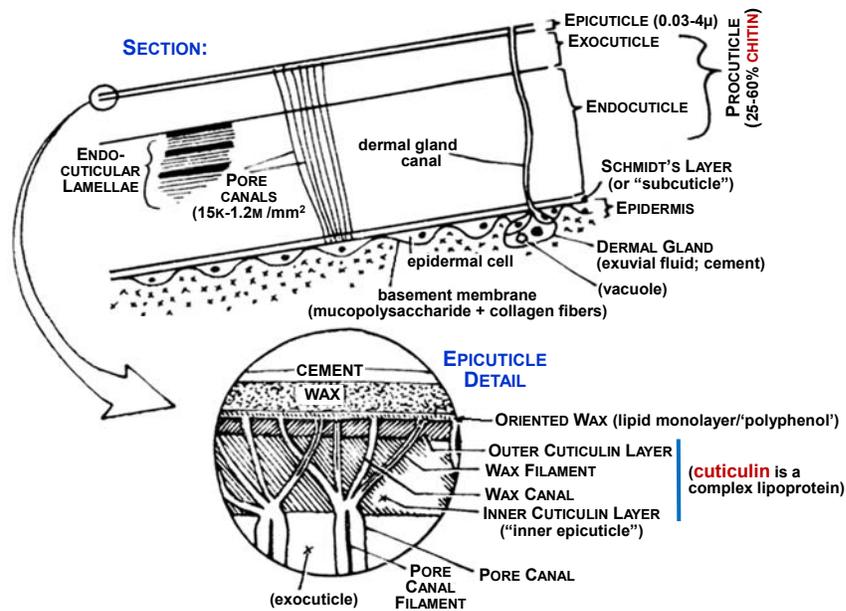
Inactive integument:
(maturity)



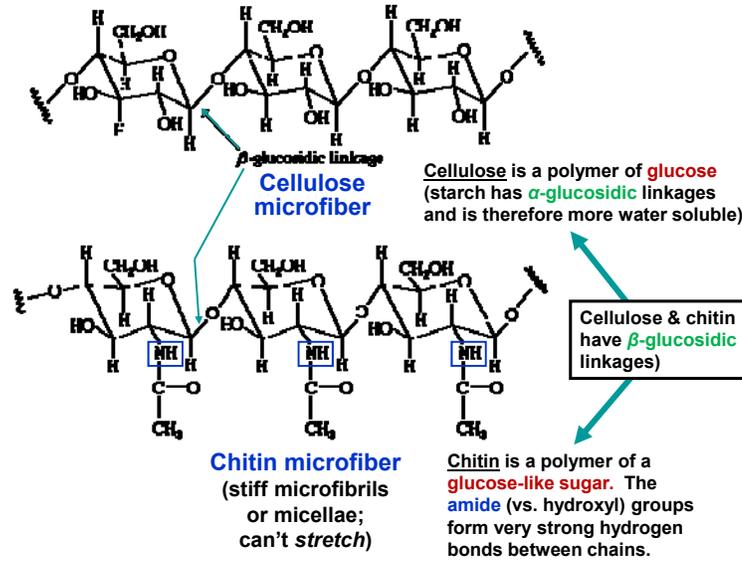
Active integument:
(shortly before ecdysis)



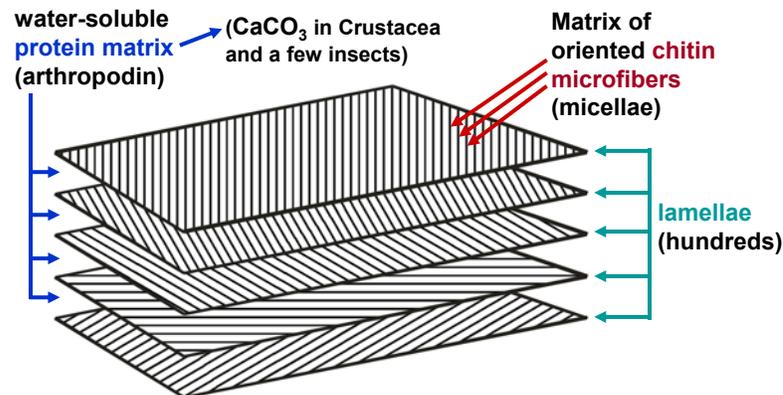
Mature, inactive integument:



Chitin is a major component (25-60%) of the **procuticle** (but is not present in epicuticle). It's a **polysaccharide**.

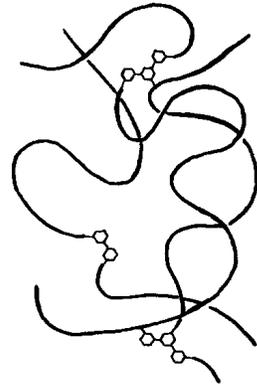


Procuticle = exocuticle (tanned) plus **endocuticle** (untanned)

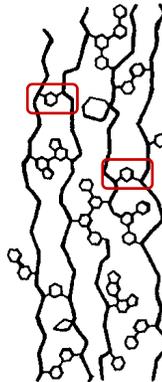


- The combination, linked together by covalent bonds, forms a **glycoprotein complex**.
- Tanned arthropodin = **sclerotin**, formed by cross-linkage of the protein polypeptide chains by quinone cross-linkage (and the removal of H_2O).

Sclerotization (tanning) of cuticle involves stabilization of protein (arthropodin) chains by quinone bridges

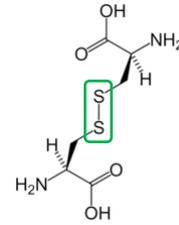


resilin



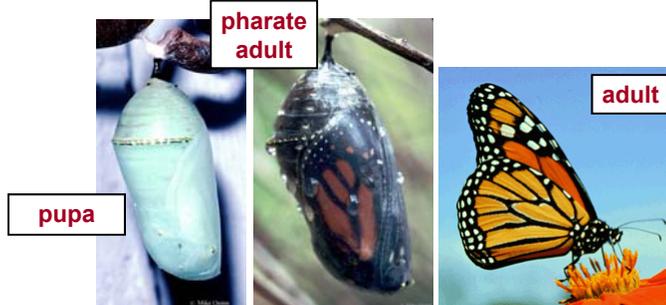
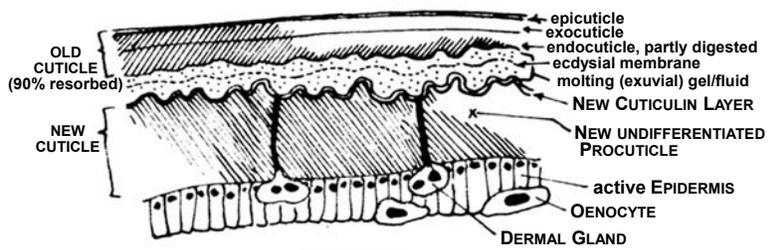
sclerotin

In **keratin** & some **Apterygota**:

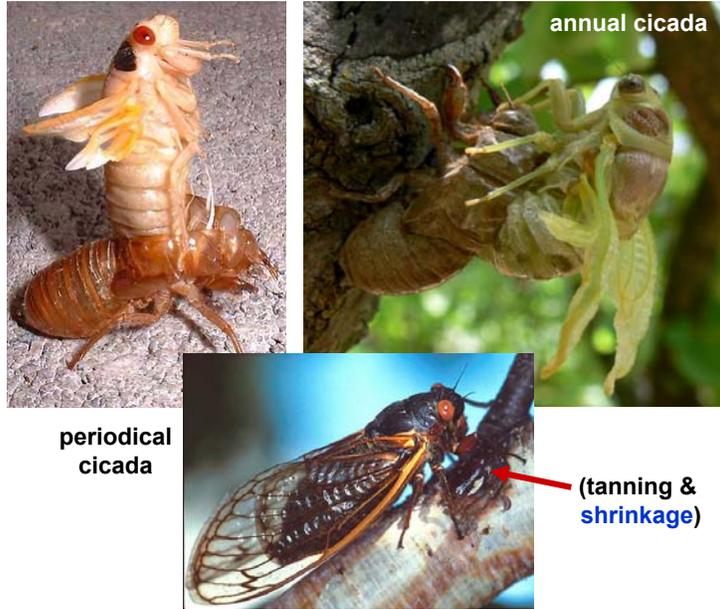


disulfide bonds

Integument late in the **molting cycle** (during **apolysis**):



Ecdysis (molting) & ecdysial cleavage lines



periodical cicada

annual cicada

(tanning & shrinkage)