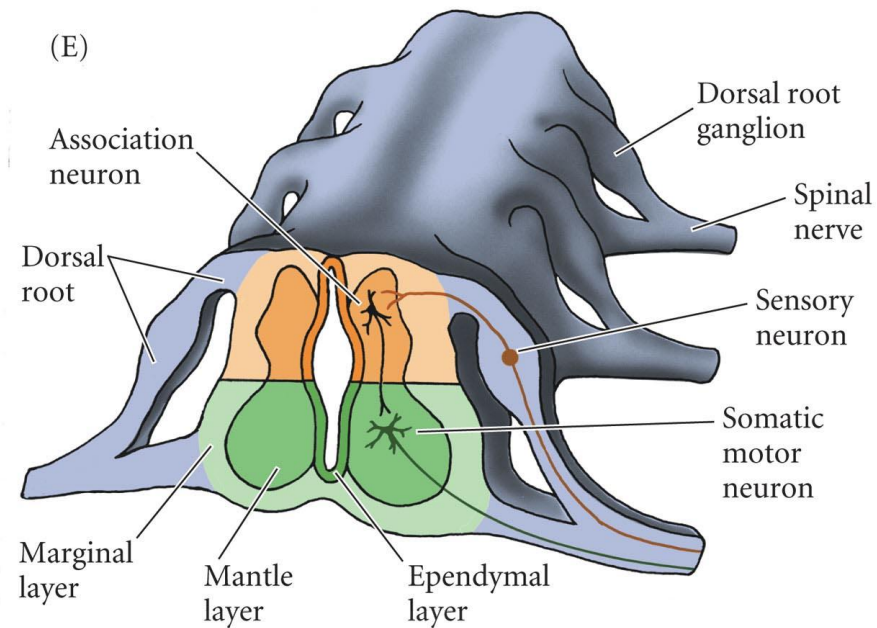
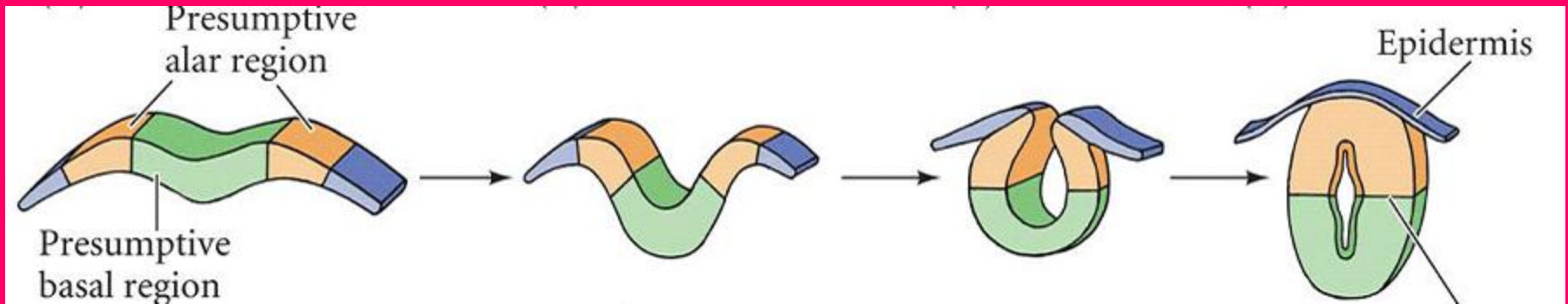


Spinal Cord Development



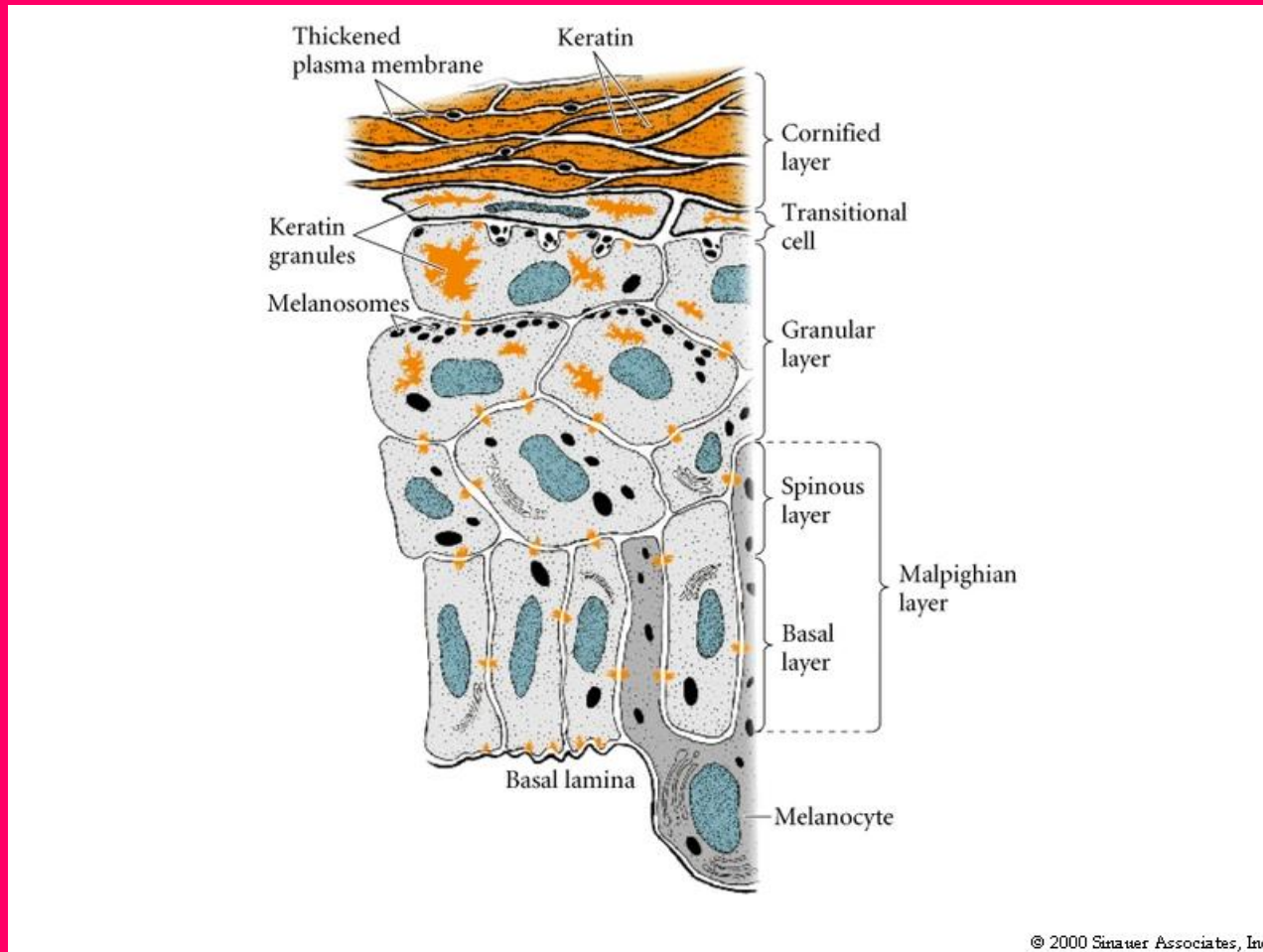
Nervous System of Trunk

- Voluntary (somatic) nervous system
 - mixed nerves
 - motor neurons from ventral root of spinal cord to organ
 - sensory neurons from neural crest grow short processes into spinal cord (dorsal root)

Nervous System of Trunk

- Autonomic nervous system
 - efferent neurons to:
 - cardiac and smooth muscle
 - digestive and sweat glands
 - some endocrine glands
 - includes sympathetic and parasympathetic
 - at least 2 efferent neurons
 - 1 with body in spinal cord or brain
 - connects to 2nd or 3rd to organ (from neural crest)

Section Through Epidermis



Epidermis

- Outer covering of embryo
- Basal layer → epidermis proper
 - -> spinous layer → granular layer → keratinocytes → cornified layer
 - neural crest cells make pigment and transfer to keratinocytes
- Division regulated by TGF- α and KGF (FGF-7)

Epidermis-Dermis Interactions

- Epidermis makes sweat glands, and hair, scales, feathers
- Basal cells of epidermis aggregate
- Mesoderm fibroblasts surround
- Stimulate epidermal cells to divide, differentiate, make keratinaceous structures

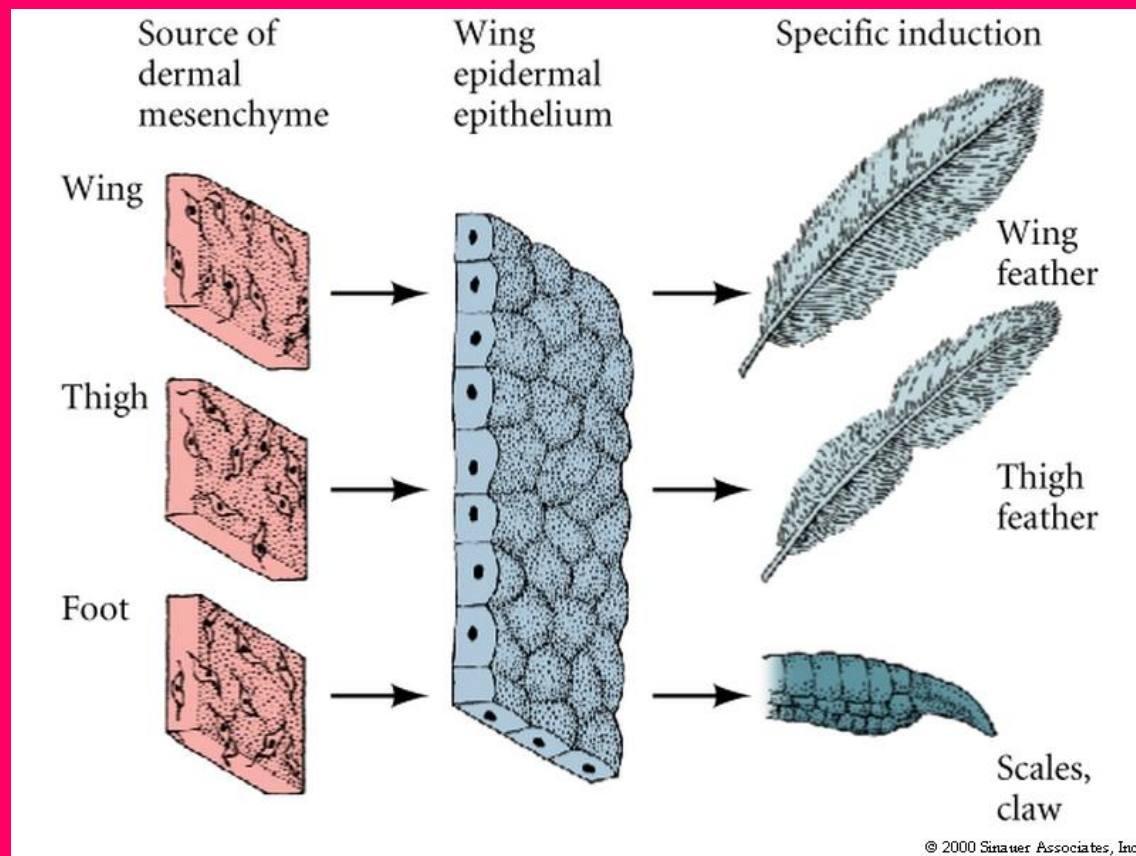
Induction of Epidermal Structures

- Embryonic chick
 - dorsal skin + dorsal dermis → feathers
 - ventral skin + ventral dermis → no feathers
 - ventral skin + dorsal dermis → feathers
 - dorsal skin + ventral dermis → no feathers
- So dermis controls whether feathers form from epidermis
 - induction

Specificity of Dermis

- Control of type of derivative
 - wing epidermis + wing dermis → long feathers
 - wing epidermis + thigh dermis → short feathers
 - wing epidermis + lower leg dermis → scales
- Heterologous combinations
 - chick cornea epidermis (normally induced by lens
 - plus mouse back mesoderm (what do you get??)
- Feathers! (not cornea, not hair)

Specificity of Induction

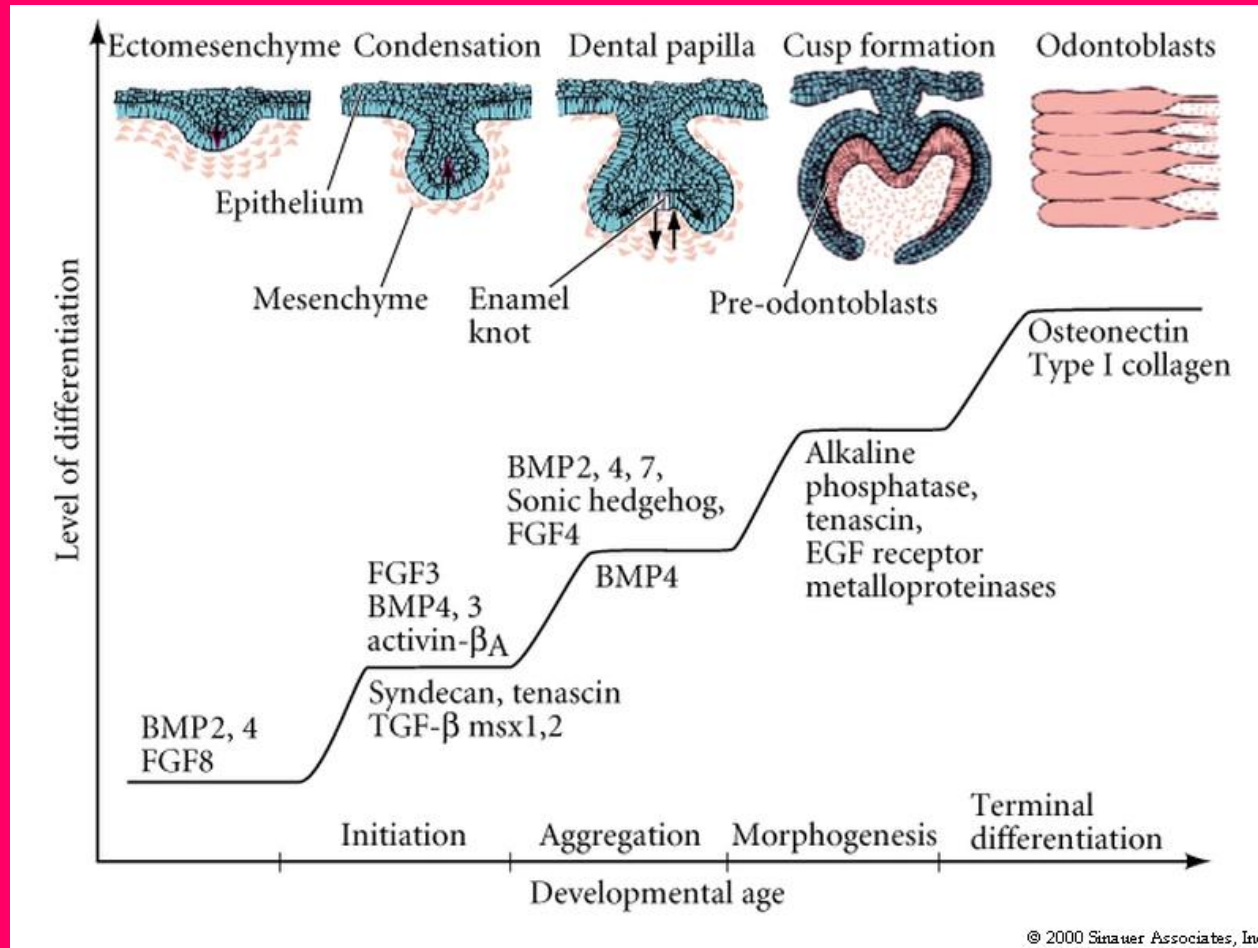


The Fur Bearing Trout

Fact or Fiction???



Tooth Formation



Epidermis-Dermis Interactions

- Tooth Formation
 - enamel epithelium
 - dental mesenchyme (papilla)
 - type of mesenchyme determines tooth shape
 - e.g. molar, canine, incisor
- Experiment
 - combine foot epidermis + dental mesenchyme
 - what do you get?
- Teeth!