# "Derivatives of Ectoderm"

The ectoderm is the outermost germ layer and gives rise to structures mainly involved in the nervous system, sensory organs, skin, and its appendages.

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## 1. Neural Derivatives

| Structure | Derivative / Function |
|---|---|
| Neural Tube | Central Nervous System (CNS) → brain & spinal cord |
| Neural Crest Cells | Peripheral Nervous System (PNS) → sensory neurons, autonomic neurons, Schwann cells, adrenal medulla cells |

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## 2. Sensory Organs

| Structure | Derivative / Function |
| --- | --- |
| Optic placodes → optic vesicles | Eyes (retina, optic nerve) |
| Lens placodes | Lens of the eye |
| Otic placodes | Inner ear sensory epithelium |
| Olfactory placodes | Sensory epithelium of nose |

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## 3. Oral & Dental Structures

| Structure | Derivative / Function |
| --- | --- |
| Enamel organ | Enamel of teeth |

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## 4. Glands

| Gland | Ectodermal Derivative |
| --- | --- |
| Pituitary gland | Anterior lobe (Rathke's pouch) |
| Mammary glands | Secretory epithelium |
| Subcutaneous glands | Sweat glands, sebaceous glands |

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## 5. Skin and Appendages

| Structure | Derivative / Function |
| --- | --- |
| Hairs | Hair follicles and shafts |
| Nails | Nail plate and nail bed |

# Flowchart of Ectodermal Derivatives

Ectoderm → Two major pathways:

1. Neural derivatives:

   Neural tube → CNS

   Neural crest → PNS

2. Surface ectoderm derivatives:

   - Sensory organs: Optic placodes → Eyes, Lens placodes → Lens, Otic placodes → Inner ear, Olfactory placodes → Nose

   - Teeth: Enamel

   - Glands: Pituitary, Mammary, Subcutaneous

   - Skin appendages: Hair, Nails

## High-yield Exam Points

- Neural crest cells are multipotent → PNS, pigment cells, adrenal medulla
- Surface ectoderm → all epithelial derivatives
- Placode derivatives → key for sensory organs formation
- Any failure in ectodermal development → congenital defects like anodontia, anencephaly, microphthalmia

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-> The End <-