

# Neuroectoderm

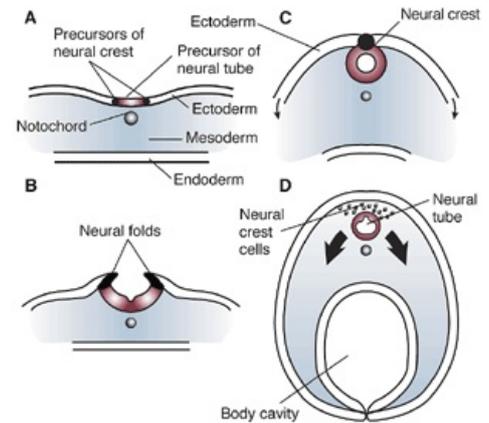
The **Neuroectoderm** is a cell population from the part of the ectodermal germ layer that has formed the longitudinal stripe and is the basis for the nervous system.

## Differentiation

The nervous system develops from the neuroectoderm, the basis of which is the medullary plate. It forms in the medial line on the dorsal side of the germinal plate and begins to differentiate into neuroectoderm cells. It extends from the anterior end of the germinal disc to Hensen's node, around which the edges diverge caudally, deepens into a furrow bounded by the lips (valves), the furrow closes and forms medullary tube (M.T.). Growth continues from the 4th somite faster cranially and slower caudally. A *neuroporus anterior et posterior* is formed at both ends of the medullary tube. Cranial head end of M.T. is differentiated in 3 parts:

- *prosencephalon*
- *mesencephalon*
- *rhombencephalon*;

The wall of the medullary tube is made of neuroectoderm. The ceiling is a layer of cells, the basis is the *lamina epithelialis choroidea ventriculi quarti*, the most oral end is the thinned *lamina terminalis*.



Vývoj CNS

## Neural crest

### Development and further differentiation

It arises before the closure of the medullary tube at the edge of the furrows, where the neuroectoderm cells differentiate. A continuous band is formed, which later splits into two cell bands along the edges of the tube. The bar is the basis of the **spinal ganglia**.

It extends cranially to the posterior end of the rhombencephalon and is the basis for the *ggl. nervi IX., XI.*, then continues cranially and forms the base of the *ggl. nervi V., VII.* It lengthens caudally compared to the medullary tube, soon the bar segments and forms the base *ggl. spinal*. Bundles of fibers to M.T.: posterior roots. The rest of the ganglionic bar breaks down into mesenchyme, which becomes part of the head mesenchyme. They will further develop from it:

- vegetative ganglia, the cells of which - sympatheticoblasts - travel into the organism, e.g. mesenterium to the alimentary canal and form intramural ganglia
- pigment cells form birthmarks
- cells become part of the cartilaginous blastema of the gill arches
- this also develops into odontoblasts, which travel to the surface of the dental papilla
- sympatheticoblasts also form the medulla of the adrenal gland (they do not have projections there).

In the 3rd week of development, it becomes a three-layered formation of the third germ layer - the mesoderm.

## Chorda dorsalis

It represents the primitive axis of the embryo, then the **nuclei pulposi** of the intervertebral discs arise from it. The chorda dorsalis is a kind of inducer for the proliferation of cells in the ectoderm above it. It begins to differentiate from the surrounding ectoderm by cells of the neuroectoderm and thus a neural plate is formed from a multi-rowed cylindrical epithelium (giving rise to the CNS and the ``crista neuralis). The neural plate is wide in the cranial part (base of the brain), narrows caudally (spinal cord), extends from the anterior end of the germinal plate to the primitive node. On the 18th day, the neural plate is pinched in the center (neurulation process), a ``neural furrow is formed and around it the ``neural mounds, it closes craniocaudally - ``neuroporus anterior et posterior. After the fusion of the neural crests, the medullary tube remains in the middle.

## Links

### Related articles

- Third week of embryo development

### Externallinks

- Neuroectoderm (<https://en.wikipedia.org/wiki/Neuroectoderm>)
- Neuroectoderm derivatives (<http://www.wikidoc.org/index.php/Neuroectoderm>)

## Used literature

- VACEK, Zdeněk. *Embryologie pro pediatriy*. 2. edition. Nakladatelství a vydavatelství JP, 0000. 313 pp. ISBN 80-7066-562-9.
- SADLER, Thomas, W. *Langmanova lékařská embryologie*. 1. české edition. Grada, 2011. 414 pp. ISBN 978-80-247-2640-3.