

Development of the Spinal Cord

The spinal cord, and with it the Central Nervous System (CNS), begin its development in the 3rd week of the embryonic period.

At approximal 21 days after fertilization, the ectodermal germ layer is pear shaped, and broader in the cephalic (head) than in the caudal region. Around this time, the Epiblast cells move towards the primitive streak and slip under it to migrate along the median line cranially to form the **notochordal process** and later **Notochord**. The appearance of the notochord generates the overlying ectoderm to elevate and thereby forming the **Neural Plate**. The cells found in the neural plate represent the **neuroectoderm**. Its occurrence represents the beginning in the process of **neurulation**.

Neurulation

Is the process where the neural plate forms the neural tube. At the end of the 3rd week, the lateral edges of the neural plate rise due to elevation caused by the underlying migration of epiblast cells, and forms the so called **neural folds**. Between these neural folds, a depressed region appears, namely the **neural groove**. The neural folds on each side of the neural groove fuse together. This fusion proceeds from cranial to caudal. The result of this fusion is the formation of the **neural tube**. Until the fusion is completed at about day 28, the cephalic and caudal ends of the neural tube communicate with the surrounding amniotic cavity by the **cranial and caudal neuropores**. When these neuropores are closed, the CNS is represented by the closed neural tube with a broader cephalic portion, the **brain vesicles** and the caudal portion which represents the **spinal cord**.

Spinal Cord

The wall of the neural tube consists of **neuroepithelial cells**. They are significant due to their pseudostratified epithelial formation. After closure of the neural tube, these cells divide and thereby increase rapidly in number, and give rise to the primitive nerve cells, **Neuroblast**. The neuroblast cells accumulate themselves around the neuroepithelial layer and form the so called **Mantle Layer** which later will form the gray matter of the spinal cord. The lateral layer of the spinal cord is known as the **marginal layer** and contains nerve fibers which arise from the neuroblast cells in the mantle layer. These fibers become myelinated, which gives this layer the significant white colour and therefore this part is called the **white matter** of the spinal cord.

Yes, I agree, very bueno.

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Bibliography

- SADLER, Thomas, et al. *Langman's Medical Embryology*. 10. edition. Lippincott Williams & Wilkins, 2006. 371 pp. ISBN 978-0781794855.
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