

2',3'-Cyclic Nucleotide 3'-Phosphodiesterase;
myelin-associated enzyme; 4% of total CNS myelin protein,

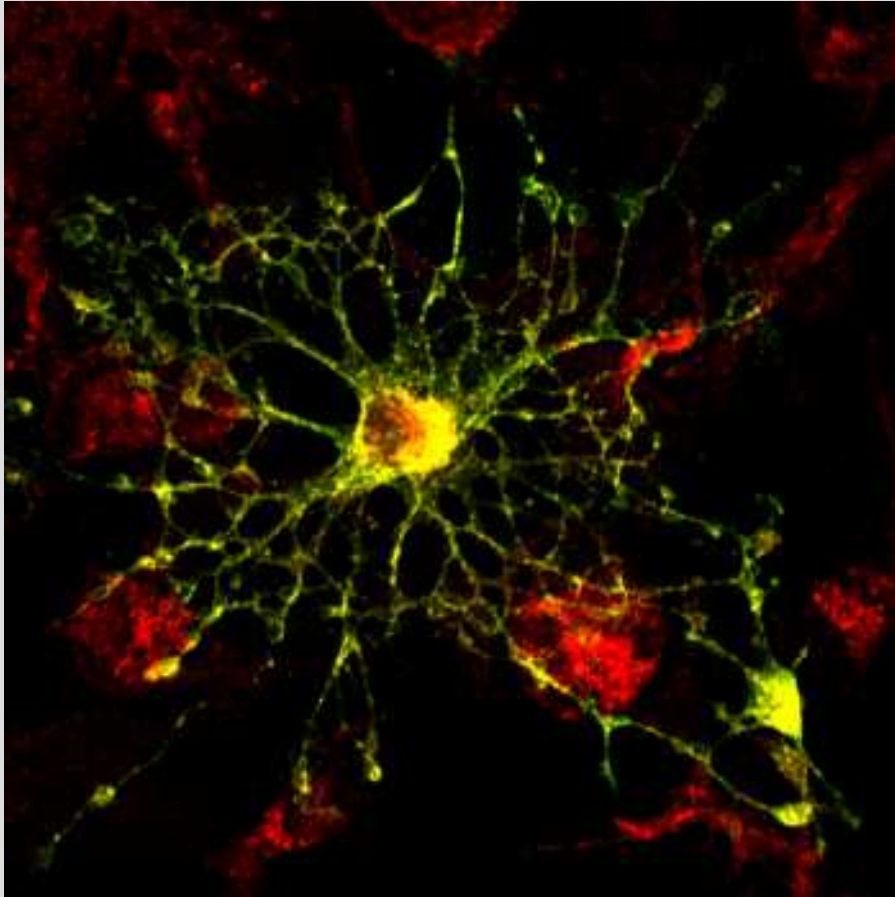
Myelin Proteolipid Protein (Folch-Pi prot.; lipid-oldékony)

Myelin basic protein

Galactocerebroside

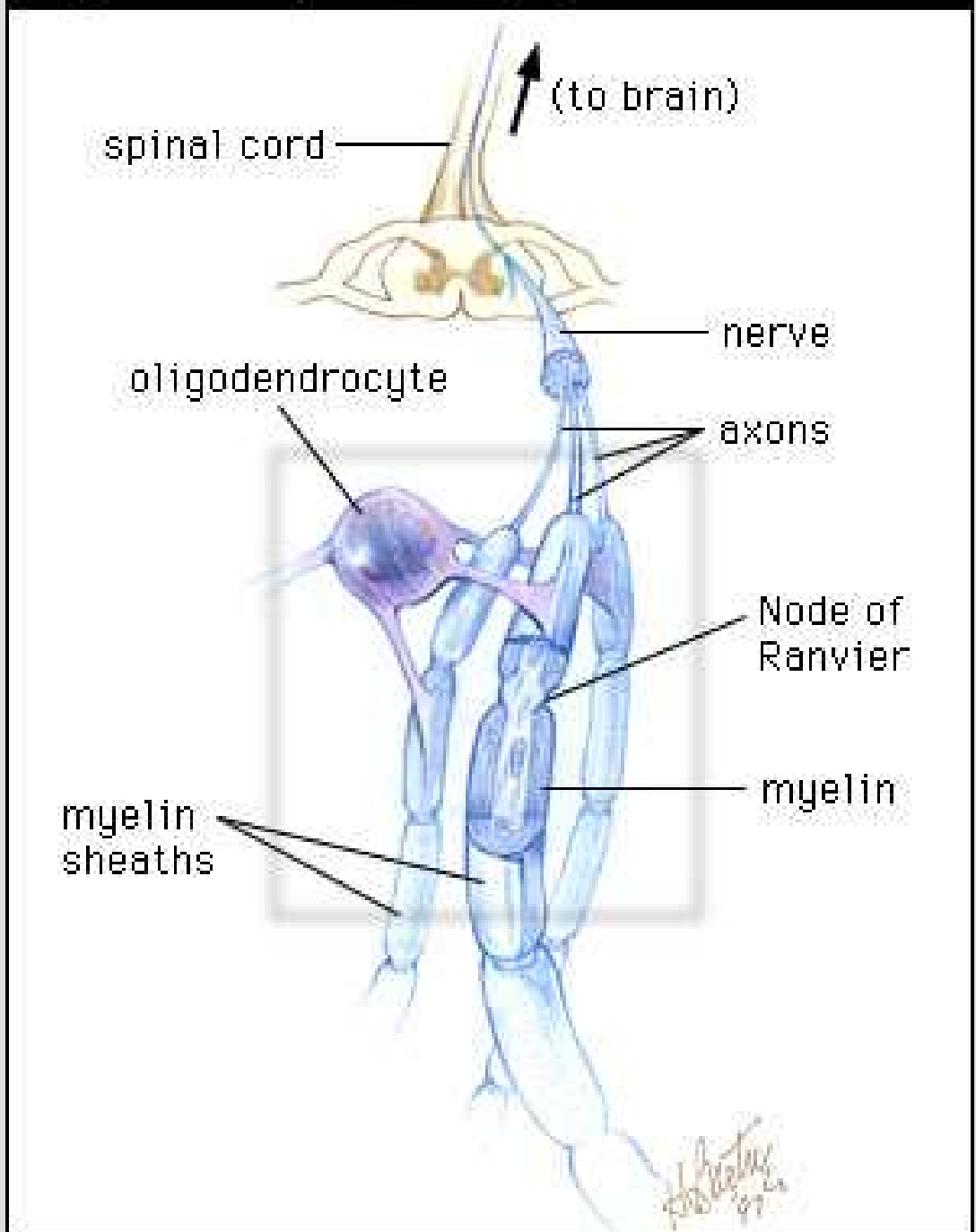
MAG; Mogp; O4;

Szénsav-anhidráz

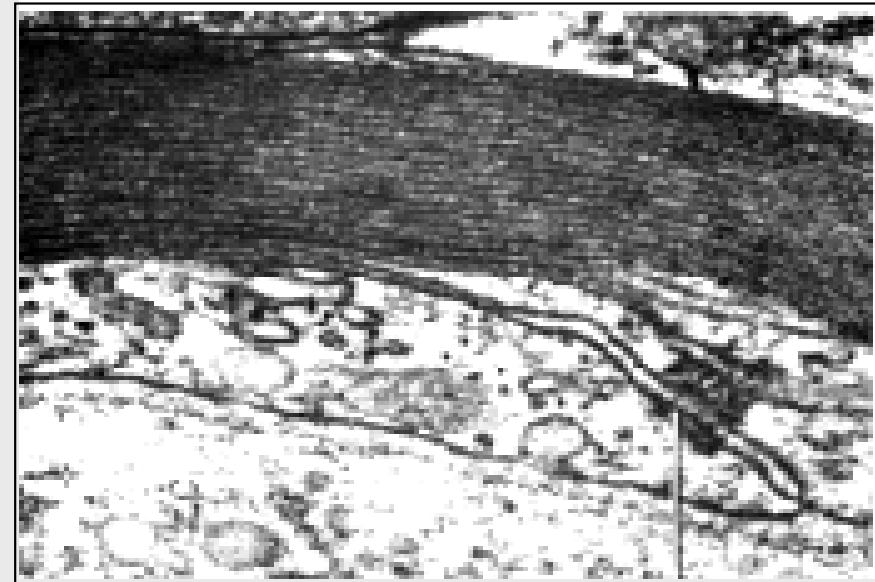
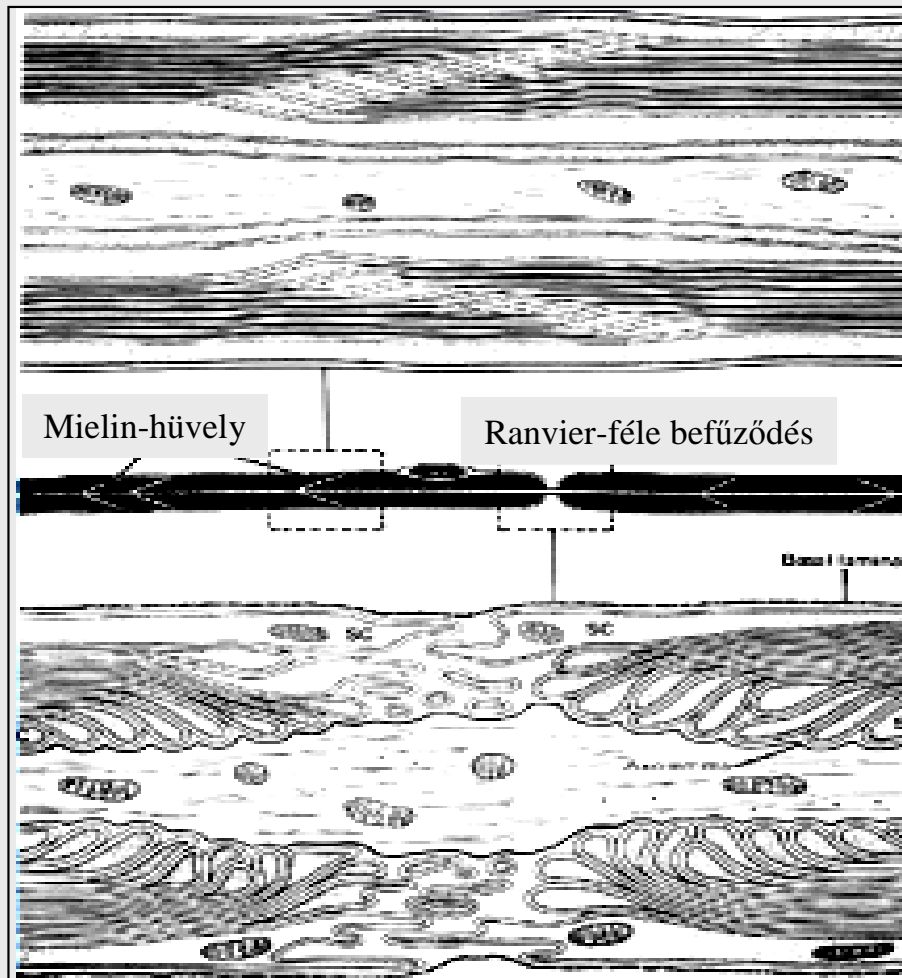


1 oligo : 50 axont is burkolhat

Oligodendrocyte Making Myelin



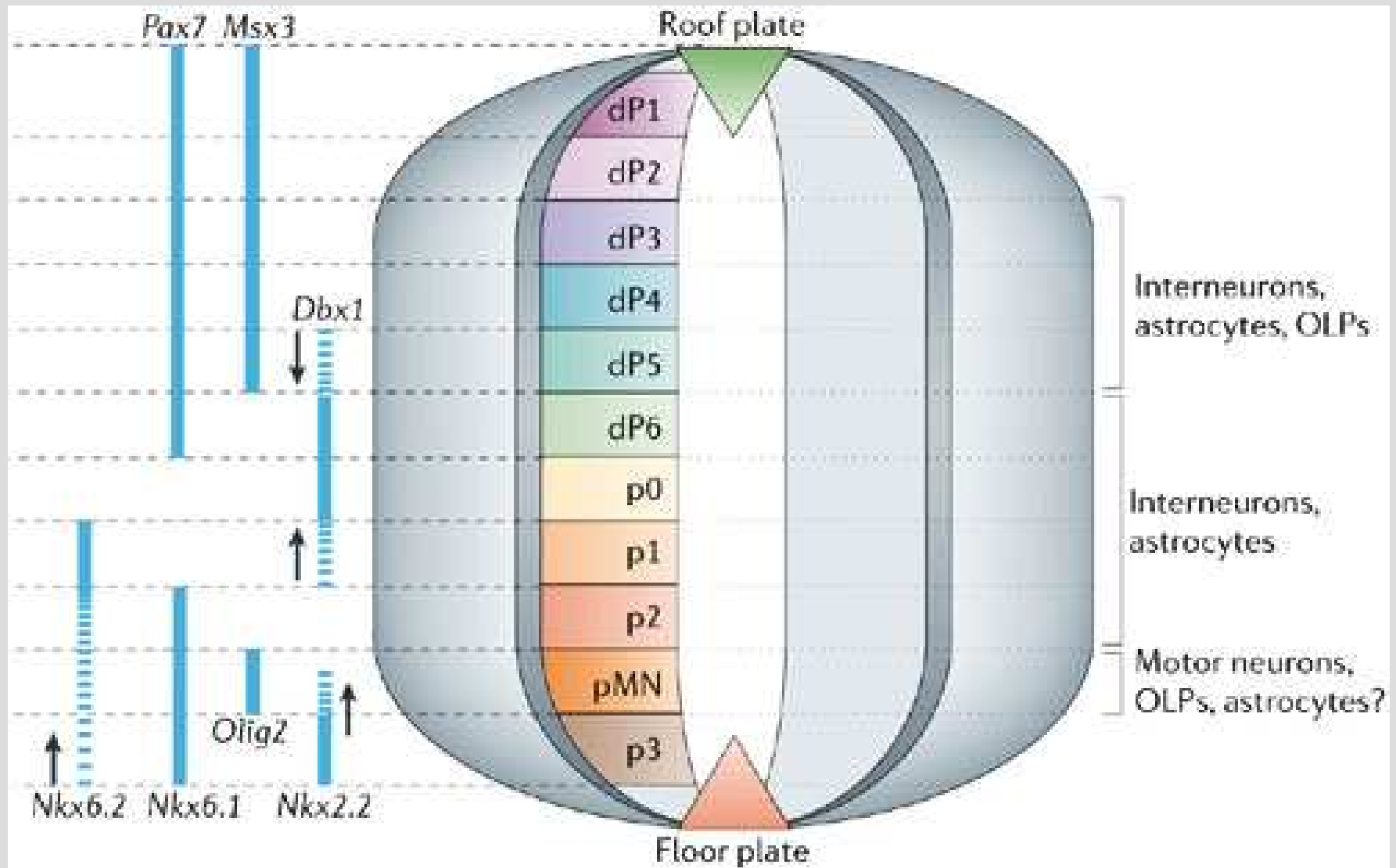
Mielin-hüvely



Axon vezetés sebessége lehet akár 100 m/sec (360 km/óra)

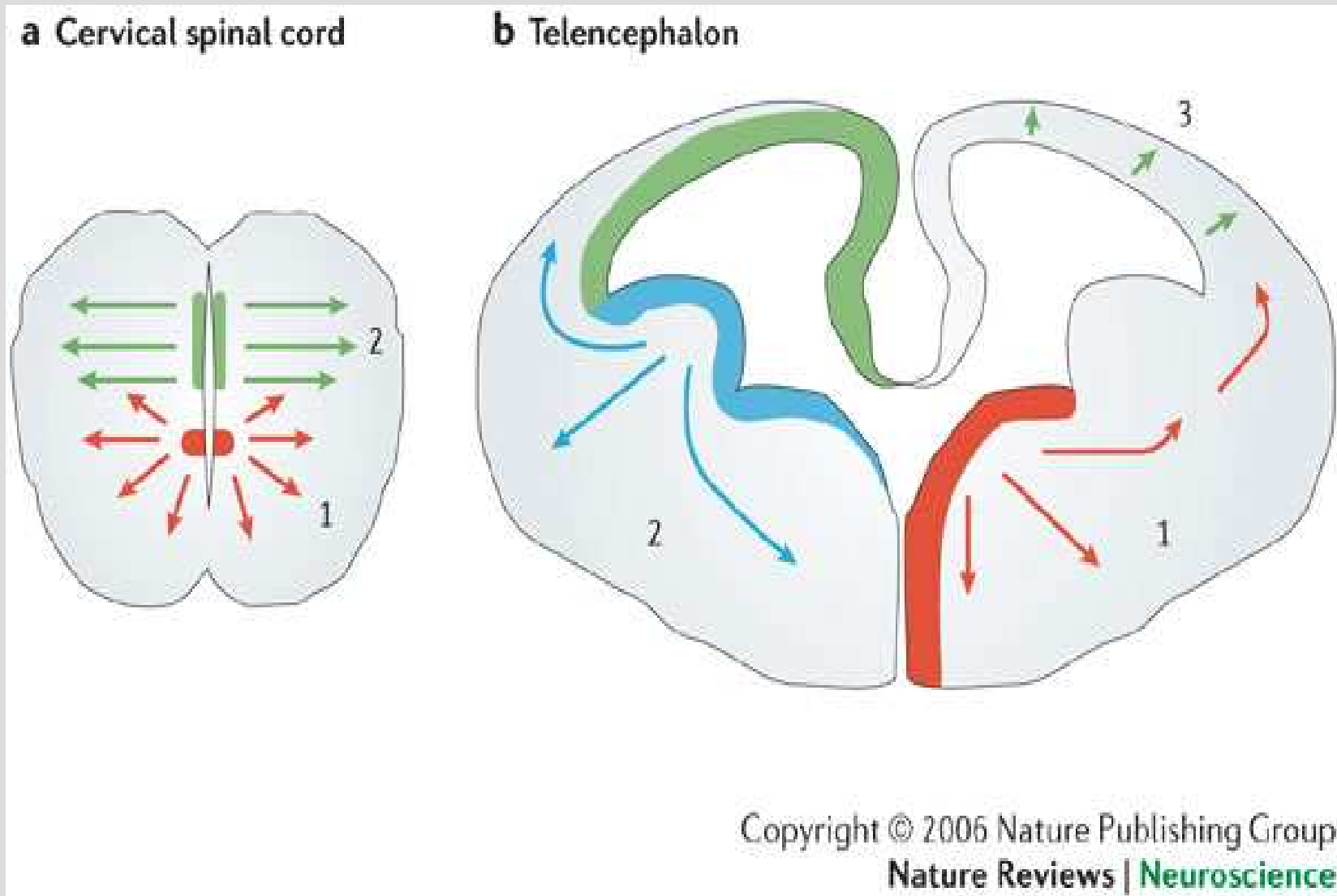
Gerinctelenekben: vezetési sebesség növelése az axon-átmérő növelésével.

Max. Vezetési sebesség ~ 25 m/sec (90 km/óra)



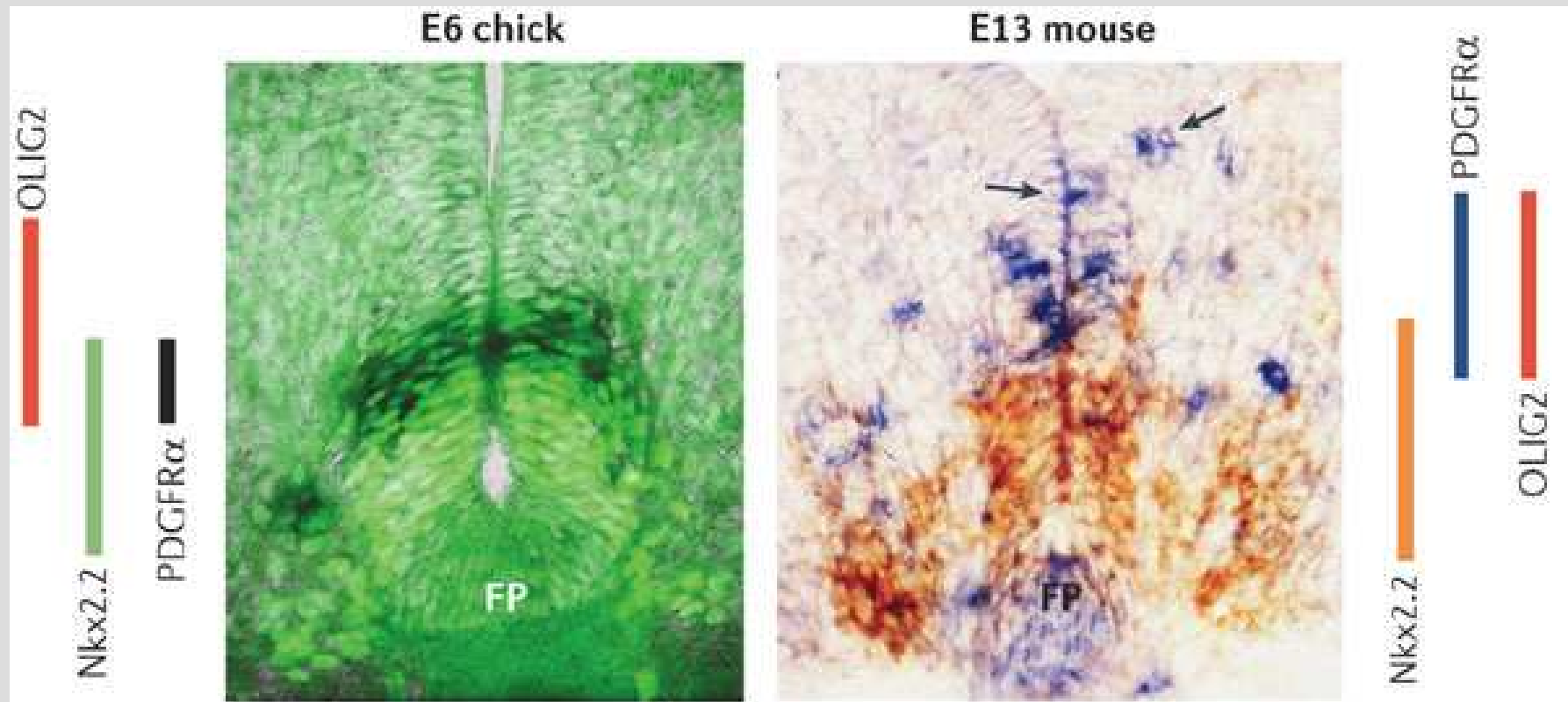
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*William D. Richardson, Nicoletta Kessaris and Nigel Pringle
 Nature Reviews Neuroscience 7, 11-18 (January 2006)*

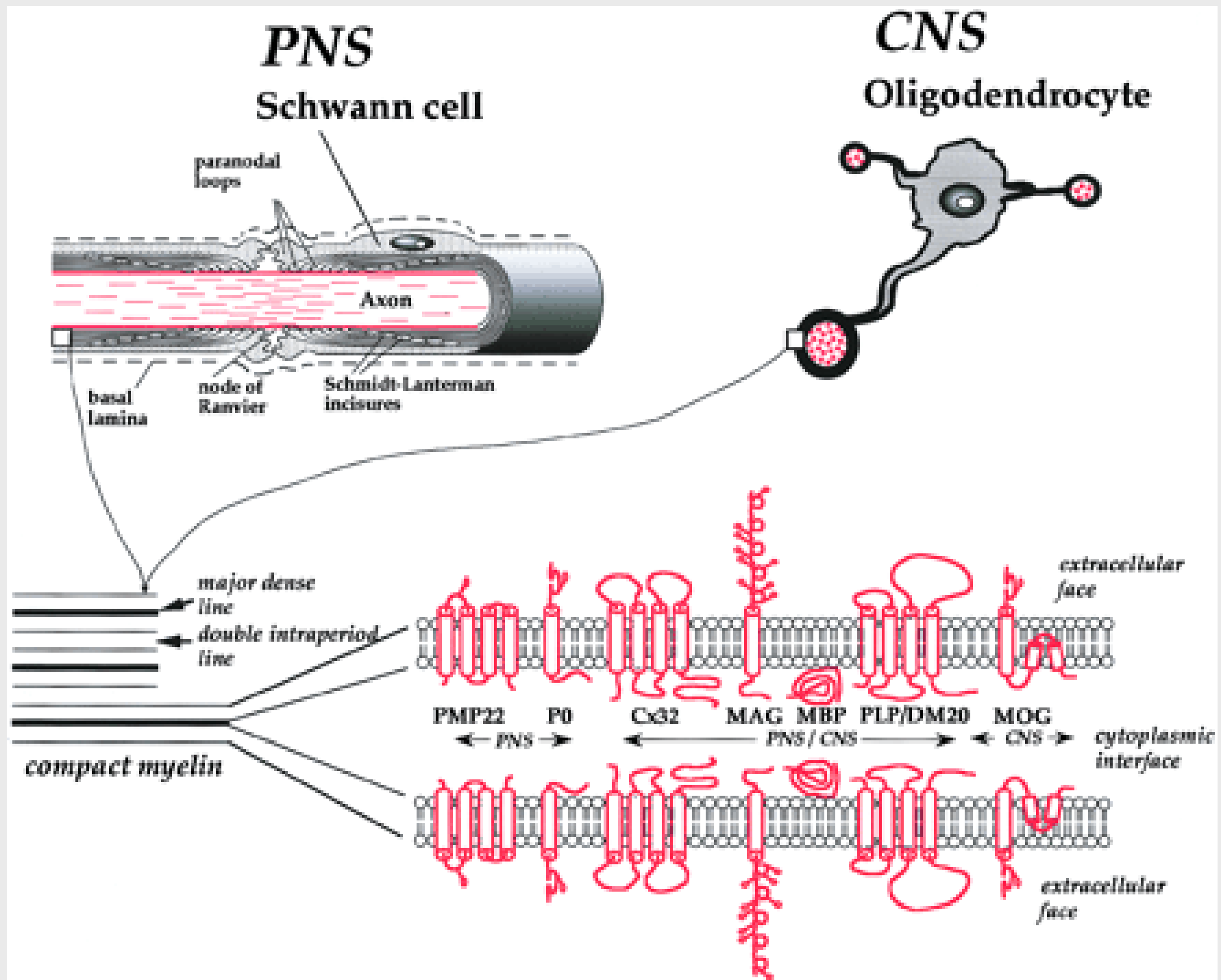


- **a | In the mouse spinal cord**, 85% of oligodendrocyte precursors are generated from pMN in the ventral ventricular zones (1), starting at about embryonic day (E)12.5. At about E15, generation of a secondary wave of precursors starts in more dorsal regions^{16, 17, 18} by trans-differentiation of radial glia¹⁸ (2).
- **b | In the telencephalon**, the ventral-most precursors in the medial ganglionic eminence are produced from about E12.5 (1), production of the lateral ganglionic eminence-derived precursors starts a few days later (2), and production of the cortex-derived precursors occurs mainly after birth¹⁹ (3).

Ventral origin of PDGFR α -positive oligodendrocyte precursors.

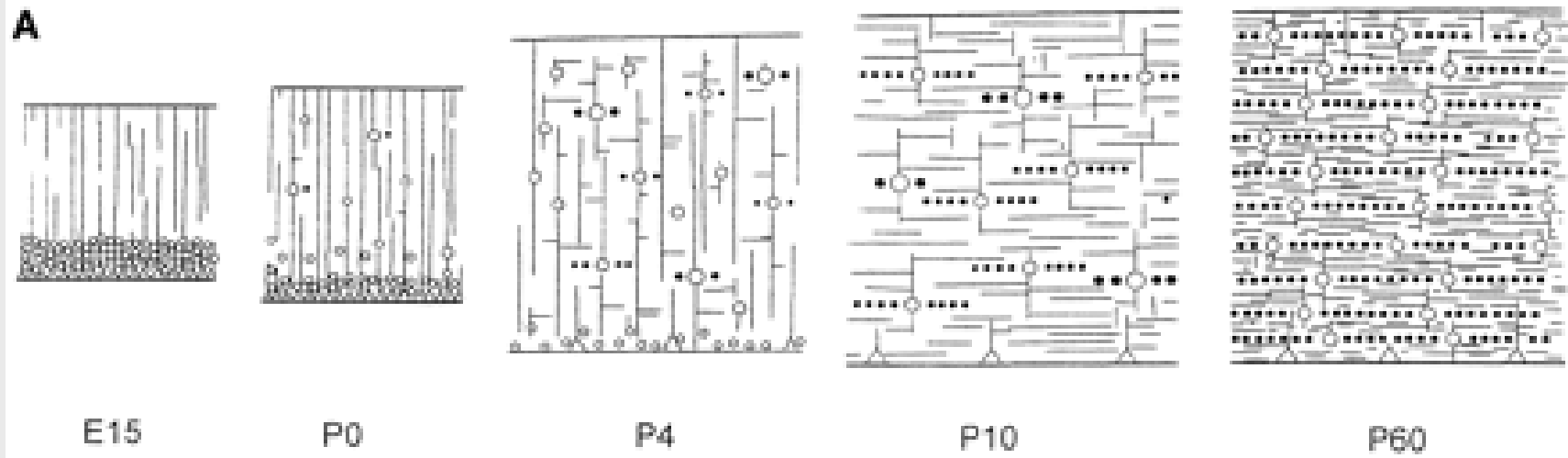


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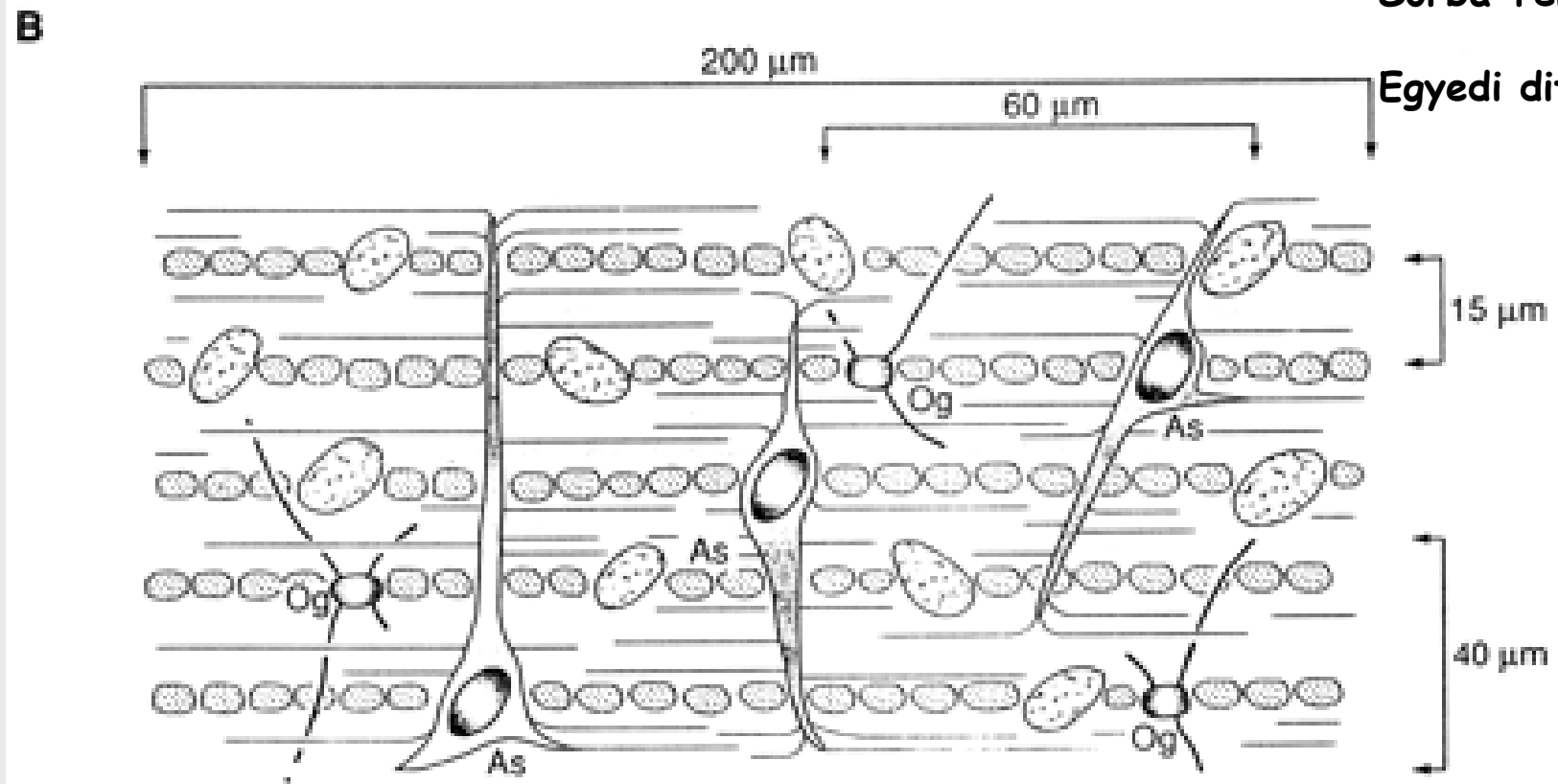
„Glia-hálózat” kialakulása

Fimbria-
formation



Sorba-rendeződés;

Egyedi differenciáció



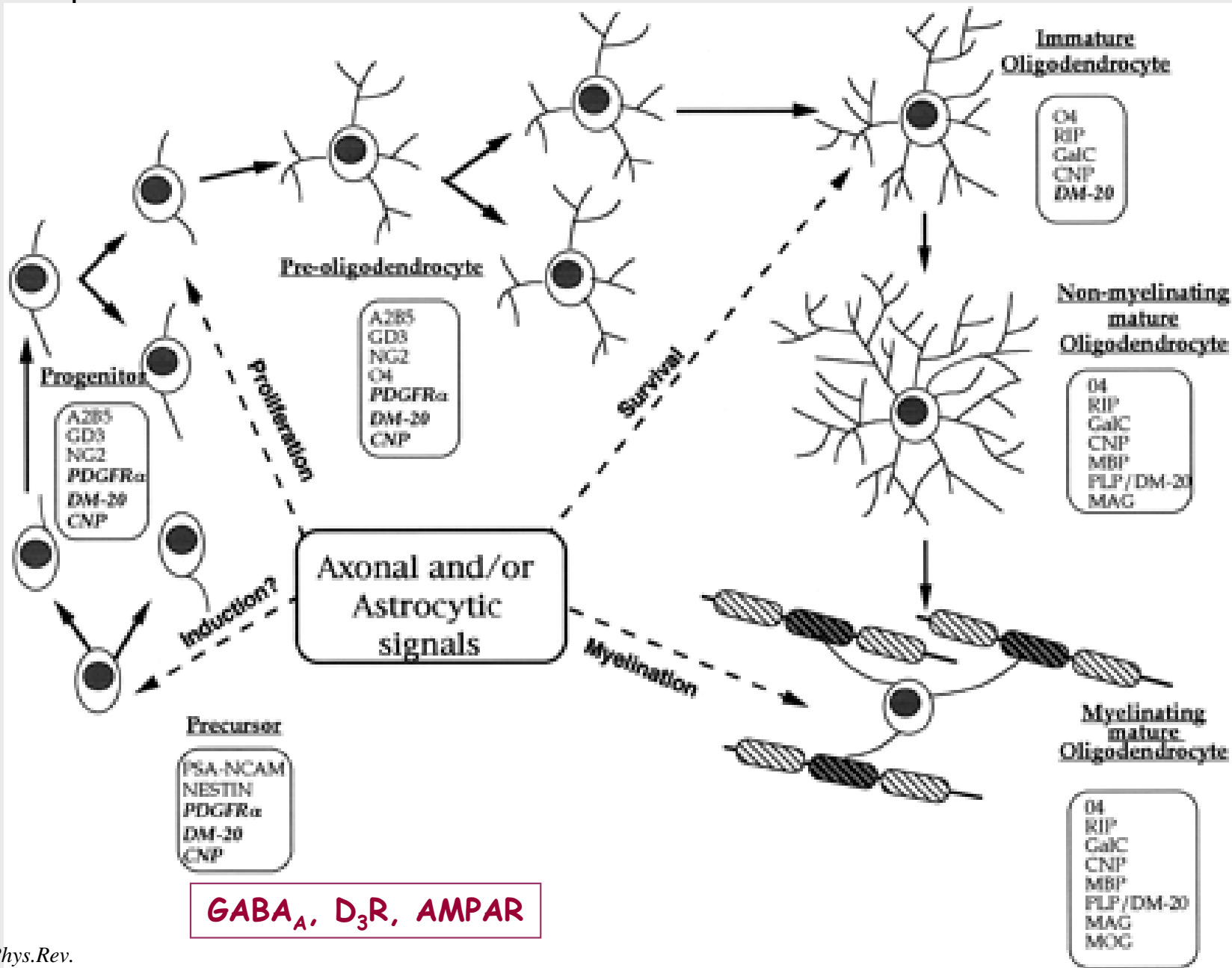
Oligo-progenitor markerek:

GD3 gangliozid
 NG2 kondroitin-szulfát proteoglikán,
 PDGF-alphaR

„Érett” oligo- markerek:

O4, MBP, PLP, MAG, MOgp, GalC,
 NogoA,

FGF2,
 PDGF
 CNTF,
 Neureg.
 (GGF)



NT3
 (TrkC):

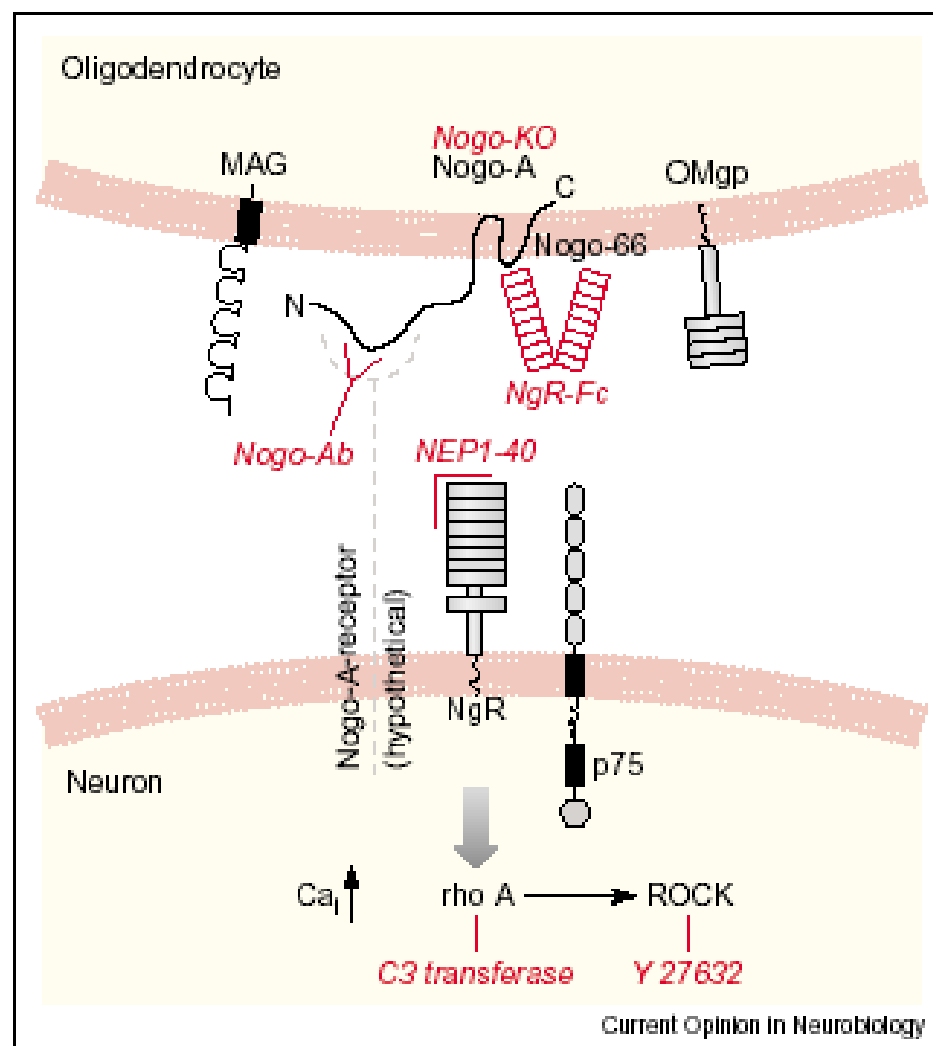
IGF-1

GABA_A, D₃R, AMPAR

Adhéziós szignál (guidance) molekulák

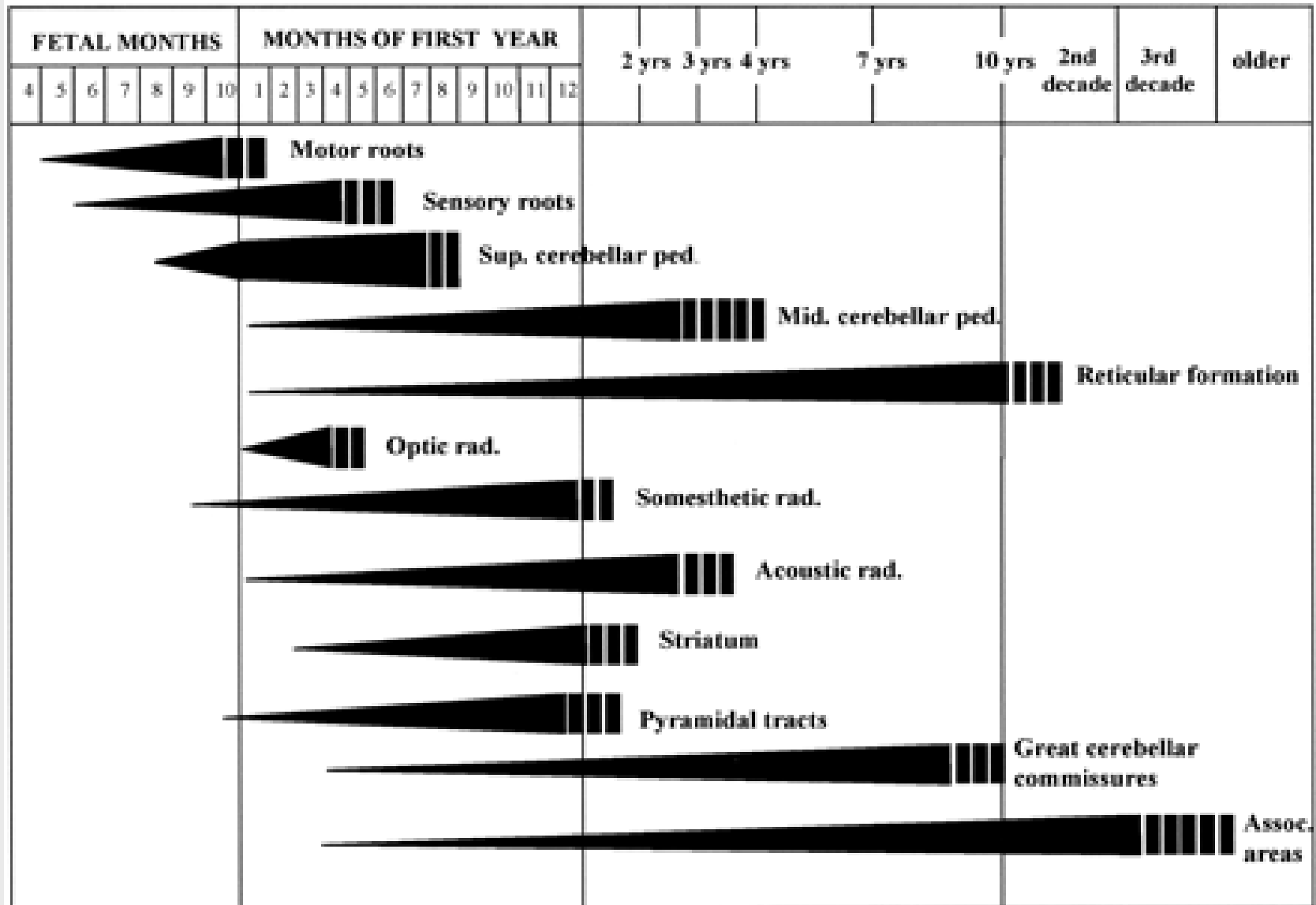
Receptor	Ligand	Letapadási jel
DCC/Unc5	Netrin	repulzív/attraktív Wadsworth, Hedgecock 1996
Robo	Slit	repulzív Wong et al., 2002
Neuropilin	Semaphorin	repulzív/attraktív Chen et al., 1998
Eph (Trk receptors)	Ephrin	repulzív/attraktív Himanen, Nikolov 2003
NogoR	MAG, Omgp, Nogo66	repulzív McGee, Strittmatter, 2003

SEMA I, II, VIII: gerinctelen; receptor: plexinek
 SEMA III-VII : gerinces; receptor: neuropilin 1 és 2



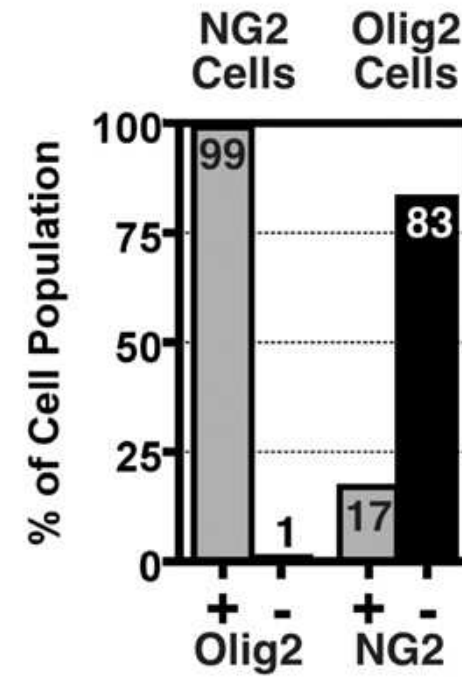
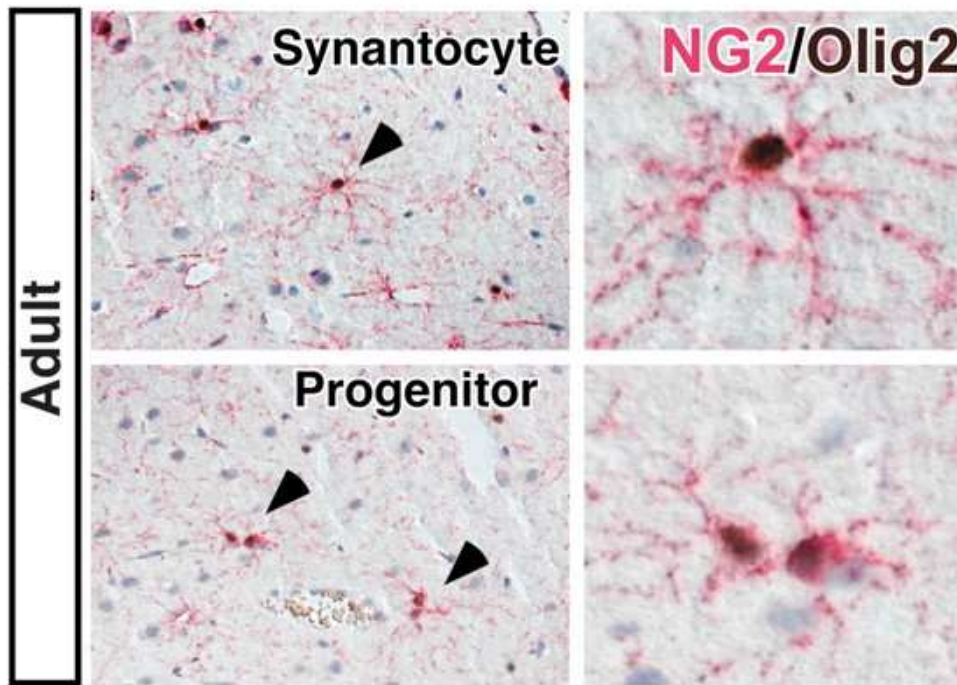
Nogo-A, MAG and OMgp, the principal inhibitors of neurite growth in CNS myelin, interact with a receptor complex comprising NgR, p75 and additional components. Methods of blocking Nogo and its actions are shown in red. As well as gene deletions (Nogo-KO), Nogo-A, which is shown with its two main active sites facing the extracellular space, can be neutralized by specific antibodies or by a soluble Nogo-66-binding fusion protein comprising domains of the receptor subunit NgR. The NgR subunit itself can be blocked by the NEP1-40 peptide derived from the first 40 amino acids of the Nogo-66 region of Nogo-A. As MAG and OMgp also bind to NgR, NEP1-40 may be a particularly potent reagent. Nogo-A and Nogo-66 activate Rho-A and its downstream target ROCK, the activity of which can be blocked by C3 transferase and the inhibitor Y27632, respectively.

Mielináció az emberi agy különböző régióiban



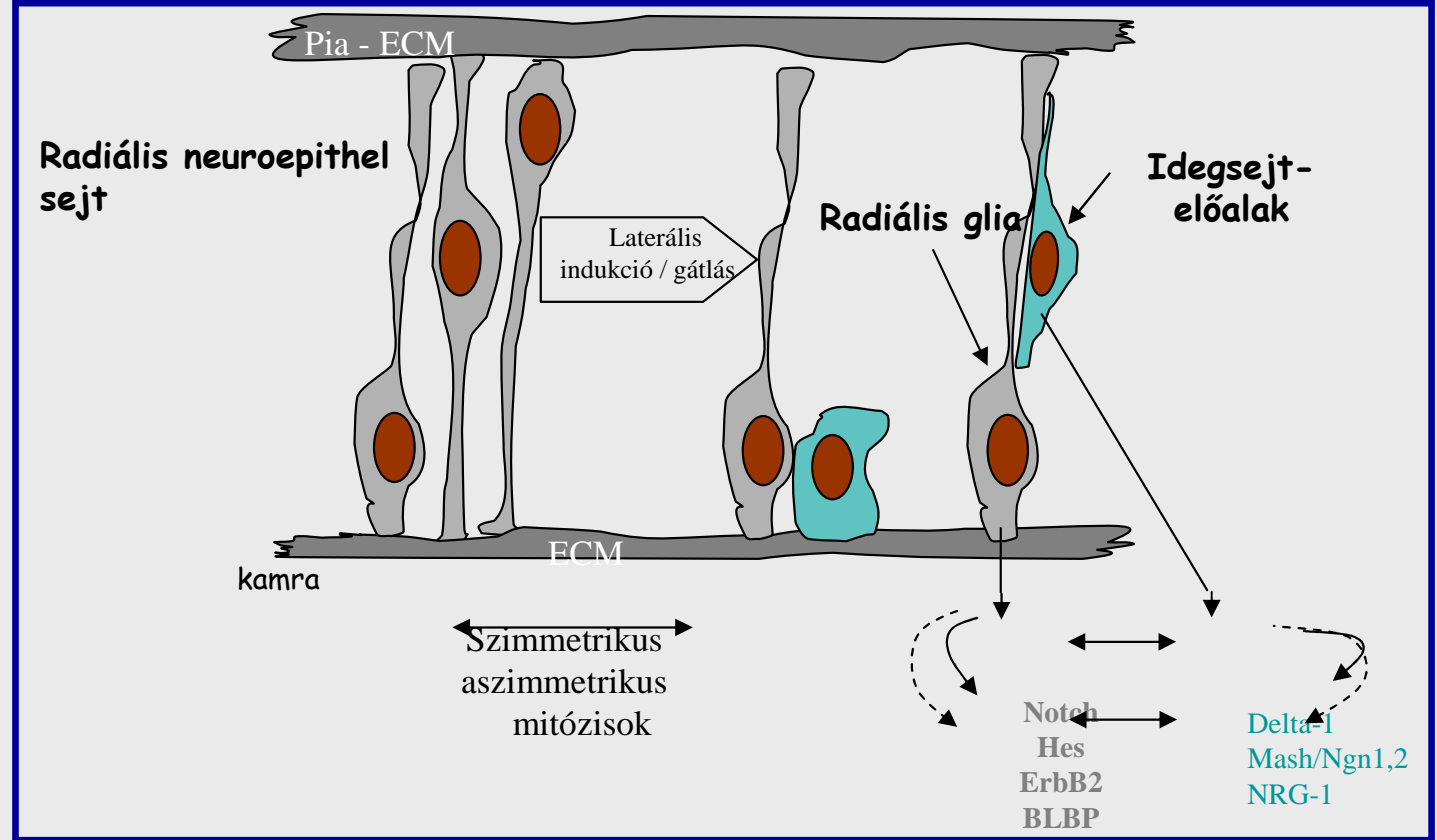
Poly-dendrociták

B



Korai embrionális állapot:

Neurális lemez állapottól a neurogenesis első nagy szakaszának lezajlásáig



Embrió-fötusz-újszülött állapot:

Neurális szövetgenesis;

Radiális glia

Szubventrikularis idegi őssejt/progenitor

Asztrocita

Ependyma sejt

Oligodendroglia-sejt

Újszülött - felnőtt:

O2A progenitor