

NEUROGLIAL AXONS

Jesús Vaquero-Crespo*

ABSTRACT

The author bases this work on findings which reveal a morphological similitude between neurons and glial cells and on the existence of neuroglial circuits in order to try to identify functionally some glial types with neurons of a short axon. This report adds some pictures showing anatomically the axon in neuroglial cells.

From the point of view of the classical Neurohistology the "T" division and the right angle one are criterion upon which is based the designation of a nerve cell prolongation as an axon.

In the last twenty years a large number of experimental works have been issued about the active participation of the glial cells in the neuronal metabolism, having even been appointed by Körnmüller¹ the possible role of these cells as sources of the macrorhythms of E.E.G. by means of a modulation of neuronal excitability through phenomena of rhythmic secretion.

Recently, Valenzuela y Chacón^{2,3} has exposed the Moderodense Theory of the neuroglia, pointing out morphological resemblance between the thorns of the neuronal dendrites and those present in neuroglial processes as well as the one existing between the terminal buttons of both cell types.

As a consequence of these appreciations, together with the existence of neuroglial circuits in the cerebellum and with the similarities existing in the enzymatic activity of these cell types this author comes to the conclusion that the astrocyte would work as a condenser inserted in the neuronal processes, moderating and storing up the transport of neurotransmitter particles as substrate of the nerve impulse. Nevertheless, up to now, there are no morphological evidences that would support that one of the glial processes could have an especialized function, different from the functions of the others.

* Villamil 31, Madrid-29, España.

If we accept the idea held by Lorent de No⁴ that the delicacy of the Nervous System function is proportional to the amount of short axon neurones present in it and there exist some morphofunctional data showing the neuroglial cooperation in the nerve impulse transmission, we come to the final question about the possibility of identifying neuroglial cell and short axon neuron.

In order to help work out this problem our objective must be the search of astrocyte processes that could be considered morphologically as axons. This communication present some evidences of neuroglial axons in the Nervous System of the dog aged under three months with the Golgi-Valenzuela technique.

ACKNOWLEDGEMENT

I thank my colleague De Antonio his help in translating this communication.

Axones neurológicos.

Vaquero-Crespo J (Villaamil 31, Madrid-29, España). *Invest Clin* 14(4): 191-193, 1973.- El autor se basa en hallazgos que revelan una similitud morfológica entre neuronas y células gliales así como en la existencia de circuitos neuróglícos para tratar de identificar funcionalmente algunos tipos gliales con neuronas de axon corto. Esta comunicación aporta algunas imágenes con la demostración anatómica de axon en células neuróglícas.

REFERENCES

- 1- KORN MULLER AE: Zum Wesen der Epilepsie aut Grund einer Analyse des E.E.G. *Fortschr. Neurol Psychiat* 26: 470, 1958.
- 2- VALENZUELA Y CHACON J: Etude histochemique et histologique de la néuroglie du cerveau. Descriptions des prolongements épineux de la néuroglie et des boutons terminaux et leur participation dans l'influx nerveux. *Acta Histochem* 35: 220-232, 1970.
- 3- VALENZUELA Y CHACON J: *Neuroglia*. Marbán, ed. Madrid, 1970.
- 4- VAQUERO-CRESPO J: Estudio anatómico de la organización neuróglíca de la médula espinal. Memoria presentada a la Real Academia de Medicina. Granada, España. 1972.

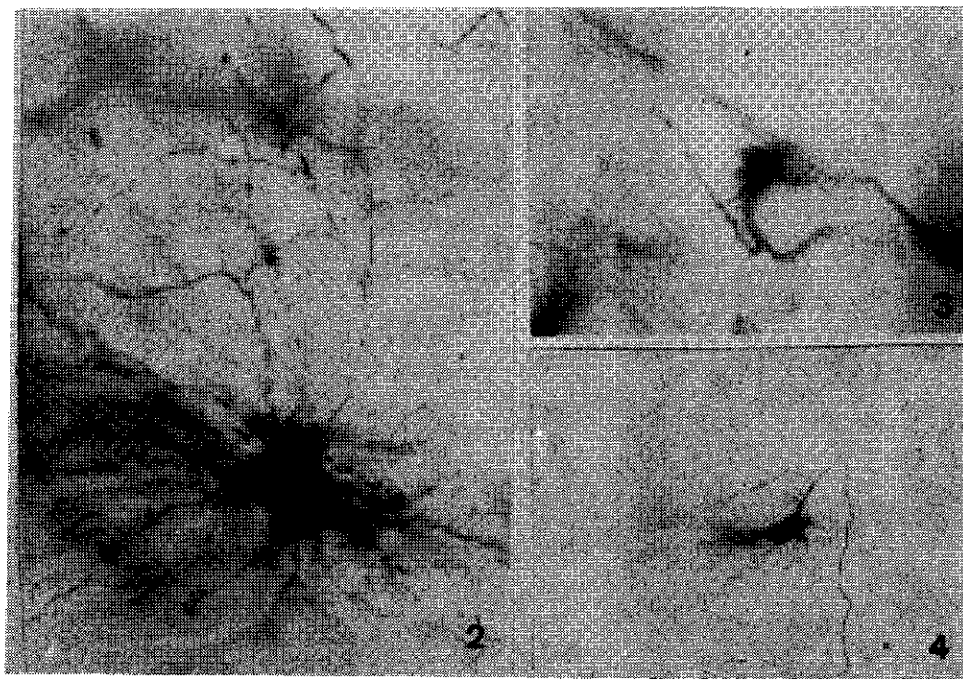
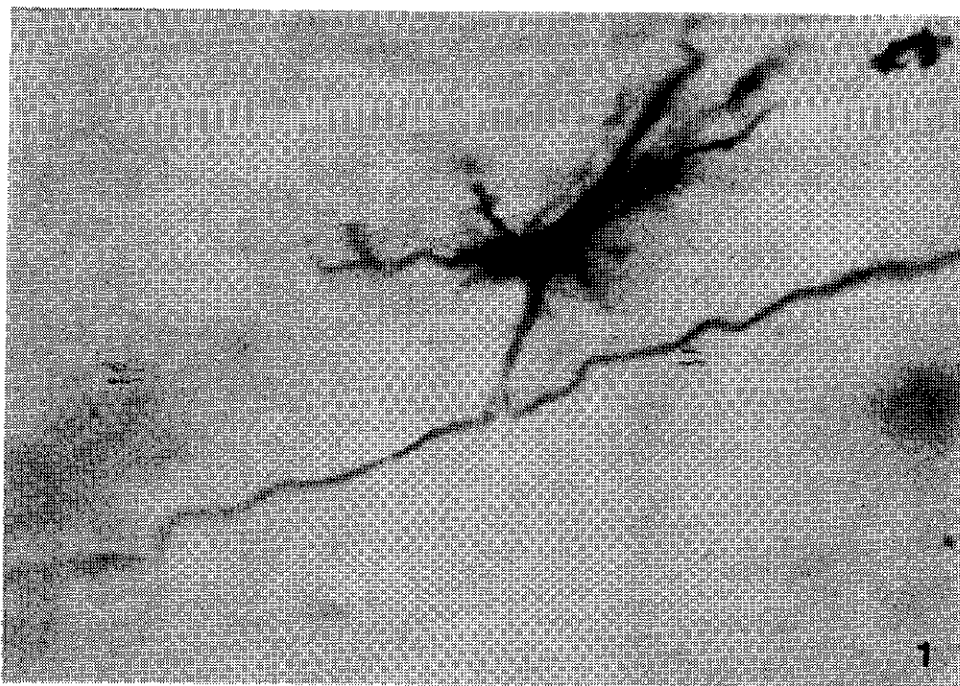


Fig. 1.— Fasciculus lateralis astrocyte of the spinal cord.

Fig. 2.— Fibrous cerebellum astrocyte whose process divides in T.

Fig. 3.— Periependymary glial cell showing a "T" divided process.

Fig. 4.— Whitematter glial cell with process from which spring colaterals in right angle.