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OC-079 - (23944) - 3D MORPHOLOGICAL ANALYSIS OF THE GOLGI APPARATUS IN SPINAL GANGLION CELLS BY SERIAL SECTION SEM

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The Golgi apparatus was first discovered by Camillo Golgi in neurons, including spinal ganglion and cerebellar Purkinje cells. Since then, numerous studies on the structure of the Golgi in spinal ganglion cells have been performed using light and transmission electron microscopy. However, the three-dimensional (3D) organization of this organelle in the ganglion cells remains unclear.

Adult Wistar rats were used in the present study. Serial ultrathin sections of dorsal root ganglia embedded in epoxy resin were cut with a diamond knife using an ultramicrotome, mounted on glass microscope slides, and observed under an ultra-high resolution scanning electron microscope (SEM). The 3D reconstruction models were created from serial tomographic images of the Golgi apparatus in ganglion cells, obtained using backscattered electron-mode SEM.

At least three types of neurons are present in the dorsal root ganglia: large, smaller, and smallest neurons. Using serial section SEM, we clarified the 3D morphological characteristics of the Golgi apparatus in these neurons, which consisted of a ribbon-like structure surrounding the nuclei. However, the Golgi ribbons in all types of spinal ganglion cells were discontinuous unlike those in many other mammalian cells. Notably, this result contrasted with the 3D configuration of the Golgi apparatus in Purkinje cells, another type of neuron, in which a continuous ribbon structure is observed, as shown in our previous studies.

Here, we introduce the 3D structure of the Golgi apparatus in spinal ganglion cells, as revealed by fluorescence imaging and the osmium maceration method as well as serial section SEM.

Palavras-chave : The Golgi apparatus, Serial section SEM, 3D