

How Golgi Shared the 1906 Nobel Prize in Physiology or Medicine with Cajal

by [Gunnar Grant*](#)

September 12, 1999



[Camillo Golgi](#) was nominated for the Nobel Prize in Physiology or Medicine as early as 1901, when the first prize was awarded. After that, his name came up every year until 1906, when he was finally awarded the prize together with [Santiago Ramón y Cajal](#).

There were four proponents for Golgi that year, namely Hertwig, professor of comparative anatomy from Berlin, Kölliker, professor of anatomy from Würzburg, and two Swedes, Gustaf Retzius, former professor of anatomy from Stockholm, and Carl Magnus Fürst, professor of anatomy from Lund. Kölliker, Retzius and Fürst proposed Golgi and Cajal. Retzius, however, proposed Cajal alone as an alternative. Cajal's nomination was also supported by, in addition, Ziehen, professor of psychiatry and neurology from Berlin, and by Emil Holmgren, from Stockholm.

Kölliker had proposed Golgi in 1901. He nominated him again in 1905 and then, as in 1906, he proposed both Golgi and Cajal. Retzius sent in proposals for Golgi all the five years from 1902. The first three times he proposed Golgi and Cajal, but in 1905 he nominated Cajal, and after him, Golgi. Finally, as mentioned, in 1906 his suggestion was for Golgi and Cajal, or Cajal alone.



The Royal Caroline Medico-Chirurgical Institute (Kongl. Carolinska Mediko-Chirurgiska Institutet; today known as Karolinska Institutet) at Kungsholmen, close to the present City Hall in Stockholm, around 1900. Located in Solna since the mid-40s.

It may be of some interest that, in 1902, Emil Holmgren, professor of histology at the [Caroline Institute](#) in Stockholm, had been one of the proponents in favor of Golgi. It was Holmgren who was commissioned by the Nobel Committee to carry out the investigation on Golgi's and Cajal's work and to write the reports for all the five years from 1902, until the time they were awarded the prize in 1906.

The comprehensive report by Holmgren in 1906, corresponding to nearly 50 type-written pages of size A4 paper, was based on a careful and extensive analysis of the merits of the two candidates, who were also weighed against each other. Holmgren's conclusion was the following (translation from Swedish by G.G.): "If the achievements by Golgi, on the one hand, and Cajal, on the other, in the research on the nervous system are considered, one can not, in justice, evade the final conclusion that Cajal is far superior to Golgi." It may be noted that this was his conclusion during the later years. In his report, Holmgren made it clear that he would have given Golgi a higher priority if it had been some years earlier. Now, however, according to Holmgren, Cajal had made such important and principally valuable discoveries, and also interpreted his findings in a correct way, as had been confirmed by others. Because of this, Holmgren was predisposed to rank Cajal before Golgi.

Favouring Cajal over Golgi, Holmgren writes (translation from Swedish by G.G.): "Cajal has not served science by singular corrections of observations by others, or by adding here and there an important observation to our stock of knowledge, but it is he who has built almost the whole framework of our structure of thinking, in which the less fortunately endowed forces have had to, and will still have to put in their contributions."

Holmgren's evaluation included Cajal's more recent contributions based on his neurofibrillar impregnation method, both for a better understanding of the interior of the nerve cell and for studies of regeneration of peripheral nerve fibers - which had also been studied by Perroncito in Pavia, a pupil of Golgi - as well as for studies of outgrowth of axons during the embryonic development, demonstrating end bulbs (growth cones). These formed part of the basis for his support for Cajal's scientific superiority.

Regarding Golgi, Holmgren discussed some of the findings which had turned out to be wrong. The most important of these were Golgi's adherence to the reticular theory, against which the neuron doctrine had been put forward and gained acceptance by most neuroscientists during this period. Further to this was Golgi's view on the dendrites, which he regarded as nutritive elements for the neurons and not involved in the conduction of impulses, as well as his view on his type II cells, which he suggested to be involved in sensory function, sending axons out from the central nervous system to the periphery, on the sensory side.

Carl Sundberg, professor of pathology at the Caroline Institute, who was also Vice President at the Institute at that time, was thereupon asked for another evaluation of the candidates, after Holmgren's conclusions had become known to members of the Nobel Committee. Contrary to Holmgren's conclusions, Sundberg, for his part, put more stress upon Golgi's valuable contributions, citing not only the development of the Golgi method but also, for instance, his findings of collaterals both in the gray matter and in the longitudinally running white columns of the spinal cord. He tried to soften the weak points in Golgi's contributions and quoted passages from evaluations done by Holmgren during the earlier years that were in support of Golgi.

Before the final decision was taken on October 25th, written opinions were expressed both by Holmgren and Sundberg, and in addition, by Bror Gadelius, professor of psychiatry at the Caroline Institute. Gadelius supported Holmgren's views.

The final voting among the professors at the Institute resulted in a majority for a Nobel Prize shared by Golgi and Cajal. Only two were against - their names were not given, but it should not be difficult to guess who they were.

Of some interest may also be Gustaf Retzius' view on the decision that was taken. This is expressed in a passage in his autobiography (1948, p. 246; translation by G.G. - italics also in the Swedish text): "... Cajal...But it is true that already at his arrival in Stockholm, I thought that he had deserved receiving a *full*, and *undivided* Nobel Prize, and asked about this by the Nobel Council of the staff of professors at the Caroline Institute, I expressed this opinion of mine *decidedly*."

That Retzius was asked for his opinion but did not take part in the decision, is explained by the fact that he was no longer a member of the Medical Faculty at the Caroline Institute. He had resigned from his chair in anatomy in 1890, in protest over the failure to get his candidate appointed to a professorship in ophthalmology. Paradoxically, however,

his membership both in the [Royal Swedish Academy of Sciences](#) and in the [Swedish Academy](#), meant that he took part in the election of the Laureates both in Physics and Chemistry, and in Literature.

Going back to the nominations, this was the first time that the Nobel Prize was shared between two Laureates. Cajal writes about this (from the English translation of his autobiography, 1989, p. 546): "The other half was very justly adjudicated to the illustrious professor of Pavia, Camillo Golgi, the originator of the method with which I accomplished my most striking discoveries."

Acknowledgements

Material from the Nobel Archives was kindly provided by the Nobel Committee for Physiology or Medicine.

Permission to reproduce the lecture given at the Golgi and Bizzozero symposium was given by the Giornale dell'Accademia di Medicina di Torino.

References

Ramón y Cajal S (1989) *Recollections of my life*; translated by E. Horne Craigie, with the assistance of Juan Cano. Cambridge, Massachusetts, The MIT Press, 638 pp.

Retzius, G (1948) *Biografiska Anteckningar och Minnen*, vol. II. Uppsala, Almqvist & Wiksell AB, 285 pp.

*This article is based in part on a lecture entitled "Camillo Golgi and the Nobel Prize", given at a symposium entitled "Golgi and Bizzozero nel centenario della scoperta dell'apparato reticolare interno" at the Accademia di Medicina di Torino, Italy, November 24, 1998. Original information was achieved from the archives of the Nobel Committee for Physiology or Medicine after a formal request by the author to get access to these archives.