GOLGI and CAJAL'S VISIONS 120 YEARS LATER

One hundred and twenty years ago, On December 11 1906, in the Royal Academy of Music of Stockholm, King Oscar II presented the Nobel Prize in Physiology or Medicine to Camillo Golgi (1843-1926) and Santiago Ramón y Cajal (1852-1934) "in recognition of their work on the structure of the nervous system".

Golgi developed a staining method that allowed an unprecedented visualization of brain cells, and used it to unveil the organization of the brain; and Cajal, using that method, pursued the titanic challenge of studying the brain of numerous species, its development and the effects of lesions, paving the way for all subsequent studies of the brain. Both scientists produced spectacular drawings of brain cells, but interpreted quite differently their results. Golgi proposed that the brain was a diffuse network of interconnected cells (reticular theory), whereas Cajal posited that the brain is made of individual neurons that are the anatomical, functional, metabolic, genetic, and pathological units (neuron doctrine), a view that forged modern neuroscience. These different visions of the brain generated some tension between the two scientists, and culminated in the so-called "Stockholm confrontation" at the 1906 Nobel ceremony.

To commemorate the 120th anniversary of the Nobel to Golgi and Cajal, the European Brain Research Institute Rita Levi-Montalcini and the Embassy of Spain in Italy are organizing the Encuentros Cajal Italy, with the aim of discussing how their visions have evolved. Following an historical reconstruction of the life and the contributions of Golgi and Cajal, we shall discuss how the discovery of electrical synapses opened a new field that culminated with the discovery that numerous neurons are interconnected by gap junctions, thus indicating that they are no longer dogmatically separate units. We shall then discuss the role of glial cells, in particular of astrocytes, that sense and release neurotransmitters and form real syncytia that modulate distant synapses. What appears notable is that the visions of Golgi and Cajal retain an ongoing relevance, and are influencing contemporary research on the pathophysiology of many invalidating diseases.

"Even more appealing than virgin forest was the jungle lying before me at that moment: the nervous system, with its billions of cells gathered in populations each different from the other and all locked into the apparently inextricable nets of the nervous circuits which intersect in all directions along the cerebrospinal axis. The pleasure I was already savoring in anticipation was enhanced by the prospect of carrying out the project under the conditions contingent on the prohibitive racial laws. If Ramón y Cajal, with his giant's step and exceptional intuition, had dared foray into that jungle, why should I not venture along the path he had opened for me?"

Levi-Montalcini, R. 1988.
In Praise of Imperfection.
Basic Books, New York, p. 90

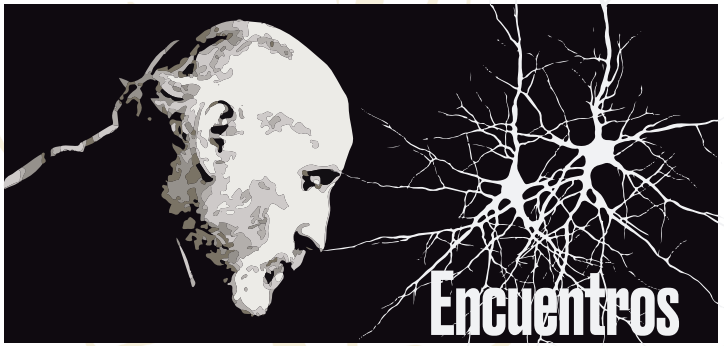
Registration is required to partecipate *LINK*

MEETING SECRETARIAT: scientific.assist@ebri.it

EBRI
European Brain Research Institute
Rita Levi-Montalcini

Embajada de España en Italia

España Cultura Viva



GOLGI AND CAJAL'S VISIONS 120 YEARS LATER

11 December 2026

ROME

Sala Convegni - Consiglio Nazionale delle Ricerche CNR
Via dei Marrucini

PROGRAMME

9:30

Registration

10:00

WELCOME ADDRESSES

Eugenio Gaudio
President, European Brain Research Institute 'Rita Levi-Montalcini'

Caridad Batalla
Cultural Counselor, Embassy of Spain in Rome

Andrea Lenzi
President, Consiglio Nazionale delle Ricerche

SETTING THE SCENE

CHAIR: **Gilberto Corbellini**

10:30

CAMILLO GOLGI: A LIFE IN SCIENCE
Paolo Mazzarello
Università di Pavia

11:10

CAJAL AND THE NEURON DOCTRINE VERSUS THE RETICULAR THEORY
Javier DeFelipe
Instituto Cajal (CSIC) Madrid

RELEVANT ADVANCES 1906-2026

CHAIR: **Fiorenzo Conti**

GAP JUNCTIONS, INTERNEURONAL ELECTRICAL SYNAPSES & THEIR FUNCTIONAL ROLE

11:50

COMPUTING WITH ELECTRICAL SYNAPSES: IMPLICATIONS FOR NEURONS AND NEURAL NETWORKS
Pepe Alcamí
University of Munich; Max Planck Institute for Biological Intelligence, Seewiesen

12:30

LONG-LIVED YET PLASTIC: CORTICAL GAP JUNCTIONS IN INHIBITORY NEURONS
Hannah Monyer
European Brain Research Institute 'Rita Levi-Montalcini'; German Cancer Research Center, DKFZ, Heidelberg

13:10

Break

ASTROCYTES AND ASTROCYTIC NETWORKS

14:10

TRIPARTITE SYNAPSES: ASTROCYTE REGULATION OF SYNAPTIC TRANSMISSION, CIRCUIT FUNCTION AND BEHAVIOR
Alfonso Araque
Medical School, University of Minneapolis, USA

14:50

CAJAL, GOLGI AND THE ASTROCYTE NETWORK: FROM CELLULAR UNITS TO FUNCTIONAL ENSEMBLES
Marta Navarrete
Centro de Neurociencias Cajal – CSIC, Alcalá de Henares

15:30

Coffee Break

IMPLICATIONS FOR THE FUTURE

CHAIR: **Enrico Alleva**

16:00

STRATEGIES TO RESTORE SYNAPTIC PLASTICITY IN NEURODEGENERATIVE DISEASES
Paolo Calabresi
Università Cattolica del Sacro Cuore, Rome

16:40

MYSTERIES OF TROPHIC FACTORS AND NEURODEGENERATION
Moses Chao
NYU Langone Medical Center, USA