

*Scientific conference*

**DECEMBER  
20<sup>th</sup> 2019**

# Spreading the bad news: an update on the role of pathological proteins in neurodegenerative diseases

*XXX OTTORINO ROSSI AWARD  
NEW SERIES "THE PAVIA LEGACY"*

**IRCCS Mondino Foundation**

Pavia, via Mondino 2, Berlucci Hall

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**FONDAZIONE  
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Istituto Neurologico Nazionale  
a Carattere Scientifico | IRCCS

Sistema Sanitario  Regione  
Lombardia

Ottorino Rossi was born on 17<sup>th</sup> January, 1877, in Solbiate Comasco, near Como, Italy. In 1895 he enrolled at the medical faculty of the University of Pavia as a student of the Ghislieri College and during his undergraduate years was an intern pupil of the Institute of General Pathology and Histology, headed by Camillo Golgi. In 1901 Rossi obtained his medical doctor degree with the highest grades and a distinction. In October 1902 he went on to the Clinica Neuropatologica (Hospital for Nervous and Mental Diseases) directed by Casimiro Mondino to continue his studies. At the same time, he continued to frequent the Golgi Institute which was the leading Italian centre for biological research. Having completed his clinical preparation in Florence under Eugenio Tanzi, and in Munich at the Institute directed by Emil Kraepelin, he taught at the Universities of Siena, Sassari and, from 1925, Pavia. In Pavia he was made Rector of the University (serving from 1925 to 1936), and during his tenure he

was instrumental in getting the buildings of the new San Matteo General Hospital completed.

Ottorino Rossi made many important scientific contributions to the fields of neurology, neurophysiopathology and neuroanatomy. These include: the identification of glucose as the reducing agent of cerebrospinal fluid, the demonstration that fibres from the spinal ganglia pass into the dorsal branch of the spinal roots, and the description of the cerebellar symptom which he termed "the primary asymmetries of positions". Moreover, he conducted important studies on the immunopathology of the nervous system, the serodiagnosis of neurosyphilis and the regeneration of the nervous system. He was the author of major scientific works including an extensive investigation of arteriosclerosis in the brain, *L'Arteriosclerosi dei Centri Cerebrali e Spinali* (1906), which dealt with the development of lesions of vascular

origin. He died in 1936 at the age of 59, having named the Ghislieri College as his heir. Ottorino Rossi was one of Camillo Golgi's most illustrious pupils as well as one of the most eminent descendants of Pavia's medico-biological tradition.

Since 1990, thanks to an initiative launched by the Scientific Director at the time (Prof. Giuseppe Nappi), the IRCCS Mondino Foundation has held an annual conference at which an award dedicated to the memory of Ottorino Rossi is presented to a scientist who has made an important contribution to research in the field of the neurosciences.

Recent years have seen the introduction of a new Ottorino Rossi Award series, aimed at rewarding eminent researchers with cultural and scientific links with the city of Pavia. Having been informally started in 2017, on the occasion of the centenary of the Mondino Foundation, this new series was officially inaugurated in 2018, under the heading "The Pavia legacy".

## Adriano Aguzzi / Ottorino Rossi Award 2019

Adriano Aguzzi was born in Pavia in 1960. After graduating from high school, he moved to the University of Freiburg, Germany, where he obtained his MD degree in 1986. Following postdoctoral studies in Vienna, he received the *venia legendi* in neuropathology at the University of Zurich in 1993, where he is currently Full Professor of Neuropathology, Director of the Institute of Neuropathology and Chairman of the Interfaculty MD-PhD Committee.

Adriano Aguzzi has devoted his career to studying the immunological and molecular basis of human prion diseases, a group of fatal neurodegenerative conditions characterized by neuronal loss, vacuolation and glial activation. He is both founder and Director of the Swiss National Reference Center for Prion Diseases and has developed diagnostic and therapeutic methods in the field of transmissible spongiform encephalopathies. He invented the first

*in vivo* model of microglia depletion, which helped to show the vigorous anti-prion activity of microglia. Aguzzi's work led to the identification of the cell types and molecules that enable invasion of the brain by prions, and highlighted the role of follicular dendritic cells as the "prion factories" in extracerebral tissues. He identified plasminogen as a prion carrier in blood, and improved the process of differentiation of prion strains by fluorescence spectroscopy. Aguzzi's lab also found that prion protein of neuronal origin prevents demyelination, thus highlighting a possible physiological role of this protein, and therefore the potential existence of new therapeutic targets. Through his pioneering work, Adriano Aguzzi has made a highly original and fundamental contribution to research into prion diseases, and become a towering figure in the field of modern neuroscience. His studies have revealed the cells and molecules involved in prion



neuroinvasion and the mechanisms that cause brain damage in these conditions, while critically analyzing whether and how such mechanisms may be shared by neurodegenerative diseases more frequent in the general population. The Ottorino Rossi Award 2019 is therefore bestowed on Prof. Adriano Aguzzi in recognition of his relentless investigation into the most intimate mechanisms of neurodegeneration, and thus for his outstanding contribution to the advancement of neuroscience.

## Previous Winners / Ottorino Rossi Award

- 1990**  
**Vittorio Erspamer**  
*Rome (Italy)*
- 1991**  
**Paolo Pinelli**  
*Milan (Italy)*
- 1992**  
**Giovanni Di Chiro**  
*Bethesda (USA)*
- 1993**  
**Clarence Joseph Gibbs**  
*Bethesda (USA)*
- 1994**  
**David Zee**  
*Baltimore (USA)*
- 1995**  
**Elio Lugaresi**  
*Bologna (Italia)*
- 1996**  
**Michel Fardeau**  
*Paris (France)*
- 1997**  
**Salvador Moncada**  
*London (UK)*
- 1998**  
**Alain Berthoz**  
*Paris (France)*
- 1999**  
**Ottar Sjaastad**  
*Trondheim (Norway)*
- 2000**  
**John Timothy Greenamyre**  
*Atlanta (USA)*
- 2001**  
**Salvatore Di Mauro**  
*New York (USA)*
- 2002**  
**Elio Raviola**  
*Boston (USA)*
- 2003**  
**Michael Welch**  
*Chicago (USA)*
- 2004**  
**François Boller**  
*Paris (France)*
- 2005**  
**Jes Olesen**  
*Copenhagen (Denmark)*
- 2006**  
**Stanley Finger**  
*S. Louis (USA)*
- 2007**  
**Michael A. Moskowitz**  
*Boston (USA)*
- 2008**  
**Patricia Smith Churchland**  
*San Diego (USA)*
- 2009**  
**Stephen P. Hunt**  
*London (UK)*
- 2010**  
**Vincenzo Bonavita**  
*Naples (Italy)*
- 2011**  
**Cesare Fieschi**  
*Rome (Italy)*
- 2012**  
**Giorgio Bernardi**  
*Rome (Italy)*
- 2013**  
**Henry Markram**  
*Lausanne (Switzerland)*
- 2014**  
**Emmanuele A. Jannini**  
*LAquila (Italy)*
- 2015**  
**Roberto Crea**  
*Hayward (USA)*
- 2016**  
**Richard Stanislaus Joseph Frackowiak**  
*Lausanne (Switzerland)*
- 2017**  
**Pierluigi Nicotera**  
*Bonn (Germany)*
- 2018**  
**Gianvito Martino**  
*Milan (Italy)*



## Background to the conference

This conference will address the role of pathological proteins in the pathogenesis, pathophysiology and clinical evolution of major neurodegenerative diseases, such as Alzheimer's disease, Parkinson's disease and the clinical spectrum that includes amyotrophic lateral sclerosis and frontotemporal dementia. This is currently a key area of research in the field of neurodegeneration, sparked, in recent years, also by the groundbreaking work on the molecular basis and cell biology of prion diseases done by the winner of the 30th Ottorino Rossi Award.

Distinct proteins — such as  $\beta$ -amyloid, tau,  $\alpha$ -synuclein and TDP-43 — may follow similar patterns of cell-to-cell transfer

and intracellular aggregation. By sowing the pathology among still unaffected neuronal populations, they have the effect of “spreading the bad news” throughout the areas of the central nervous system affected by the above-mentioned diseases.

Gaining a deeper insight into the intrinsic mechanisms governing these dynamics, and learning how the spread of pathological proteins can affect the clinical manifestations and evolution of these diseases, is central to the development of innovative therapeutic strategies targeting these proteins. Equally crucial is the availability of reliable neuroimaging techniques able, for diagnostic purposes and for the monitoring of disease pro-

gression, to detect the presence and topographical distribution of these proteins in the brain.

The conference format will reflect this conceptual framework. There will be three lectures per topic area, which will illustrate the state of the art with regard to pre-clinical research, clinical correlates and therapeutic implications, and advanced neuroimaging.

8.45 Registration and welcome coffee

9.30 Greetings from the Authorities

## **XXX OTTORINO ROSSI AWARD CEREMONY**

9.45 Presentation of the Winner

Lecture by the Winner

10.00 *The peculiar, fascinating biology  
of mammalian prions*

Adriano Aguzzi (Zurich)

## **CONFERENCE**

**SPREADING THE BAD NEWS: AN UPDATE  
ON THE ROLE OF PATHOLOGICAL PROTEINS  
IN NEURODEGENERATIVE DISEASES**

### ■ **ALZHEIMER'S DISEASE**

*Chairpersons:* Stefano Cappa (Pavia)  
Fabrizio Tagliavini (Milan)

11.00 *Oligomers: disease spreading and toxicity*  
Gianluigi Forloni (Milan)

11.35 *Clinical relevance of neuropathological  
changes in Alzheimer's disease*  
Alessandro Padovani (Brescia)

12.10 *Tau, A $\beta$  and network degeneration  
in Alzheimer's disease*  
Rik Ossenkoppele (Amsterdam)

12.45 Lunch

## ■ **PARKINSON'S DISEASE**

**Chairpersons:** Fabio Blandini (Pavia)  
Antonio Pisani (Rome)

13.45 *Alpha-Synuclein: a troublesome traveller*  
Donato A. Di Monte (Bonn)

14.20 *Clinical evolution in Parkinson's disease  
and the spread of pathology:  
insights from the GBA story*  
Anthony H. Schapira (London)

14.55 *Body-first vs brain-first Parkinson's  
disease: visualised by multi-modality  
imaging*  
Per Borghammer (Aarhus)

## ■ **AMYOTROPHIC LATERAL SCLEROSIS (ALS) AND FRONTOTEMPORAL DEMENTIA (FTD)**

**Chairpersons:** Mauro Ceroni (Pavia)  
Andrea Malaspina (London)

15.30 *Mechanism of aggregation, seeding  
and toxicity in ALS and FTD*  
Magdalini Polymenidou (Zurich)

16.05 *The clinical relevance of contact-  
dependent/independent cell-to-cell transfer  
of TDP-43 and SOD1 in ALS/FTD*  
Vincenzo Silani (Milan)

16.40 *A new perspective for advanced  
PET-based molecular imaging  
in FTD spectrum*  
Daniela Perani (Milan)

## 17.15 **CONCLUDING REMARKS**

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### **Scientific Supervisor**

Fabio Blandini, Scientific Director IRCCS  
Fondazione Mondino (Pavia)

### **Scientific Committee**

Fabio Blandini, Stefano Cappa, Cristina Cereda,  
Mauro Ceroni, Alfredo Costa, Enrico Marchioni,  
Claudio Pacchetti, Anna Pichiecchio (Pavia)



# Speakers and Chairpersons

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## Accreditamento ECM-CPD

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- Assistente Sanitario
- Biologo
- Chimico
- Farmacista (farmacia ospedaliera)
- Fisioterapista
- Infermiere
- Psicologo (Psicologia, Psicoterapia)
- Tecnico della fisiopatologia cardiocircolatoria e perfusione cardiovascolare
- Tecnico di Neurofisiopatologia
- Tecnico Sanitario di Radiologia Medica
- Tecnico Sanitario di Laboratorio Biomedico

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**Registration Participants,  
Speakers and Chairpersons**  
Entrance from Via Magenes

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