

Trento June 13<sup>th</sup>-15<sup>th</sup> 2024

Info: [servizioformazione@apss.tn.it](mailto:servizioformazione@apss.tn.it)

Congress Venue for Theoretical Session – Sala Filarmonica, via Giuseppe Verdi, 30 - Trento  
Congress Venue for Practical Session – Sala Grande FBK - via S. Croce, 77 - Trento



# connect BRAIN Vol. III

Theoretical and practical course on clinical and surgical applications  
of structural and functional connectivity



## LOCAL SCIENTIFIC COMMITTEE

Luciano Annicchiarico (Azienda Provinciale per i Servizi Sanitari, Trento)  
Paolo Avesani, (NiLab, Bruno Kessler Foundation)  
Ludovico Coletta (Bruno Kessler Foundation)  
Francesco Corsini (Azienda Provinciale per i Servizi Sanitari, Trento)  
Jorge Jovicich, (CIMEC, University of Trento)  
Manuela Moretto (CIMEC, University of Trento)  
Laura Vavassori (Azienda Provinciale per i Servizi Sanitari, Trento)

## COURSE DIRECTORS

Silvio Sarubbo  
Luca Zigliotto  
Department of Neurosurgery  
Azienda Provinciale per i Servizi Sanitari  
(APSS), Trento, Italy



*Azienda Provinciale  
per i Servizi Sanitari  
Provincia Autonoma di Trento*

## Introduction

The field of neurosurgery and neurology has undergone a remarkable evolution, closely paralleling the advancements in clinical and basic neurosciences worldwide. Specifically, neuro-oncology and surgery have fostered close collaborations with various disciplines such as neurophysiology, advanced imaging, neuroradiology, neuropsychology, and rehabilitation.

These interactions have facilitated the development, testing, and daily utilization of both invasive and non-invasive techniques in our departments for the study and treatment of patients with brain tumors. The integration of our clinical and scientific worlds has never been more evident, emphasizing the critical importance of interdisciplinary expertise in planning safe and effective treatments and enhancing our understanding of the intricate wiring diagram of the human brain and the neural physiopathology of brain tumors.

In 2015, ConnectBrain was established with the aim of providing a comprehensive course that caters to a diverse audience, including professionals from neurosurgery, neurology, neurophysiology, neuropsychology, rehabilitation medicine, and basic neurosciences. Building upon the success of the second edition in 2019, which attracted an international audience, we are proud to announce the launch of ConnectBrain Vol. III.

For this upcoming edition, we have meticulously assembled a distinguished international faculty comprising experts in the field. These esteemed individuals will enlighten us on the latest methodological advancements in the study of brain structure and function. Their valuable insights will enable us to gain a comprehensive understanding of these breakthroughs and explore their practical applications in the treatment of brain diseases.

## Theoretical Session

Thursday June 13<sup>th</sup>, 2024

Sala Filarmonica  
Via Giuseppe Verdi, 30 - Trento

08:30 - 09:00 Registration  
09:00 - 10:00 Opening - Authorities  
10:00 - 10:30 Lecture introduced by Silvio Sarubbo  
(CISMed, University of Trento)  
*The brain before and the brain today*  
Chiara Maffei  
(Massachusetts General Hospital, Harvard Medical School)

### 10:30 - 11:15 SESSION I

#### Introduction to advanced imaging

Chairmen: Annalisa Trianni (Department of Medical Physics, APSS, Trento),  
Carlo Cosimo Quattrocchi (CISMed, University of Trento)  
*Principles of resting-state fMRI for human brain mapping*  
Bharat Biswal (Department of Radiology, New Jersey Institute of Technology, USA)  
*Techniques and limitations in tractography of the human brain white matter*  
Francois Rehault (University of Sherbrooke, Canada)  
*How to track the brain: tools*  
Paolo Avesani (Neuroinformatics Lab, Fondazione Bruno Kessler, Trento)

11:15 - 11:45 Discussion and Questions

### 11:45 - 12:30 SESSION II

#### Applications of advanced functional mapping imaging in glioma

Chairmen: Yuri Bozzi (Center for Mind and Brain Sciences, University of Trento),  
Giuseppe Della Pepa (Department of Neurosurgery, La Cattolica University, Rome)  
*Extracting brain networks by resting-state fMRI*  
Jorge Jovicich (Center for Mind Brain Sciences, University of Trento)  
*Anatomy and features of brain networks at resting state*  
Francesca Saviola (Department of Medical and Surgical Specialties, Radiological Sciences and Public Health, University of Brescia)  
*Tools and principles for analysis of functional connectivity and brain plasticity*  
Ludovico Coletta (Neuroinformatics Lab, Fondazione Bruno Kessler, Trento)

12:30 - 13:00 Discussion and Questions

10:30 - 12:30 *Open coffee*

13:00 - 14:30 Lunch

## Theoretical Session

14:30 - 15:00 Lecture introduced by Luca Zigiotta (Department of Neurosurgery, APSS, Trento)  
*Understanding brain organization: from lesion mapping studies to brain connections and disconnections*  
Stephanie Forkel (Radboud University, The Netherlands)

### 15:00 - 15:45 SESSION III Evidences of brain connectivity

Chairmen: Bruno Giometto (CISMed, University of Trento), Luigi Cattaneo (Center for Mind and Brain Sciences, University of Trento)

*Dorsal and ventral pathways of the human brain by tractography*

Laurent Petit (GIN-IMN, University of Bordeaux)

*Exploring structural connection with BraDiPho*

Laura Vavassori (Department of Neurosurgery, APSS, Trento)

*Brain connections explored by TMS*

Sandro Krieg (Department of Neurosurgery, University of Munich)

15:45 - 16:15 Discussion and Questions

### 16:15 - 17:00 SESSION IV Invasive mapping

Chairmen: Alessandro Olivi (Department of Neurosurgery, La Cattolica University, Rome), Giuseppe Barbagallo (Department of Neurosurgery, University of Catania)

*Direct electrical stimulation of the human brain for awake surgery*

Emmanuel Mandonnet (Lariboisiere Hospital, University of Paris 7 Diderot)

*Intraoperative monitoring for asleep surgery*

Andrea Szélenyi (Neurophysiology Unit, University of Munich)

*Intraoperative monitoring for exploring supra- and infra-tentorial connections*

Francesco Sala (Department of Neurosurgery, University of Verona)

17:00 - 17:30 Discussion and Questions

17:30 - 18:00 Lecture introduced by Jorge Jovicich (Center for Mind Brain Sciences, University of Trento)

*The era of connectomics: the present and future for clinics*

Michael D. Fox (Department of Neurology, Harvard Medical School, Boston, MA, US)

18:00 Take home messages and closure

15:30 - 17:30 Open coffee

## Theoretical Session

Friday June 14<sup>th</sup>, 2024

09:00 - 09:30 Lecture introduced by Domenico D'Avella (University of Padua)  
*The surgery of brain gliomas across a century*  
Hugues Duffau (Department of Neurosurgery, University of Montpellier, France)

### 09:30 - 10:15 SESSION V Anatomical challenges in brain surgery

Chairmen: Silvio Sarubbo (CISMed, University of Trento), Giannantonio Spena (Department of Neurosurgery, Pavia University-Hospital)

*Insula and temporal stem anatomy*

Federico Pessina (Department of Neurosurgery, Humanitas University, Milan)

*Perisylvian language networks*

Alessandro De Benedictis (Bambino Gesù Pediatric Hospital, Rome)

*Subpial dissection and the access to the insula of Reil*

Michael Sabel (Department of Neurosurgery, University of Düsseldorf, Germany)

10:15 - 10:45 Discussion and Questions



## Theoretical Session

### 10:45 - 11:30 SESSION VI

#### Techniques for motor and cognitive mapping

Chairmen: Rocco Quatralè (Department of Neurology, ospedale dell'Angelo, ULSS 3 Serenissima, Venezia-Mestre), Diego Garbossa (Department of Neurosurgery, University of Turin)

*Motor and higher motor mapping in asleep and awake surgery*

Marco Rossi (Department of Neurosurgery, University of Milan)

*Monitoring higher cognitive functions in awake surgery*

Marco Fontanella (Department of Neurosurgery, University of Brescia)

*Outcomes and perspectives in glioma surgery*

Tamara Ius (Department of Neurosurgery, Hospital of Udine)

11:30 - 12:00 Discussion and Questions

12:00 - 12:30 Lecture introduced by Francesco Sala (Department of Neurosurgery, University of Verona)

*Advancements in genetics and biology of brain tumors*

Alessandro Quattrone (Department of Cellular Computational and Integrative Biology, University of Trento)

10:00 - 12:00 Open coffee

12:30 - 14:00 Lunch

### 14:00 - 14:45 SESSION VII

#### Cognitive testing and outcomes in brain tumor surgery

Chairmen: Filippo Flavio Angileri (Department of Neurosurgery, University of Messina), Jacopo Bonavita (Department of Rehabilitation Medicine, APSS, Trento)

*Neuropsychological testing and outcome*

Luca Zigiotta (Department of Neurosurgery, APSS, Trento)

*Novelties in intra-operative cognitive monitoring*

Guillaume Herbet (Department of Neurosurgery, University of Montpellier, France)

*Cognitive rehabilitation and brain plasticity*

Lorella Battelli (Department of Neurology Harvard Medical School, Boston, MA, US)

14:45 - 15:15 Discussion and Questions

15:15 - 15:45 Lecture introduced by Luca Zigiotta (Department of Neurosurgery, APSS, Trento)

*Updates on education and training opportunities in Neuro-oncology in the EANS framework*

Giovanni Raffa (Division of Neurosurgery, BIOMORF Department, University of Messina)

## Theoretical Session

### 15:45-16:45 SESSION VIII

#### Standards and novelties in treatments of brain tumors

Chairmen: Mattia Barbareschi (CISMed, University of Trento), Valentina Vanoni (Department of Radiotherapy, APSS, Trento)

*Neurosurgery and neuro-oncology: adapting medical treatments and surgical strategies*

Marion Rapp (Department of Neurosurgery, University of Düsseldorf)

*New frontiers in IDH-mutated gliomas treatment*

Roberta Rudà (Department of Neuro-Oncology, University of Torino)

*New insights in the medical treatment of high-grade gliomas*

Giuseppe Lombardi (Department of Oncology, Istituto Oncologico Veneto)

*Radiotherapy and proton-beam therapy for treatment of intrinsic brain tumors*

Dante Amelio (Department of Protontherapy, APSS, Trento)

16:45 - 17:15 Discussion and Questions

17:15 - 17:45 Lecture introduced by Emmanuel Mandonnet (Lariboisière Hospital, University of Paris 7 Diderot)

*New insights in neuro-oncological surgery: technical and conceptual*

Nader Sanai (Ivy Brain Tumor Center, Barrow Neurological Institute, Arizona, US)

18:00 Take home messages and Closure

15:30 - 17:30 Open coffee





## Practical Session

Saturday June 15<sup>th</sup>, 2024

Sala Grande FBK  
Via S. Croce, 77 - Trento

Tutors: Luciano Annicchiarico, Paolo Avesani, Ludovico Coletta, Francesco Corsini, Alessandro De Benedictis, Stephanie Forkel, Jorge Jovicich, Manuela Moretto, Laurent Petit, Francois Rheault, Laura Vavassori, Luca Zigiotto.

### INTRODUCTION

09:00 - 09:15 *Introduction of team and activities*  
S. Sarubbo

09:15 - 09:45 *Tools for the study of perilesional structural and functional organization and for neurosurgical planning*  
P. Avesani, L. Coletta, J. Jovicich, M. Moretto, L. Vavassori, L. Zigiotto

## Practical Session

### SESSION I

09:45 – 11:00 *Structural characterization of language pathways: exploration and visualization of microdissection (BraDiPho), virtual tracking of white matter fibers (Tractome)*

11:00 – 11:20 *Coffee break*

11:20 – 13:00 *Functional distribution of language network: exploration and visualization of DES-based functional network, extraction of resting state fMRI network (ReStNeuMap)*

13:00 – 14:00 *Lunch*

Saturday June 15<sup>th</sup>, 2024

### SESSION II

14:00 – 16:00 *Structural characterization of motor pathways: exploration and visualization of microdissection (BraDiPho), virtual tracking of white matter fibers (Tractome)*

16:00 – 16:20 *Coffee break*

16:20 – 18:00 *Functional distribution of motor network: exploration and visualization of DES-based functional network, extraction of resting state fMRI network (ReStNeuMap)*

18:00 *Closure and certificates*



## Faculty

- **Dante Amelio**  
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- **Emmanuel Mandonnet**  
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**Organised by:**

Department of Neurosurgery

Medical Education Service

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