PHYSICIAN SCIENTIST
LA MEDICINA INCONTRA LA RICERCA
promosso da: AIRC Fondazione CARIPLO | con il supporto di: UNIVERSITÀ DEGLI STUDI DI MILANO

2026 Physician Scientist Call

AVAILABLE POSITIONS

Principal Investigator	BELLO LORENZO
Institute of Affiliation	Università degli Studi di Milano
Title of the proposed project:	Personalized Function-based resection for IDH-mutant glioma patients
Short description of the project	Surgical treatment of IDH-mutated gliomas is a therapeutic strategy capable of significantly altering the natural history of the disease; its goal, when feasible, is the removal of both the visible and invisible (infiltrative) portions of the tumor (so-called supratotal resection) and the preservation of the patient's functional integrity. This significantly delays recurrences, prolongs survival and maintains long-term quality of life. This is achievable through so-called brain mapping techniques, which allow for resection within functional boundaries. The ability to achieve this goal depends on the degree of functional reorganization achieved by the individual's brain-that is, how the interaction between the tumor and the brain circuits where the tumor develops has altered brain functionality, leading to the reorganization and deactivation of the infiltrated circuits. The aim of surgery, using personalized function-based resection techniques, is to identify the interface between infiltrative tumor cells and still functioning brain circuits. The identification of this interface (in terms of location and extension) determines the extent of the surgical resection (EOR), as well as its oncological and functional outcomes The project aims to determine in patients with IDH-mutated gliomas the degree of functional reorganization achieved through tumor-brain interaction in the individual patient's brain and to evaluate its impact on oncological end functional outcomes. The project consists of three phases: 1) preoperative: determination of the degree of functional reorganization at individual patient and population levels through the integration of rs-fMRI and neuropsychological and psycho-oncological assessments; 2) intraoperative: validation of the established degree of reorganization through individualized intraoperative functional mapping; definition of location, extension and functional reprogramming; correlation with pre-operative findings; 3) post-operative: functional (post-operative short and long-term neuropsychological assessment) and oncological (EOR) outcomes The project aligns with the objectives of the AIRC IG 27184 grant, which focuses on the reorganization of the motor system.
Main research area for the project	Neurobiology
5 key words for the project	Glioma and/or glioblastoma, Magnetic resonance imaging (MRI), Surgery, Clinical trials, Neoadjuvant therapy

LAB INFO	
Main topic/s of the lab	Functional organization of brain networks to foster tumor resection and preserving patient quality of life
Short description of the lab activity	The clinical and research team at IRCCS Galeazzi Sant'Ambrogio incorporates neurosurgeons, neurophysiologists,

	neuropsychologists and psycho-oncologists devoted to treating brain tumor patients, and closely collaborating in a bed-to-bench and vice versa approach with the neurophysiology and neuropsychology labs, and basic laboratory labs. The team is currently surgically treating more than 400 brain tumor patients a year, and over 2500 patients at the out-patient clinic, with a large program for lower-grade gliomas, making the team one of the leading groups in Italy and Europe in this field. The main clinical and neuroscience research achievements are in the field of brain mapping techniques for glioma resection, specifically: 1.Developments of brain mapping techniques for motor mapping and motor glioma resection (Neuro-Oncology, 2014) 2.Identifying and describing the circuits subserving human non primary motor areas involved in skilled hand movements, developing the appropriate intra-operative tasks and devices along with the intra-operative protocols used during glioma resection (currently standard of care, Cerebral Cortex 2018, 2020, Brain 2021, 2022, 2024, 2025) to avoid the onset of apraxia and dramatically reduce the need of motor rehabilitation. 3.Describing the functional organization of the human primary motor cortex (Cortex, 2019, 2021, J Neurosci 2021, Brain 2025) and the associated intra-operative neurophysiological protocols (Journal of Neurosurgery, 2018, Neurosurgery, 2020; Cancers 2021, Brain 2025), making tumors in this area surgically treatable, extending resection and avoiding post operative motor deficits 5.Identifying and describing the functional organization of the circuits subserving some high cognitive functions in the human brain, developing the intra-operative tasks and protocols to be used for glioma resection (executive functions, Brain 2019, 2022; motor awareness, Nature Comm, 2019; visuospatial attention, Nature Comm, 2025), preserving global cognitive functions. The major achievements have been generated in understanding the functional organization of the motor system, and the team is currently recognized as one of the world leaders in this field (many lectures at international surgical, neuro-oncological and neuroscience meetings and courses, awards from SNOLA). Many of the techniques described are currently considered as standards and are reported in Rano-resect;Piooner groups recommendations papers (Lancet Oncology,2026). Based on his achievements in brain mapping, since 2007 the team developed the intraoperative technique for glioma resection aimed at supratotal resection (resection outside the MR-visible tumor border), describing its feasibility and the protocols (Journal of Neurosurgery, 2016), as well as the oncological and functional outcomes (first papers for lower-grade gliomas, Neuro-Oncology, 2020,2025) and recently incorporating them as surgical gold standard for glioma resection in the context of RANO-Resect group papers (Lancet Oncology,2025; Neuro-Oncology,2023-2025), to which his team has significantly contributed.
Recent bibliography	- The parietal architecture binding cognition to sensorimotor integration: a multimodal causal study. BRAIN 2024 Jan; 147: 297

	- White matter connections within the central sulcus subserving the somato-cognitive action network. BRAIN 2025 May; 148: 1789 - Neuro-Oncological Superiority of Supratotal Resection in Lower-Grade Gliomas. NEURO-ONCOLOGY 2025 Jun; 27: 1270 - A prognostic classification system for extent of resection in IDH-mutant grade 2 glioma: an international, multicentre, retrospective cohort study with external validation by the RANO resect group. LANCET ONCOL 2025 Dec; 26: 1638 - Convergent causal mapping unravels distinct frontal networks for visuospatial selective attention. NAT COMMUN 2025 Dec; 17: 659
Group composition	Two PI, 4 senior researchers, 3 junior researches, 4 students