

IBFM Characteristics

Staff

Permanent Scientists: 34;
Technical staff: 8;
Administration staff: 4.
Non Permanent staff: 50

Research projects

EEC (FP7 Infrastructures), MIUR (Progetti Bandiera, Premiali, di interesse, FIRB), PON/POR (Programma Operativo Nazionale/Regionale) Fondazione CARIPLO, TELETHON.

Publications

In the period 2011-2014: 265 publications on ISI Journals. The average Impact Factor is IF 4,2.

Collaborations

with: CNR Institutes, Universities, IRCCS and National and International Research Institutions.

Partnerships

- Research Infrastructures ESFRI: SysBioNet Euro-Biolmaging (Facility 45, WP8 Molecular Imaging); IMINet;
- National Cluster Technologies for Ambient Living;
- Regional Clusters (Lombardia): Technologies for Ambient Living, Technologies for smart communities, Life Sciences
- Regional Districts: Biomedical District (Sicilia); Calabria;
- Innovation Hubs: Tecnobionet (Liguria), Bio-TecnoMed (Calabria).

Education

Teaching appointments, Tutoring for undergraduate and PhD Students.



Main Institute:
LITA Building - Via Fratelli Cervi 93
20090 Segrate
Tel +39-0221717514
Fax + 39-0221717558
E-mail: segreteria@ibfm.cnr.it

Section Lecco
Polo della Ricerca del CNR
Campus Universitario
Politecnico di Milano a Lecco
Via Previati, 1/C
23900 Lecco



UOS Genova:
c/o DINOGMI
Via De Toni, 5 - 16132 Genova
Tel 010 3537466
Fax 010 3538631
Email genova@ibfm.cnr.it

UOS Cefalù:
Contrada Pietra Pollastra-Pisciotta
90015 Cefalù (PA)
Tel 0921 920612
Fax
Email cefalu@ibfm.cnr.it

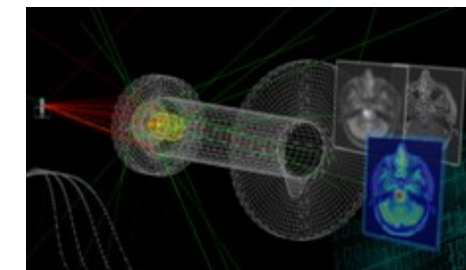
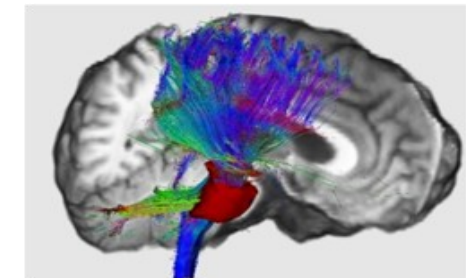
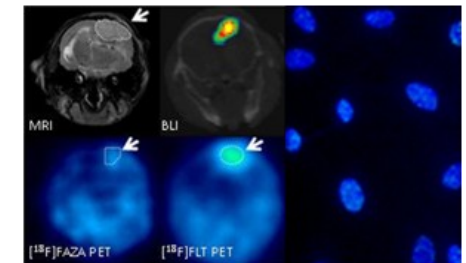


UOS Germaneto:
Campus Universitario V.le Europa
88100 Germaneto (CZ)
Tel. 0961 3695900
Fax 0961 3695919 Fax
Email: germaneto@ibfm.cnr.it



Consiglio Nazionale delle Ricerche

ISTITUTO DI BIOIMMAGINI E FISILOGIA MOLECOLARE (IBFM)



IBFM

IBFM exploits interdisciplinary biomedical research activities aimed at studying physiological and pathogenetic mechanisms with a bottom-up approach, which starts from molecular, cellular, and organ levels to human model. A wide array of techniques is used, including in vivo and ex vivo biomedical imaging, molecular diagnostics and analysis of physiological signals.

IBFM is part of the Department of Biomedical Sciences.

Current organization is as follows:

- Main Institute in Segrate (MI), LITA Building;
- Section in Genoa, at the University of Genoa;
- Section in Cefalù (PA), at the Laboratory of Oncological Technologies (LATO), Hospital San Raffaele G.Giglio;
- Section Germaneto (CZ), at the University Magna Graecia of Catanzaro;
- Section Lecco, at the Milan Politecnico University Campus.

The research approach of IBFM is characterized by:

- High technology, making use of advanced equipment, in particular in the field of Bioimaging, taking advantage from formal agreements with Universities and Medical Institutes of Research;
- Multi-disciplinarity: research topics involve several disciplines ranging from medical to technological;
- Inter-disciplinarity: different disciplines are closely integrated through scientific collaborations towards common research goals;
- Connection between basic and clinical/applied research: translational research implying a direct transfer of results from basic to clinical research and vice versa.

Main research groups are: Exercise Physiology, Molecular Imaging, Neuroimaging, Radiation Therapies and Biological effects.

Exercise Physiology

The group of Exercise Physiology in Segrate is focused on the study of skeletal muscle structure/ function, in relation to physical activity.

A multiparametric perspective (involving anatomy, physiology, biomechanics, biochemistry, biosignals and bioimaging) is adopted. The following fields are investigated in health and disease (metabolic, cardiovascular, neurologic) and/or in several ambient conditions (high altitude, microgravity, diving, etc.):

- a) bioenergetics and bio mechanics of human movement / locomotion;
- b) cardiorespiratory response to exercise;
- c) skeletal muscle oxygenation;
- d) direct and indirect quantification of oxidative stress damage;
- e) image and signal analysis for quantitative reconstruction of skeletal muscles and cardiocirculatory structures, along with brain functioning.

Molecular Imaging

Molecular Imaging. This group is set in Segrate and involves the UOS in Genova. It combines ex vivo and in vivo Molecular Imaging methods (omics, pre-clinical, clinical) with advanced processing algorithms, for the comprehension of multi-factorial pathologies and the extraction of new biomarkers, in neurology, cardiology, oncology. Methodology includes advanced biostatistical and bioinformatics techniques, integrating multi-dimensional signal and imaging data in a systemic approach. The group relies on strong formal collaborations with excellent research centers (e.g. ESRF, Grenoble) and clinical structures (San Raffaele Institute, other IRCCS, University Hospitals), providing access to relevant diagnostic/therapeutic instrumentation (e.g. PET/CT, MRI, radiotherapy) and is formally partner of pan-European Research Infrastructures ESFRI: SysBioNet, EuroBioImaging.

Neuroimaging

The Neuroimaging group of Germaneto (CZ) is recognized as one of foremost center for the study of movement disorders (Parkinson's disease, Essential Tremor). The research portfolio encompasses also Multiple Sclerosis, Epilepsy and Alzheimer's disease, including basic research in normal cognition involving studies elucidating various components of brain functions in normal volunteers. A guiding hypotheses posits that the study of the neural bases of neurological disorders converges with the mapping of normal cognitive functions to provide novel insight. Research focuses heavily on the development of advanced technological methods of a number of neuroimaging techniques including structural magnetic resonance imaging (MRI), functional MRI and Near-Infrared Spectroscopy (NIRS). Major contributions include key studies on biomarkers in Parkinson's disease, neuroimaging characterization of sub-clinical phenotypes of motor disorders, and development of computer-aided diagnosis through segmentation and machine learning methods.

Radiation Therapies and Biological effects

This is a young group, set in Cefalù, focusing research on the study of biological effects of therapies by Ionizing Radiation (radiotherapy) and high/low intensity Focused Ultrasounds (HIFU/LOFU). One of the main target is to study molecular mechanisms that regulate proliferation and survival of tumor cells in order to drive the development of novel therapeutic approaches. This goal is pursued taking advantage from the multidisciplinary skills in the group: i) Molecular Biology, adopting a proteogenomic approach, to deeply evaluate the main pathways involved in the cell response to these stress stimuli; ii) Medical Physics, to study and optimize the physical characteristics of the radiation by both experimental techniques and computer simulations; iii) Engineering, to develop image processing methods for the definition of the target volume to be treated, and for the follow-up and monitoring of the therapy response.