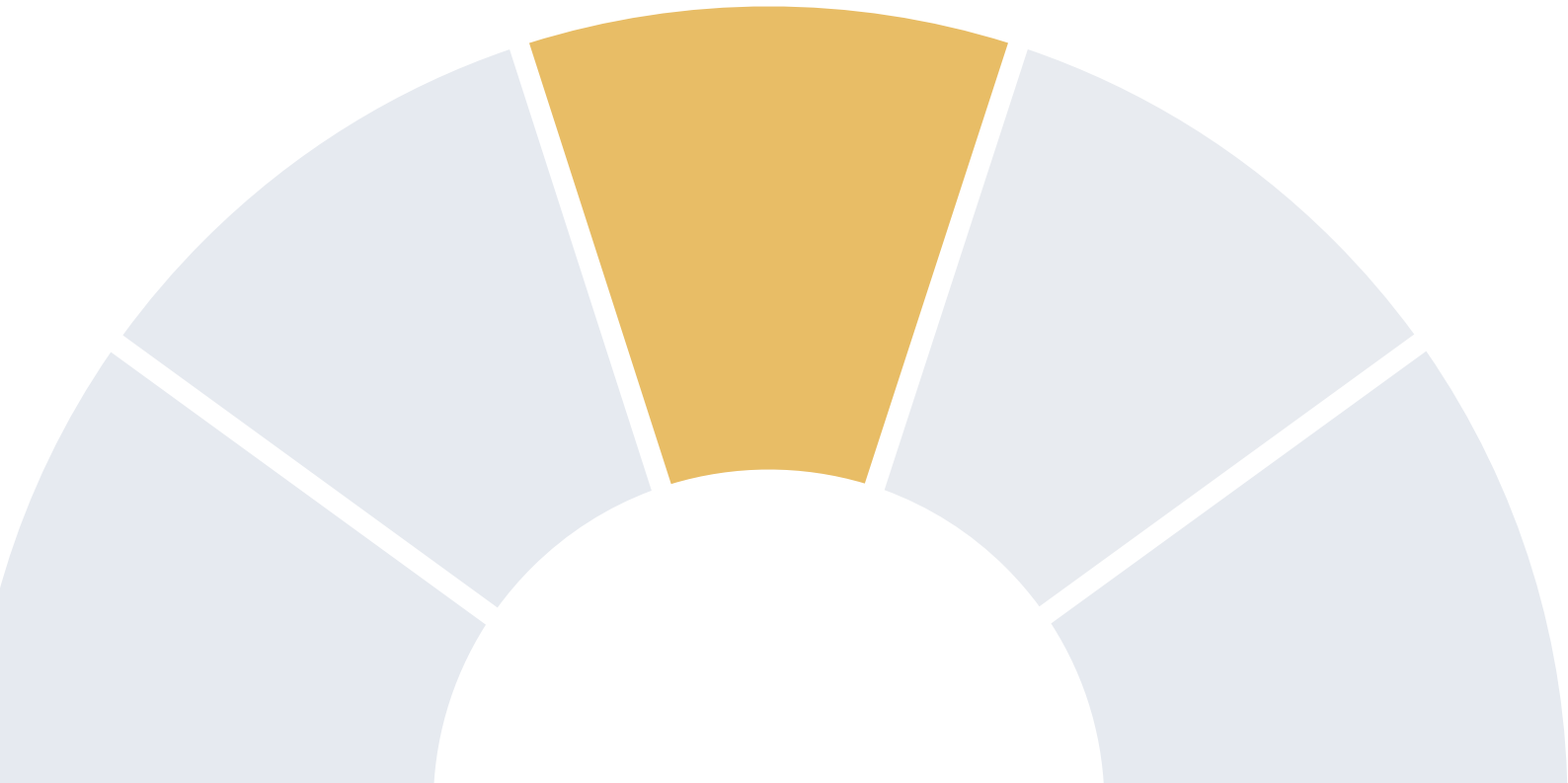
ANNUAL REPORT

2022

CIBM
Center for Biomedical Imaging

cibm.ch

EXCELLENCE IN BIOMEDICAL IMAGING



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WELCOME MESSAGE

We are delighted to share with you the remarkable progress and achievements of CIBM in 2022. This year, which marks the midway point of our strategic roadmap 2020-2024, has been a period of intense growth in terms of personnel, funding, awards, and visibility. These accomplishments would not have been possible without the ongoing dedication and collaborative efforts of our Core, Affiliate, Associate, and Alumni members. Thank you for your unwavering commitment and teamwork.

With Switzerland lifting most COVID-19 restrictions, we joyfully resumed many on-site events previously hindered by the pandemic. We welcomed group visits to our premises and reinvigorated our outreach activities. Additionally, our presence at several prominent annual events underscored our commitment to advancing our field. We were proud to attend and present at Brain Week in Lausanne, the International Society for Magnetic Resonance in Medicine (ISMRM) in London, the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) in Singapore, the International Multisensory Research Forum (IMRF) in Ulm, the Organization for Human Brain Mapping (OHBM), and the IEEE Engineering in Medicine and Biology Society Conference (EMBC) in Glasgow.

We celebrated the annual BBL-CIBM-FCBG MRI Research Day and the inauguration of the newly installed 3T MRI scanner at the Brain Behavior Laboratory, University of Geneva, now an integral part of the CIBM infrastructure. We also marked the arrival of the Siemens Healthineers MAGNETOM Terra 7T MRI full body scanner at Campus Biotech in Geneva, in collaboration with the Human Neuroscience Platform, Fondation Campus Biotech Geneva (FCBG), EPFL, UNIGE, and HUG.

Thank you once again for your dedication and collaboration. We are confident that with your continued support, we will achieve even greater heights in the coming year with several exciting initiatives on the horizon.

Pina Marziliano

CIBM Executive Director

François Lazeyras

Scientific Steering Committee President

CIBM CENTER FOR BIOMEDICAL IMAGING

ABOUT

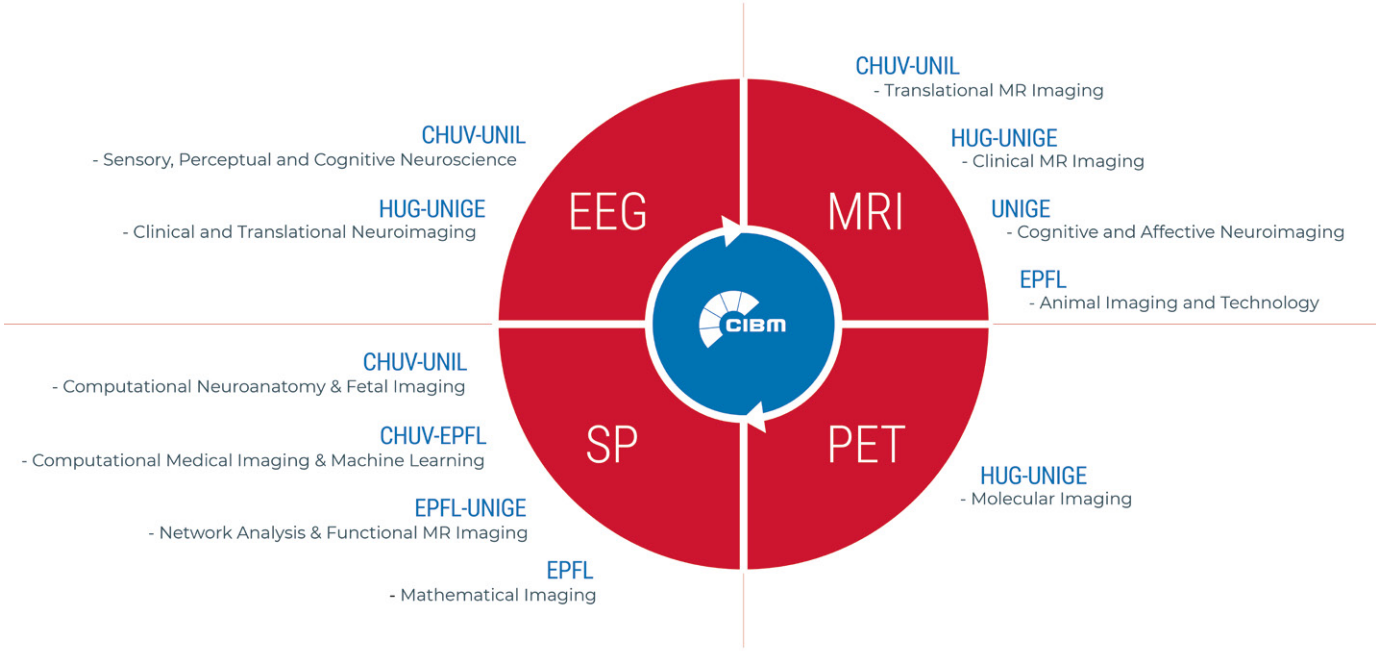
The CIBM Center for Biomedical Imaging is the result of a major research and teaching initiative by the partners of the Science-Vie-Société (SVS) project between the École polytechnique fédérale de Lausanne (EPFL), the Université de Lausanne (UNIL), the Université de Genève (UNIGE), the Hôpitaux Universitaires de Genève (HUG) and the Centre Hospitalier Universitaire Vaudois (CHUV). CIBM was founded in 2004 with the generous support of the Fondation Leenaards and the Fondation Louis-Jeantet.

Vision

CIBM's vision is to be recognized as a global leader in biomedical imaging for the advancement of science, health, medicine and technology. We achieve this by conducting innovative research, disseminating knowledge and providing expertise together with the latest high-end infrastructure.

Mission

CIBM's mission is to amplify the synergy of scientific, health care, and industrial use of biomedical imaging for maximum effectiveness of our partners and users in a vibrant, interdisciplinary research, teaching, and service environment.



CIBM constitutes a network of well-recognized experts in biomedical imaging. It provides expertise and access to the most advanced cutting-edge infrastructure to researchers, scientists, engineers and medical doctors in the Lemanic region and beyond.

CIBM enables multidisciplinary teams located at different sites to collaborate and develop new technologies for the advancement of basic science, translational and clinical research. The research areas of expertise cover four modules: Electroencephalography (EEG), Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), Signal Processing (SP).

Core Values

Excellent | Innovative | Collaborative | Inclusive | Transparent | Inspirational

STRATEGIC OBJECTIVES

In 2022, different initiatives, further detailed in this report, were established to achieve the identified key strategic objectives outlined below.

Lead and play an umbrella role in biomedical imaging technology in the region

Develop the latest cutting-edge biomedical imaging methods and technologies that are translational and clinically useful

Invest and provide access to state-of-the-art infrastructure

Provide expertise, training, technical support and networking opportunities to the CIBM Community

Increase funding and diversify sources

Establish a CIBM flagship strategic landmark project

Increase synergy amongst different CIBM Sections

Be key opinion leaders in biomedical imaging

COMMUNITY

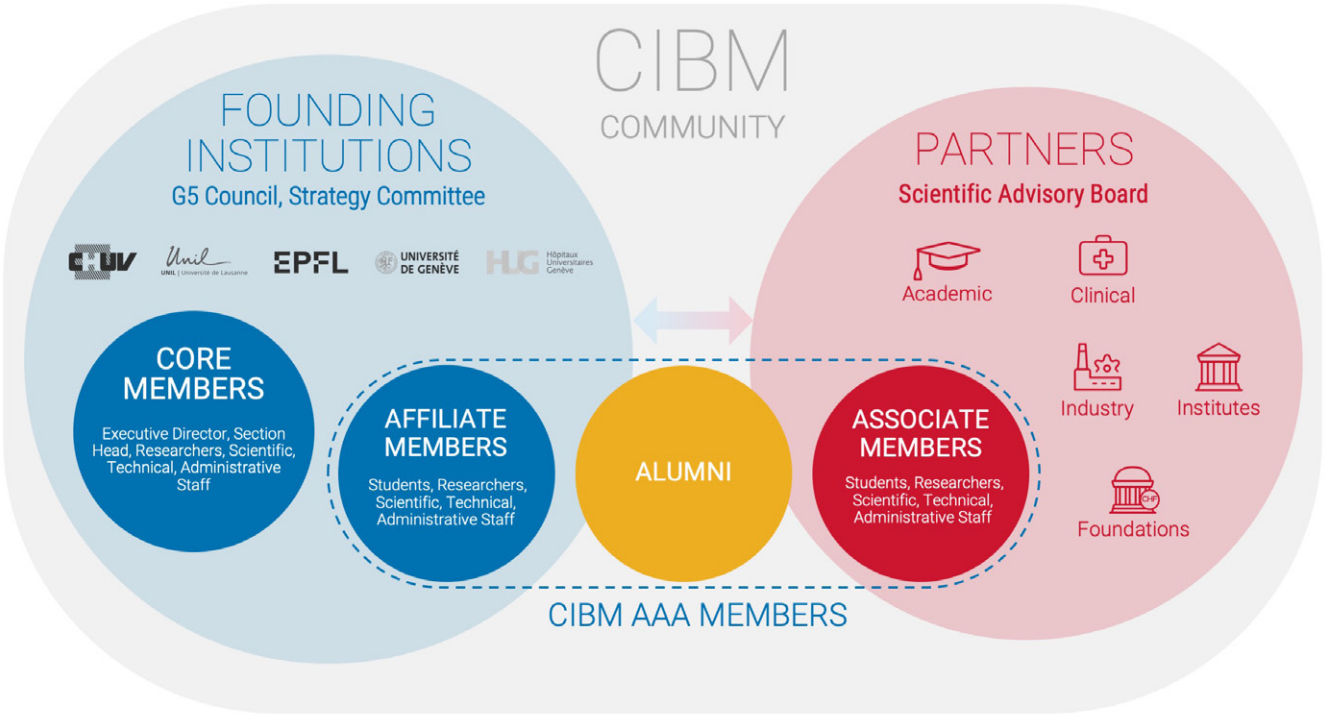
The CIBM Community is composed of Core, Affiliate, and Associate Members, as well as Alumni.

CIBM Core Members comprise the Leadership Team together with its staff. They are a highly qualified, complementary, and multidisciplinary group of people with a common interest in biomedical imaging. They provide expertise, enable technology transfer, and promote interactions with collaborators affiliated with the CIBM founding institutions and associated with other partners in academia, hospitals, and industry.

CIBM Affiliate and Associate Members are students, researchers, scientific, technical, and administrative staff closely collaborating with the CIBM Core Members on grants, projects, publications, and co-supervision of students.

CIBM Alumni are past Core Members.

Every year, the CIBM community continues to grow with increasing national and international collaborations for the benefit of global health.

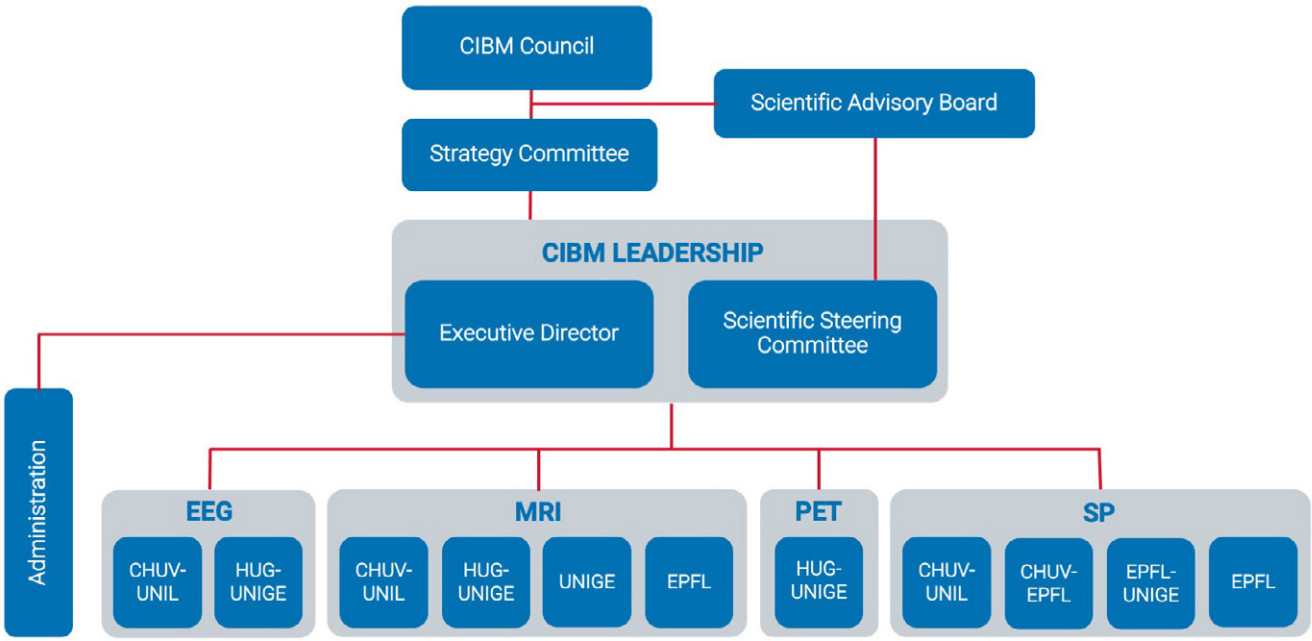


ORGANISATION

CIBM is governed by a Council and a Strategy Committee composed of senior leadership members from the five founding institutions.

The CIBM Scientific Advisory Board is a committee of three renowned international experts in biomedical imaging who advise the CIBM Council and the CIBM Scientific Steering Committee.

The CIBM Leadership team consists of the Executive Director and the Scientific Steering Committee formed by all Section Heads, among whom a President is elected.



The CIBM organizational structure consists of four modules (EEG, MRI, PET, and SP) and 12 sections, including administration, located across the Lemanic region (CHUV, UNIL, EPFL, UNIGE, HUG, and Campus Biotech). The sections are headed by leading experts with complimentary knowledge, thereby enabling novel discoveries and technological advancement in biomedical imaging. The Section Heads also play an ambassadorial role on behalf of their respective institutions, promoting interaction, collaboration, communication, and knowledge dissemination within and beyond the five founding institutions.

GOVERNANCE

COUNCIL

Philippe Eckert
General Director

Frédéric Herman
Rector

Martin Vetterli
President

Yves Flückiger
Rector

Bertrand Levrat
General Director

CHUV · UNIL | Université de Lausanne · EPFL · UNIVERSITÉ DE GENÈVE · HUG Hôpitaux Universitaires Genève

STRATEGY COMMITTEE

Reto Meuli
Head of Medical Radiology

Estelle Doudet
Vice-Rector

Anna Fontcuberta
Associate Vice President for Centers & Platforms

Antoine Geissbuhler
Vice-Rector

Jean-Paul Vallée
Head of Cardiovascular Radiology

SCIENTIFIC ADVISORY BOARD

Sabine Kastner
Princeton University, USA

Denis Le Bihan
Neurospin CEA Paris, FR

Markus Rudin
ETHZ, CH

LEADERSHIP

SCIENTIFIC STEERING COMMITTEE

EEG

Micah M. Murray
EEG CHUV-UNIL

Christoph M. Michel
EEG HUG-UNIGE

EXECUTIVE DIRECTOR

Pina Marziliano

MRI

Matthias Stuber
MRI CHUV-UNIL

François Lazeyras
MRI HUG-UNIGE

Patrik Vuilleumier
MRI UNIGE

Dimitri Van De Ville
MRI EPFL

SP

Meritxell Bach Cuadra
SP CHUV-UNIL

Jean-Philippe Thiran
SP CHUV-EPFL

Dimitri Van De Ville
SP EPFL-UNIGE

Michael Unser
SP EPFL

PET

Valentina Garibotto
PET HUG-UNIGE

AREAS OF EXPERTISE

PERSONNEL

Research Staff Scientists

Benedetta Franceschiello
EEG CHUV-UNIL

Chrysoula Retsa
EEG CHUV-UNIL

Tomas Ros
EEG HUG-UNIGE

Eleonora Fornari
MRI CHUV-UNIL
3T MRI Operational Manager

Jérôme Yerly
MRI CHUV-UNIL

Sébastien Courvoisier
MRI HUG-UNIGE
3T MRI Operational Manager

Antoine Klauser
MRI HUG-UNIGE

Cristina Cudalbu
MRI EPFL
9.4T MRI Operational Manager

Sandra Da Costa
MRI EPFL

Thomas Di Mattia*
MRI EPFL

Bernard Lanz
MRI EPFL
14.1T MRI Operational Manager,
PET Operational Manager,

Katarzyna Pierzchala
MRI EPFL
Neurochemistry Lab Manager

Dunja Simic*
MRI EPFL

Daniel Wenz
MRI EPFL

Lijing Xin
MRI EPFL
7T MRI Operational Manager

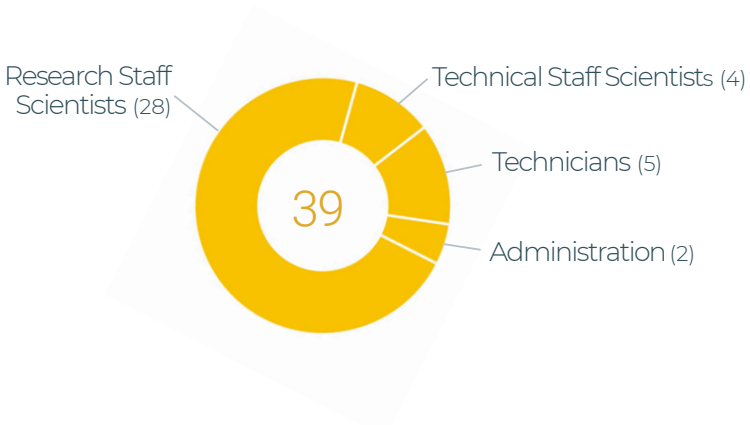
Olivia Bejuy
PET HUG-UNIGE
PET Operational Manager

Kelly Ceyzeriat
PET HUG-UNIGE

Jaime Barranco*
SP CHUV-UNIL

Pedro Macias Gordaliza*
SP CHUV-UNIL

Hélène Lajous*
SP CHUV-UNIL



** Funded through external grants obtained by CIBM Research Staff*

PERSONNEL

Research Staff Scientists

Thomas Sanchez*
SP CHUV-UNIL

Behzad Bozorgtabar
SP CHUV-EPFL

Elda Fischi
SP CHUV-EPFL

Gabriel Girard
SP CHUV-EPFL

Maria Giulia Preti
SP EPFL-UNIGE

Pol del Aguila Pla
SP EPFL

Technical Staff Scientists

Denis Brunet
EEG HUG-UNIGE

Analina Hausin
MRI EPFL
Animal Physiologist

Mario Lepore
MRI EPFL
Animal Physiologist

Stefanita Mitrea
MRI EPFL
Veterinary Surgeon

Technicians

Jean-Baptiste Ledoux
MRI CHUV-UNIL

Yohann Ouvrier-Buffet
MRI HUG-UNIGE

Yves Pilloud
MRI EPFL

Dario Sessa*
MRI EPFL

Stéphane Germain
PET HUG-UNIGE

Administration

Sarah Junod
Administrator

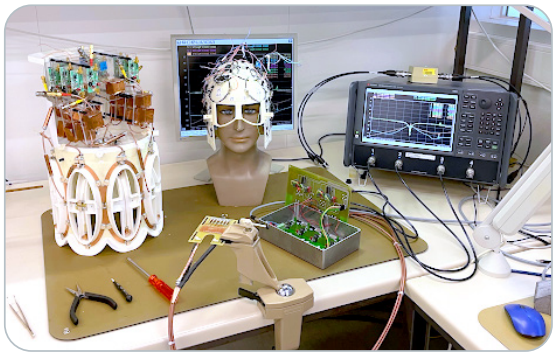
Florian Iannalfo
Data & IT Systems

** Funded through external grants obtained by CIBM Research Staff*

INFRASTRUCTURE

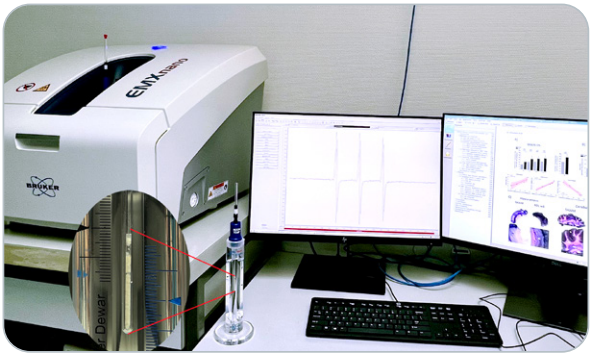
CIBM offers the most advanced state-of-the-art infrastructure.

RF Technology Laboratory



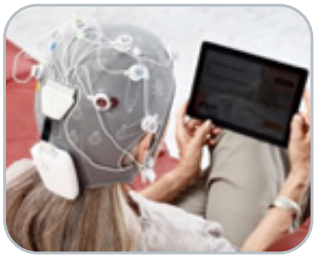
Fully equipped Radial-Frequency coil infrastructure and electronics lab.
EPFL - Lausanne

Neurochemistry Laboratory



Bench-Top EPR EMXnano Bruker,
EPFL - Lausanne

Electroencephalography



STARSTIM-HOME tES stimulation systems, *UNIGE - Campus Biotech, Geneva*

EGI hydrocel caps.
NES Lab, CHUV - Lausanne
BBL, *UNIGE - Geneva*

Actively shielded Ag/AgCl gel electrode caps
NES Lab, CHUV - Lausanne

Dry EEG electrode caps
NES Lab, CHUV - Lausanne

Transcranial Magnetic Stimulation (TMS) Magstim Rapid2 and Bistim systems
NES Lab, CHUV - Lausanne
BBL, UNIGE - Geneva

Multiple and modular EEG amplifiers for high-density EEG, hyperscanning, and mobile applications. *NES Lab, CHUV -Lausanne*

EEG tACS System
BBL, UNIGE - Geneva

INFRASTRUCTURE

Human Magnetic Resonance Imaging

NEW IN 2022

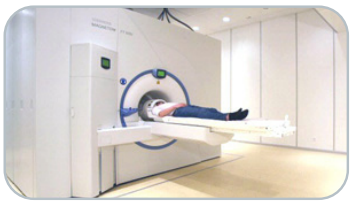
7 Tesla MRI Magneton
Campus Biotech – Geneva

NEW IN 2022

3 Tesla MRI Prisma Fit
UNIGE - Geneva

3 Tesla MRI Prisma Fit
HUG – Geneva

3 Tesla MRI Prisma Fit
CHUV – Lausanne



7 Tesla MRI Magnetom
EPFL – Lausanne

Animal Magnetic Resonance Imaging

9.4 Tesla MRI Magnex
EPFL – Lausanne

14.1 Tesla MRI Magnex
EPFL – Lausanne

Positron Emission Tomography

Avalanche Photodiode PET
EPFL – Lausanne

PET/SPECT/CTTriumph
HUG – Geneva

CORE ACTIVITIES

CIBM's principle undertaking revolves around its people and its infrastructure. Main activities of the research centre and partnerships can be usefully classified in three categories: research, teaching, and service.

RESEARCH

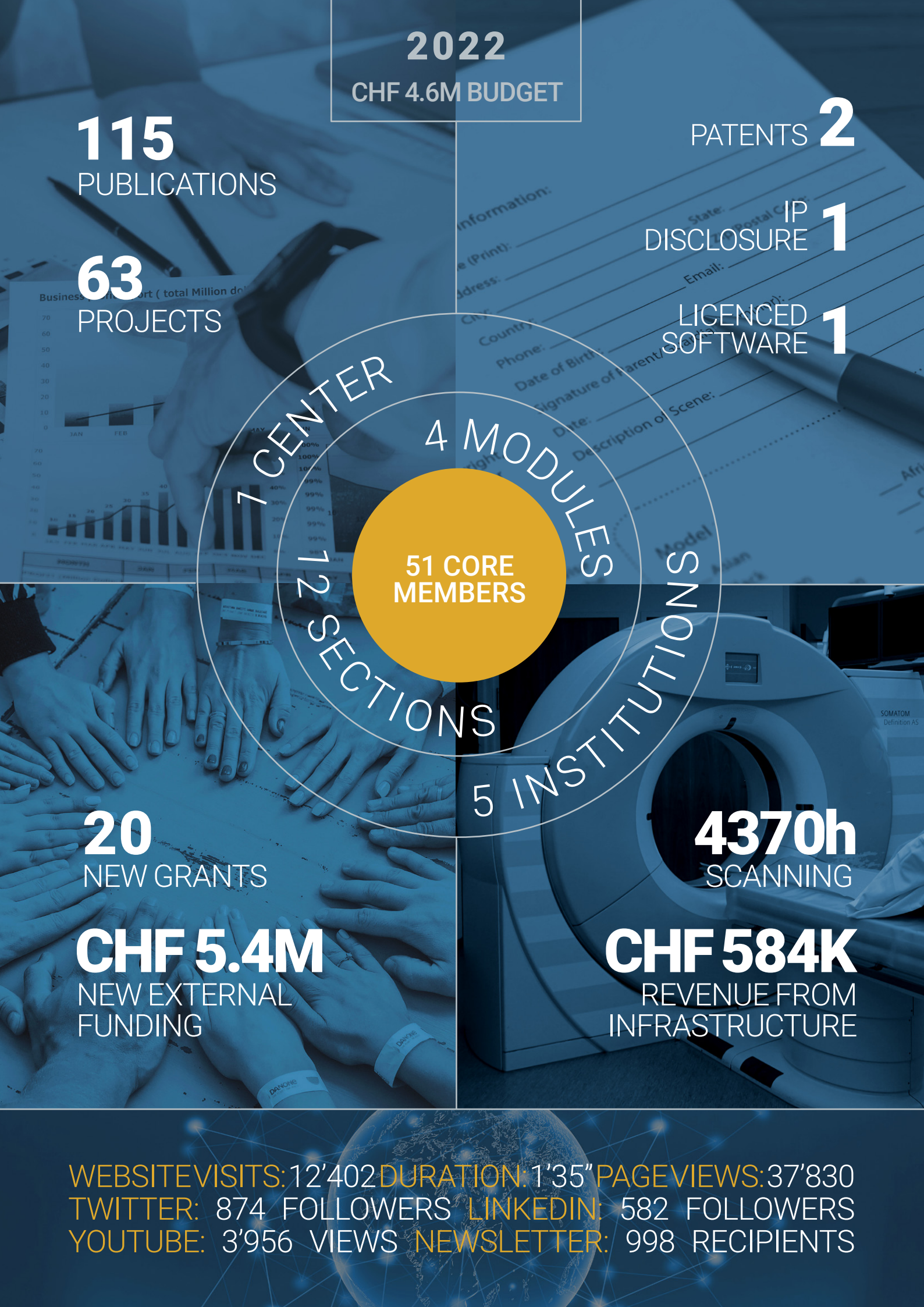
- Develop innovative and cutting-edge technology
- Create a stimulating scientific and supportive environment
- Conduct translational research leading to social impact and clinical usefulness

TEACHING

- Further knowledge through basic and advanced level courses
- Tutorials, Workshops, Seminars
- Summer/Winter Schools
- Practical training

SERVICE

- Provide expertise and scientific know-how
- Access to high quality infrastructure
- Offer networking opportunities to local and international partners



2022

CHF 4.6M BUDGET

115
PUBLICATIONS

63
PROJECTS

PATENTS **2**

IP DISCLOSURE **1**

LICENCED SOFTWARE **1**

7 CENTER
4 MODULES
12 SECTIONS
5 INSTITUTIONS

51 CORE MEMBERS

20
NEW GRANTS

CHF 5.4M
NEW EXTERNAL FUNDING

4370h
SCANNING

CHF 584K
REVENUE FROM INFRASTRUCTURE

WEBSITE VISITS: 12’402 DURATION: 1’35” PAGE VIEWS: 37’830
TWITTER: 874 FOLLOWERS LINKEDIN: 582 FOLLOWERS
YOUTUBE: 3’956 VIEWS NEWSLETTER: 998 RECIPIENTS

RESEARCH

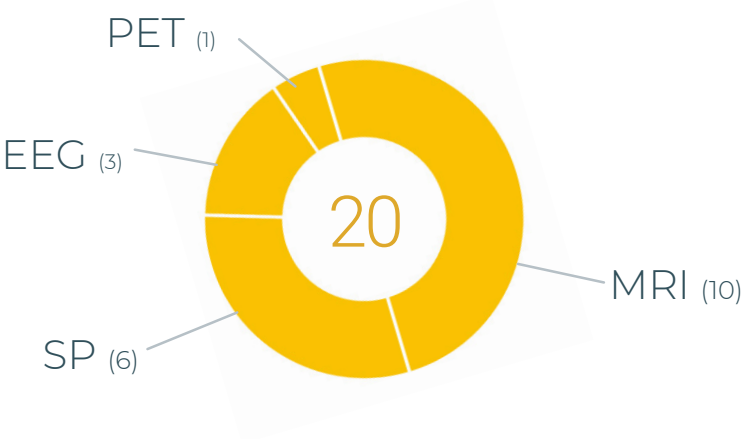
SUMMARY

CIBM's research capacity continued to be strengthened in 2022 with 63 new research projects spanning across the different sections of the four modules : Electroencephalography (EEG), with Sensory, Perceptual, and Cognitive Neuroscience at CHUV-UNIL and Clinical and Translational Neuroimaging at HUG-UNIGE; Magnetic Resonance Imaging (MRI) with Translational MR Imaging at CHUV-UNIL, Clinical MR Imaging at HUG-UNIGE and Animal Imaging and Technology at EPFL; Positron Emission Tomography (PET) with Molecular Imaging at HUG-UNIGE; Signal Processing (SP) with Computational Neuroanatomy and Fetal Imaging at CHUV-UNIL, Computational Medical Imaging and Machine Learning at CHUV-EPFL, Network Analysis and Functional MR Imaging at EPFL-UNIGE and Mathematical Imaging at EPFL.

In 2022, the CIBM made significant advancements in intellectual property, aligning with its goal to develop cutting-edge, clinically useful biomedical imaging technologies. Key achievements included the submission of an invention disclosure for an MRI-compatible stereoscopic viewing device to UNITEC, the filing of a European patent by EPFL TTO for high-dimensional parameter determination based on MR fingerprinting measurements, and the granting of a US patent for a method and system to monitor biological processes, developed through a collaboration between CHUV, UNIL, EPFL, the University of Basel, and Siemens Healthineers. These innovations underscore CIBM's commitment to translational research and clinical application.

Fulfilling the strategic objective of increasing funding and diversifying grant sources, the Core members of the CIBM successfully secured CHF 5.424 million in research funding for 20 new projects in 2022. This achievement drew from a wide array of internal and external sources, including EPFL, the University of Geneva, Geneva University Hospitals, the Swiss National Science Foundation, Gelbert Foundation, Gertrude von Meissner Foundation, Hasler Stiftung, ISTANJAC Foundation, Novartis Foundation, ProTechno Foundation, EU H2020, SERI, and The Sense Innovation and Research Center.

NEW FUNDED PROJECTS



PUBLICATIONS

TECHNOLOGY TRANSFER

DISCLOSURES

Invention Disclosure, December 2022. Title: MRI-compatible stereoscopic viewing device. Inventors: E. Badier, F. Grouiller, C. Mermoud (University of Geneva). UNITEC

PATENTS

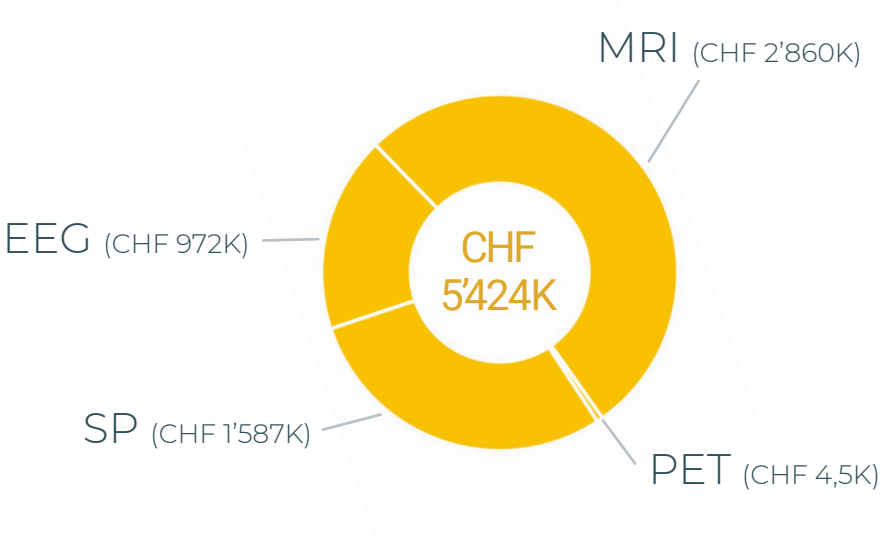
EP Patent filed 22 April 2022. High-Dimensional Parameter Determination based on MR Fingerprinting Measurements. Application number EP22169601. Inventors: Songi Lim, Mark Widmaier, Lijing Xin (EPFL).

US Patent granted 17 May 2022. Method and system for monitoring a biological process. Patent number 11335001, . Inventors: Mario Joao Fartaria De Oliveira (EPFL), Tobias Kober (Siemens Healthineers), Benedicte Marechal (Siemens Healthineers), Cristina Granziera (University of Basel, Meritxell Bach Cuadra (CHUV, University of Lausanne).

LICENSED SOFTWARES

Licensed Software. Pulse sequence (sSPECIAL, MEGA-sSPECIAL) transfer via c2p agreement to University of Pittsburgh. Lijing Xin (EPFL).

FUNDING



EPFL

MRI EPFL

CHF 180K

Understanding of normal, healthy and perturbed physiology – ex-vivo living 3D tissue and organoids imaging. EPFL internal funding for equipment. PI : Katarzyna Pierzchala. CHF 180'000 (10.2022)

UNIVERSITÉ DE GENÈVE

PET HUG-UNIGE

CHF 4,5K

PET/SPECT/CT scanner connector. Fond d'Investissement de la Faculté de Médecine, UNIGE. PI: Valentina Garibotto, Olivia Bejuy CHF 4'451. (2022).

HUG Hôpitaux Universitaires Genève

MRI HUG-UNIGE

CHF 8K

Benefit of high-resolution whole-brain spectroscopic imaging on the study of hereditary metabolic diseases – EIM MRSI. The HUG Start-up Fund covers scan time, CCER, compensation. The recipients are Antoine Delattre-Klauser, Sebastien Courvoisier, François Lazeyras (HUG, UNIGE). CHF 8'000 (1.12.2022-1.12.2025).

FUNDING

Swiss National Science Foundation

MRI CHUV-UNIL

CHF 786K

Fetal MRI. This grant covers the salary of the principal investigator and a PhD student. PI: Chris Roy (CHUV-UNIL). CHF 785'660 (2022-2026)

MRI UNIGE

CHF 640K

Advanced MRI for neuroscience of cognition and emotion: From brain circuits to clinical disorders and interventions. The SNSF R'EQUIP grant for the upgrade of the 3T MRI located in the Brain and Behaviour Laboratory was awarded to Patrik Vuilleumier, Dimitri Van de Ville, Sophie Schwartz, Didier Grandjean, David Sander and Frédéric Grouiller. CHF 640'000 (01.2022 - 12.2022).

MRI EPFL

CHF 785K

Developments of innovative fast acquisition and metabolic modelling strategies for clinical and preclinical deuterium MR imaging in the brain at ultra-high field. SNSF Weave/Lead Agency grant covers personnel, consumables, infrastructure costs. PI's are Cristina Cudalbu, Bernard Lanz and Bernard Strasser (Univ of Vienna, Austria) CHF 770'554 (granted 05.2022, started 02.2023)

The International Magnetic Resonance Spectroscopy Workshop "MRS 2022: Overcoming the Barriers to Clinical Use". This grant covers travel allowance for the invited speakers. B Alves, A Klauser, R Kreis, H Lajous, B Lanz, J Mosso, K Pierzchala, D Simicic, D Van de Ville, D Wenz, L Xin. CHF 14'250 (07.2022).

SP CHUV-UNIL

CHF 336K

Deep learning estimation of fiber orientation distribution functions from reduced diffusion-weighted MRI measurements in developing brain. SNSF Post doc mobility. Hamza Kebiri, Meritxell Bach Cuadra. CHF 18'615 (06.22 - 12.22)

Multicentric study of Fetal Abnormal Cortical Trajectory with standardised and privacy-preserving method on fetal MRI, SNSF ERANET grant. PI: E. Eixarch (Hospital Clinic Barcelona, Spain), Co-PI: M. Bach Cuadra, G. Piella (UPF, Spain), D. Rueckert (TUM, Germany), Dr. G. Auzias (Institut Neurosciences la Timone, France). CHF 319'284 (06.22 - 06.25)"

FUNDING

Fondation Gelbert

SP CHUV-UNIL — CHF 196K

A-Eye: an Artificial intelligence large-scale Magnetic Resonance Imaging model of the Eye. Gelbert Foundation. PI: Meritxell Bach Cuadra, Co-PI: Benedetta Franchesciello, S. Langer, O. Stachs, (Rostock University, Germany). CHF 195'598 (04.22 - 04.24).

Fondation Gertrude von Meissner en mémoire d'Annette et Otto Richter

MRI UNIGE — CHF 68K

Teaching children suffering from ADHD to self-regulate their attention through virtual reality and EEG-neurofeedback. The grant covers personnel. PI: Carole Guedj, Frédéric Grouiller, Patrik Vuilleumier (UNIGE). CHF 68'000 (01.22 - 12.23).

FONDATION ISTANJAC

EEG CHUV-UNIL — CHF 364K

Longitudinal study of attention and executive functions in 6-12 year old children in a therapeutic day center. The grant covers personnel, small equipment, participant reimbursement, field expenses. PI : Kerstin von Plessen (CHUV), Micah Murray. CHF364'088 (09.22 - 12.25)

MRI EPFL — CHF 300K

Advancing functional magnetic resonance spectroscopy: towards a sensitive tool targeting neurometabolic alterations. The grant covers personnel, consumables and infrastructure costs. PI: Lijing Xin and Ines Khadimallah (CHUV). CHF 300'000 (02.2023).

FUNDING

HASLERSTIFTUNG

SP CHUV-UNIL

CHF 406K

Explaining AI decisions in personalized healthcare: towards integration of deep learning into diagnosis and treatment planning for Multiple Sclerosis (MSxplain), HASLER RESPONSIBLE AI program. PI: Meritxell Bach Cuadra, Co-PI: Cristina Granziera (Basel University Hostpital), Henning Muller (HES-SO Valais), Adrien Depeursinge (HES-SO, Valais). CHF 405'715 (03.22-03.25).

Fondation ProTechno

SP CHUV-UNIL

CHF 39K

A simulation platform for magnetic resonance imaging of the developing fetal brain (FaBiAN v2.0), ProTechno Foundation grant for personnel, equipment and conference. PI : Hélène Lajous, Meritxell Bach Cuadra. CHF 39'086.5 (02.2022-09.2022).

NOVARTIS | The Novartis Foundation

MRI UNIGE

CHF 79K

Rhythms of conscious perception: Understanding and monitoring attention disorders after stroke in deep brain nuclei (pulvinar). This grant covers personnel. PI: Carole Guedj, Patrik Vuilleumier (UNIGE). 79'000 (03.2022-09.2023).

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

MRI SP EPFL-UNIGE

CHF 609K

Partner to EU PathFinder project MICROVASC. PI : Mickael Tanter, ESPCI Paris. Total funding is EURO 5'390'536, allocated budget CHF 608'692 (10.2022-09.2027)

FUNDING

EEG CHUV-UNIL — CHF 108K

BrainTRACE. The grant covers personnel, small equipment, participant reimbursement, field expenses. PI: Micah Murray (CHUV) and Olivier Collignon (UCLouvain). CHF 108'000 (06.22 – 12.23).

OTHER INVESTORS

MRI EPFL — CHF 15K

Personal Donation for the Oxylite equipment. C. Cudalbu, K. Pierzchala CHF 15'000 (12.2022).

EEG HUG-UNIGE — CHF 500K

EEG-guided personalized modulation of brain activity to improve memory in Alzheimer's Disease. The grant covers 4 research assistants. PI: Christoph Michel (UNIGE). CHF 500'000 (1.11.2022-30.9.2024).

THANK YOU FOR SUPPORTING US

TEACHING

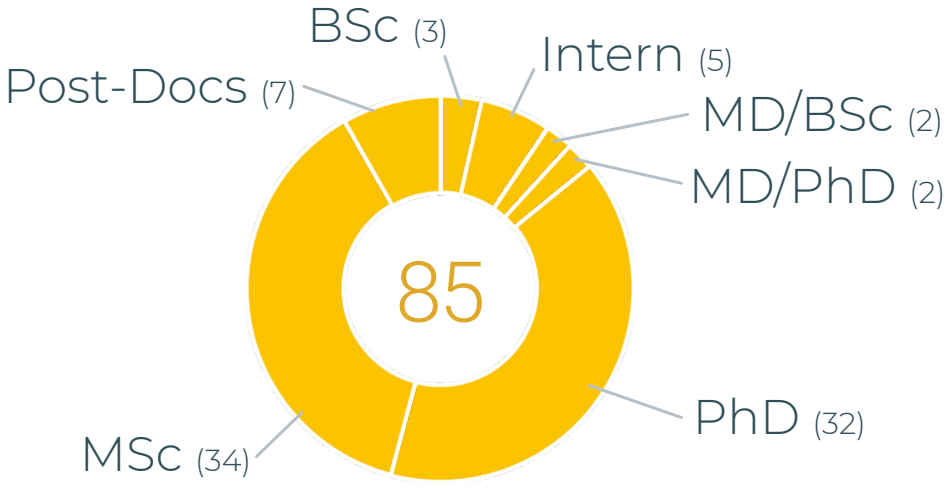
SUMMARY

CIBM is strongly committed to disseminating knowledge in the Center's four modules (EEG, MRI, PET, and SP). Our Core Members run graduate and undergraduate courses and deliver lectures at the Faculty of Biology and Medicine, UNIL, the Faculty of Medicine, UNIGE, the Faculty of Basic Sciences, EPFL, and the Faculty of Engineering, EPFL. However, our educational activities go beyond knowledge sharing; CIBM is also training new talent. By supervising post-doctoral researchers and doctoral, graduate, and undergraduate students, and coaching interns, we are grooming the academic leaders of tomorrow, contributing to the growth of the research community in the Lemanic Region.

The CIBM Core Members are selected to give seminars and lectures at global conferences for instance the Cognitive Neuroscience Society (CNS), the International Society for Magnetic Resonance in Medicine (ISMRM), The Medical Image Computing and Computer Assisted Intervention Society (MICCAI), Organization for Human Brain Mapping (OHBM) and the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP).

Sharing of CIBM research and experience is encouraged through the monthly Breakfast and Science Seminar Series. A total of 9 hybrid seminars with 12 speakers, including 4 PhD students during the summer edition.

SUPERVISION



B&S SEMINARS

BREAKFAST & SCIENCE
SEMINAR SERIES 2022

A total of 9 monthly meetings occurred which allowed the CIBM community to exchange and share their research activity.

#21 - January

How molecular imaging has changed our understanding of dementia

Valentina Garibotto,
Division of Nuclear Medicine and Molecular Imaging, Diagnostic Department, HUG. NIMTLab, Radiology Department, Faculty of Medicine, UNIGE. CIBM PET HUG UNIGE Section Head.

#22 - February

Emotion dynamics: the brain at unrest

Patrik Vuilleumier,
Dept of Neuroscience (NEUFO), Faculty of Medicine, University of Geneva. Swiss Affective Science Center (CISA), University of Geneva. CIBM MRI UNIGE Cognitive and Affective Neuroimaging Section Head.

#23 - March

Stability of image reconstruction algorithms

Pol del Aguila Pla,
Research Staff Scientist, CIBM SP EPFL Mathematical Imaging Section & Post-doctoral researcher, Biomedical Imaging Group, School of Engineering, EPFL.

#24 - April

Imaging a Moving Target: Fetal and Pediatric Cardiovascular MRI

Christopher Roy,
Maître assistant (SNSF Ambizione), Department of Radiology – Lausanne University Hospital (CHUV), University of Lausanne (UNIL).

B&S SEMINARS

BREAKFAST & SCIENCE
SEMINAR SERIES 2022

#25 - May

Combining EEG microstates with machine learning to identify brain states and traits.

Tomas Ros,
Research Staff Scientist CIBM EEG (HUG-UNIGE).

#26 - June (Summer edition)

Deep learning methods for fetal brain MRI tissue segmentation.

Priscille Guerrier de Dumast, *PhD student MIAL UNIL & CIBM SP CHUV-UNIL*

Fast in vivo assay of creatine kinase in human brain by 31P magnetic resonance fingerprinting

Mark Widmaier, *PhD student LIFMET EPFL & CIBM MRI EPFL*

#27 - July (Summer edition)

Compartmentalized model of permeable cell tissue for microstructure estimation from DW-MRI signals

Rémy Gardier, *PhD student EPFL & CIBM SP CHUV-EPFL*

Perinatal brain damage: consequences of prematurity and birth asphyxia

Marion Décaillet, *PhD student UNIL & CIBM EEG CHUV-UNIL*

#28 - September

Brain regional vulnerability in the rat brain during type C hepatic encephalopathy: from metabolic to cellular scale

Dunja Simicic,
Research Staff Scientist, CIBM MRI EPFL

#29 - October

Unravelling multisensory processes with high-field fMRI

Anna Gaglianese,
Marie Curie Fellow, Laboratory for Investigative Neurophysiology (LINE), Department of Radiology, CHUV, Lausanne, Switzerland.

SERVICE

SUMMARY

CIBM contributes to the local and international scientific research community by providing access and expertise to users of its infrastructure.

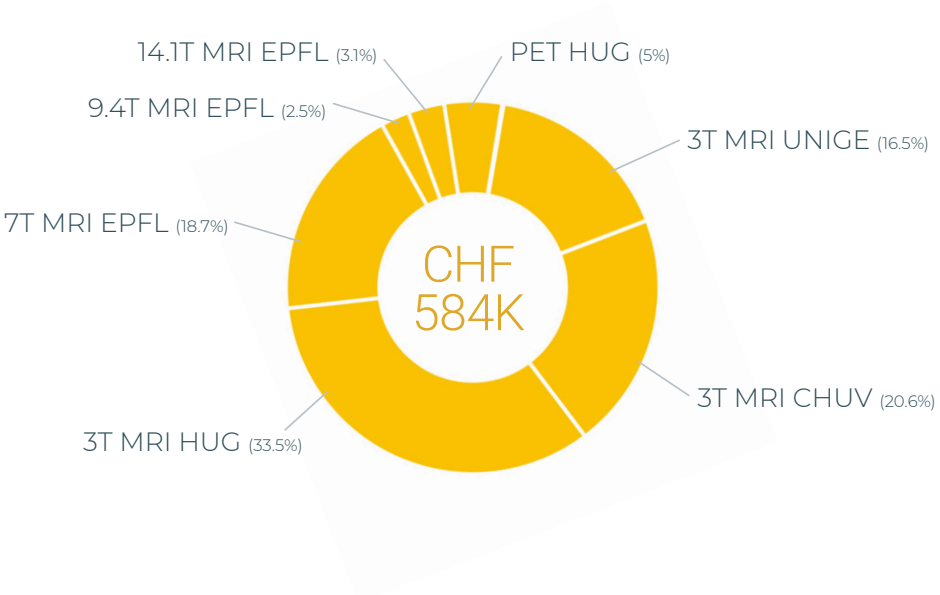
Services provided by CIBM Core Members include: advice on project feasibility, practical training on use of the equipment and safety rules, set-up of protocols and experiments, data acquisition and analysis, as well as, data management.

Support relating to MRI and PET/CT infrastructure are listed below:

- Set-up of fMRI paradigms (software and hardware)
- Sequence development
- Spectroscopy acquisition, analysis and interpretation
- Supervision and analysis of MR spectroscopy and fMRI for clinical diagnosis or presurgical evaluation
- Advice and administration of the regulatory and ethical requirements in accordance to Swiss law on human research and animal experimentation
- Provision of professional radiographers for clinical trials
- Provision of veterinarians and animal physiologists for pre-clinical trials
- Site accreditation including Quality Assurance scans for multicentric studies
- Supervising and analysing MR spectroscopy and fMRI for clinical diagnosis or presurgical evaluation.

New resources and infrastructure comprising software, datasets and hardware were also made available to the CIBM Community.

REVENUE FROM INFRASTRUCTURE



OUTREACH AND RECOGNITION

SUMMARY

In 2022, the CIBM Center for Biomedical Imaging engaged in a wide array of significant events, collaborations, and advancements, demonstrating its commitment to the field of biomedical imaging.

From January to March, the CIBM hosted the 16th Alpine Brain Imaging Meeting (ABIM'2022) in Champéry, which featured international speakers and focused on topics such as language development and consciousness. The CIBM Breakfast and Science Seminar Series was launched by Professor Valentina Garibotto, with notable talks by Professor Patrik Vuilleumier. During this period, EPFL master's students visited the CIBM MRI EPFL facility to learn about biomedical imaging.

In April, Dr. Valerio Zerbi joined CIBM through an SNSF Eccellenza Professorial Fellowship, enhancing the research capabilities at EPFL. In May, the EPFL Research Office and a group of middle school students visited CIBM, gaining insights into its research activities and infrastructure. Undergraduate students from UNIL's Faculty of Biology and Medicine resumed their annual visits to CIBM MRI EPFL in late May. The inauguration of a new MAGNETOM Prisma Fit 3T MRI scanner at the University Medical Center in Geneva was a key highlight in early June.

During the summer, the International Magnetic Resonance Spectroscopy Workshop "MRS 2022" took place at EPFL, uniting researchers to discuss the latest advancements in MRS. The annual CIBM-CHUV-MR Retreat focused on cardiovascular disease research, bringing together basic scientists, clinical scientists, and industry representatives. In September, CIBM visited the In-Vivo Imaging Facility in AGORA to share expertise in MRI for tumor imaging.

In the final quarter of the year, CIBM and the Swiss Center for Affective Sciences won the prestigious "Innovation Award 2022" for a virtual classroom project aimed at helping children with attention deficit disorder. Excitement surged in November when Raphaël Liégeois from CIBM the EPFL Medical Image Processing Lab (MIPLAB) headed by Prof. Dimitri Van De Ville was selected as an ESA astronaut candidate.

The CIBM Annual Symposium and the inauguration of the new 7T MRI Scanner at Campus Biotech Geneva in late November brought together 200 participants to discuss the latest developments in biomedical imaging. The year concluded with Dr. Dunja Simicic receiving the EPFL Physics Doctoral Thesis Award for her outstanding research on advanced metabolite mapping.

Throughout 2022, CIBM's diverse activities and achievements highlighted its dedication to advancing biomedical imaging research, fostering collaborations, and engaging with both the scientific community and and the public.

NEWS & EVENTS

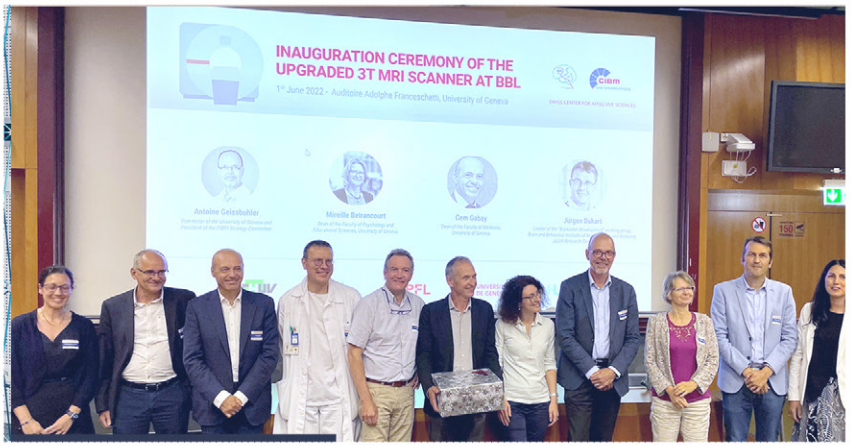
JAN	– Alpine Brain Imaging Meeting, ABIM'2022.
FEB	– Meet two new members in CIBM's Leadership team.
MAR	– First post-pandemic activities: EPFL graduate students visit CIBM. – CIBM at the Brain Week in Lausanne.
APR	– CIBM welcomes Dr. Valerio Zerbi through an SNSF Eccellenza Professorial Fellowship award.
MAY	– EPFL Research Office visits CIBM MRI EPFL Animal Imaging and Technology Section. – Middle school students discover the field of biomedical imaging at CIBM MRI CHUV-UNIL. – UNIL FBM undergraduate students resume their annual visits to CIBM MRI EPFL.
JUN	– BBL-CIBM-FCBG Research Day 2022. – CIBM inauguration of the newly installed 3T MRI scanner at the BBL.
JUL	– Arrival of the full body Siemens Healthineers MAGNETOM Terra 7 Tesla MRI scanner at the Campus Biotech Geneva.
AUG	– Highlights from the International MRS Workshop 2022.
SEP	– CIBM-CHUV-MR Retreat 2022. – CIBM visits the In-Vivo Imaging Facility in AGORA.
OCT	– Swiss Center for Affective Sciences and CIBM win the prestigious "Innovation Award 2022".
DEC	– Astronomical pride for CIBM – Dr. Raphaël Liégeois selected as career astronaut of ESA 2022 Class. – Highlights from CIBM Annual Symposium 2022 and Inauguration of the new 7T MRI Scanner. – CIBM researcher Dr. Dunja Simicic receives the EPFL Physics Doctoral Thesis Award 2022.


CIBM
Center for Biomedical Imaging

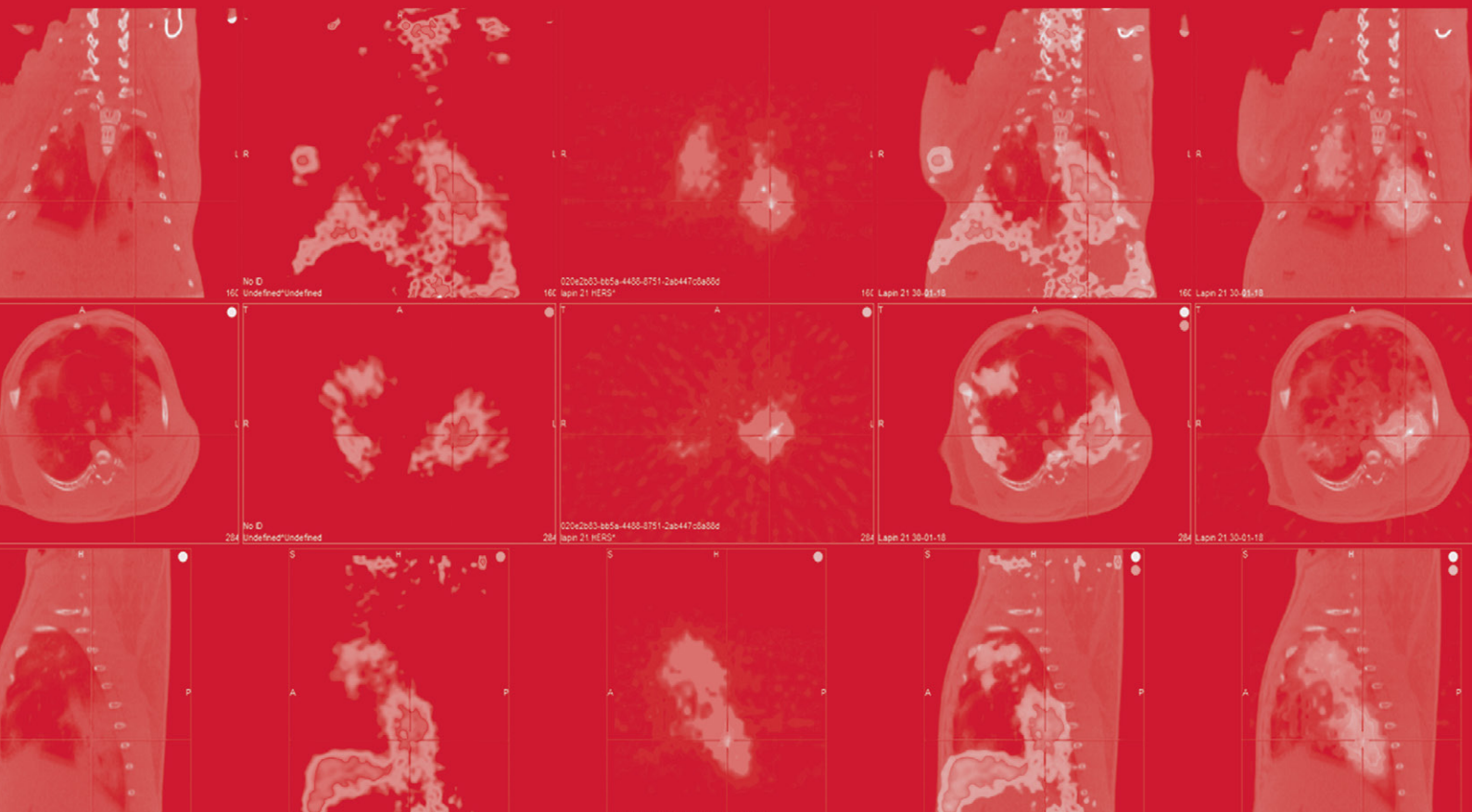

MRS Workshop 2022


8th CIBM-CHUV-MR Retreat


JOURNÉE DE L'INNOVATION
CENTRE DE L'INNOVATION DES HUG


INAUGURATION CEREMONY OF THE
UPGRADED 3T MRI SCANNER AT BBL

OBJECTIVES 2023



SUMMARY

In 2023, we are excited to embark on several transformative initiatives. First, this will be the year of important changes in the scientific steering committee. We will begin to seek for new leadership to our EEG and MRI teams across Geneva and Lausanne.

We will kick off the Flywheel pilot phase, aiming to revolutionize our data management and analysis capabilities. To streamline project initiation, we will develop an online application form for new human MRI and pre-clinical imaging research projects together with a uniformed and homogenized booking software across institutions.

A significant milestone will be the inauguration of our new Low Field MRI at CHUV, expanding our imaging capabilities.

Engaging the scientific community and to fuel our thinking and broaden our scientific impact, we will launch the 7T MRI Seminar Series and initiate the 7T MRI R&D meetings at Campus Biotech Geneva. Finally, we will introduce the CIBM Visitors Talk series, creating a platform for knowledge exchange and inspiring discussions.

Finally, our ambitious CIBM Flagship Project will take shape this year, setting the stage for groundbreaking research and innovation in the coming years.

These objectives reflect our commitment to advancing technology, fostering collaboration, and driving innovation in imaging research.

ALUMNI

Since 2004, a large number of Core Members have contributed to and benefited from the success of the CIBM.

Ahmed Abdulkadir
Markus Adriany
Malte Alf
Erkin Ali Arslan
Nicolas Aznavour
Maryna Babayeva
Laure Bardoullet
Jessica Bastiaansen
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Corina Berset
Andrea Biasiucci
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Boris Zuber

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Support CIBM

CIBM welcomes contributions from corporations, foundations and individuals to nurture excellence in biomedical imaging. For more information and updates on CIBM partnership opportunities, please visit: www.cibm.ch and contact the Executive Director at execdir@cibm.ch.

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This report was designed and edited by Martel Innovate.


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