2021 EDITION

ANNUAL REPORT

Department of Biomedical Sciences UNIPD

DIPARTIMENTO DI SCIENZE BIOMEDICHE

1222 · 2022 800 ANNI

UNIVERSITÀ DEGLI STUDI DI PADOVA

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DSB IN NUMBERS

All data presented in this chapter refer to the Department's picture as of December 31st 2021.

Data related to staff members and funding were provided by the Department's administration. Data on funding include **research projects of competitive funding calls** and **University-Business collaborations.**

The following statistics purposely exclude activities and personnel traceable to our Department's research groups/members that are managed by third parties so as to streamline the data collection process. These third parties are namely:

- The Veneto Institute of Molecular Medicine (VIMM)
- CRIBI Biotechnology Center
- The National Research Council of Italy (CNR)
- Human Inspired Technology Research Centre (HIT)
- Padova Neuroscience Center (PNC)
- Myology Center (CIR-Myo)
- Istituto di Ricerca Pediatrica Città della Speranza (IRP)

Data on publications were retrieved from the **repository IRIS** using the list of permanent staff members (*personale strutturato*) of the Department.. The process is automatized and data was retrieved on February 9th, 2022 searching simultaneously for the following criteria: field "year" is "2021"; field "authors"

includes DSB permanent staff members; and field "type" is "01.01 - Articolo in rivista"

Staff

Staff categories	Nr.
PhD students	46
Research Fellows (Borsisti)	58
Postdoc (Assegnisti)	76
Research Assistants (tecnici)	21
Administrative Assistants	24
Researchers	35
Associate Professors	32
Full Professors	13
TOT.	**305**

104

EARLY STAGE RESEARCHERS[1]

177

EXPERIENCED RESEARCHERS[2]

[1] *Early Stage Researchers* are defined as those who are in the first four years (or full time equivalent) of their research careers, starting from when they obtained a degree entitling them to embark on a PhD program.

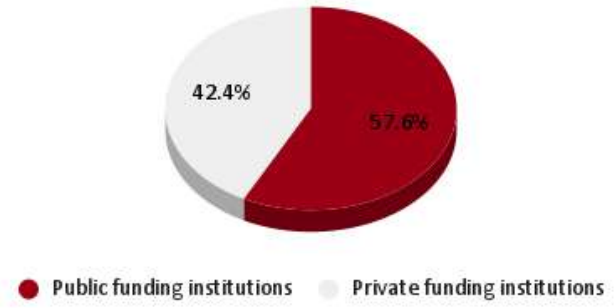
[2] *Experienced Researchers* are either in possession of a doctoral degree or have at least four years of research experience (full-time equivalent).

Funding

In 2021 the overall funding value of the DSB was **€ 19,751,233.46**, including active research projects[3] granted through competitive calls and University-Business collaborations.

The great majority of this amount (€ 19,325,383.21, 97.8%) comes from funded research projects awarded to the Department's permanent personnel. Only 2.2% of the overall funding available in the Department (equal to €425,850.25) derives from University-Business collaborations.

Research Projects



The main source of funding of 2021 was the **public sector** with **€11,132,686.18** (57.6%), against the €8,192,697.03 (42.4%) allocated by private institutions.

Our main funders are **Italian private institutions** (e.g. AIRC, Telethon, CARIPARO) providing **32.1%** of our budget, followed closely by the European Commission (31.6%). From Italian public institutions (mainly the Ministry of University and Research) we receive 16.5% of funding, from International private institutions 9.8%. Noticeably, the University of Padova funds several projects in our Department, reaching 6.9% of our overall budget. Minor funders are also Intergovernmental organizations (3.2%).

[3] This value is the sum of the overall funding assigned to all the projects active in 2021, disregarding the fact that the project duration might be longer than that specific year.

Projects started in 2021

In 2020 our Department was awarded nineteen projects, for an overall value of **€ 3,018,408.86**, including four MSCA Individual Fellowships and three PRIN projects.

Funding institution	Project type	N. projects
European Commission	MSCA IF	4
Italian public institutions	PRIN	3
Italian private institutions	Telethon	2
Intergovernmental organizations	EMBL-EBI	2
International private institutions	Kennedy's Disease Association	1
Italian private institutions	AIRC	1
International private institutions	Cure Alzheimer's Fund	1
UNIPD	MSCA SoE	1
Italian public institutions	FISR	1
Italian public institutions	FESR	1
UNIPD	POC UNIPD	1
Italian private institutions	Fondazione Human Technopole	1
total		**19**

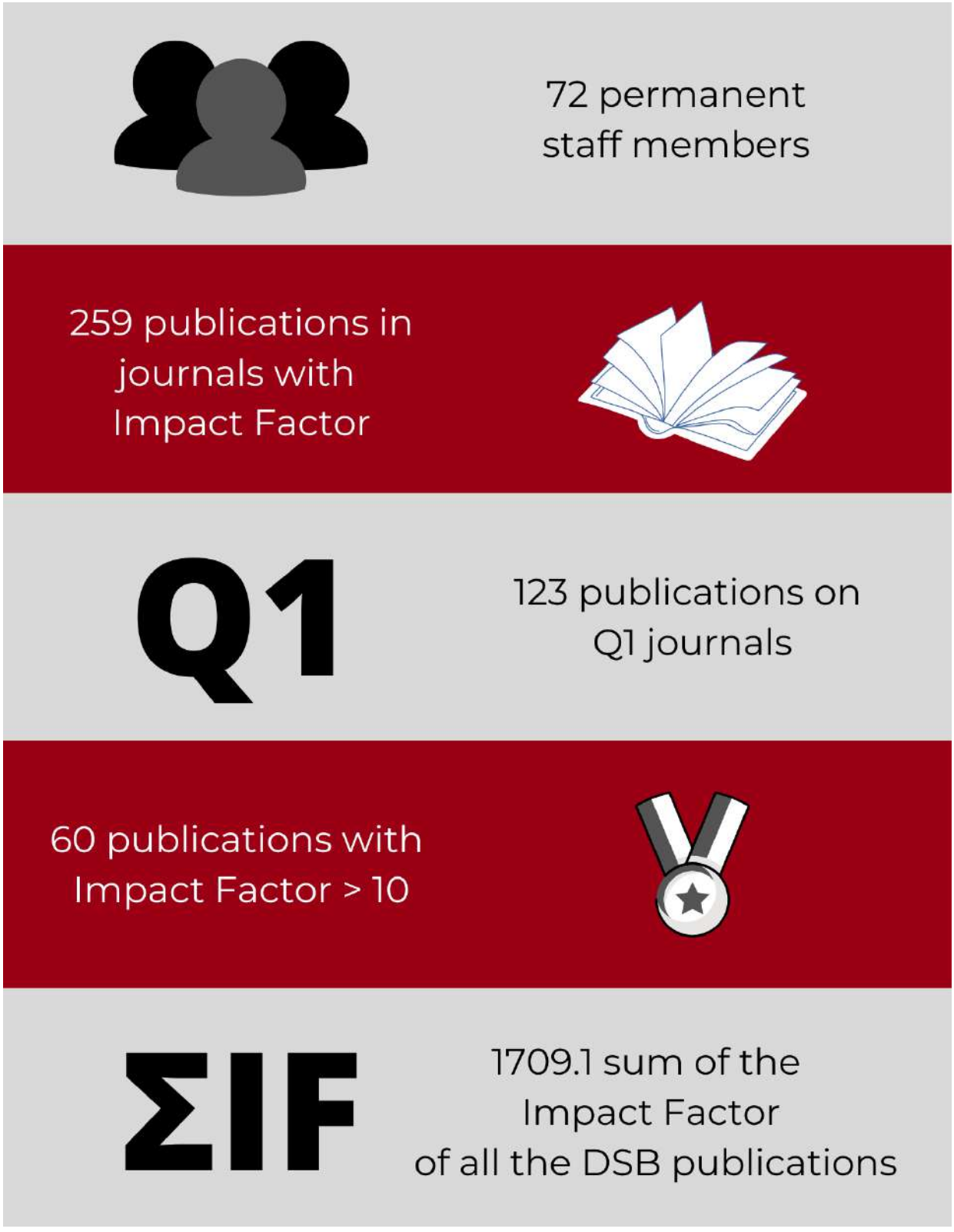
+3,018,408.86 €

Active projects in 2021

In 2021 our department hosted eighty-two ongoing research projects that started between 2016 and 2021 for an overall value of **€ 19,325,383.21**. PRIN projects were the most numerous (15), followed by AIRC (8) and MSCA - Individual Fellowship (7).

Funding institution	Project type	N. projects	Total/Funding institution	%
European Commission	MSCA RISE	2	€6,102,248.59	31.58%
	FET	2		
	MSCA IF	7		
	MSCA ITN	1		
	INFRADEV (RIA)	1		
	CSA	1		
	ERC	1		
Intergovernmental organizations	ESA	1	€611,726.05	3.17%
	Office of Naval Research (ONR)	1		
	Children's Tumor Foundation (CTF)	2		
	EMBL-EBI	4		
International private institutions	Fondazione Leducq	2	€1,896,214.03	9.81%
	MDA	1		
	AFM Telethon	3		
	DAN Europe Foundation	1		
	Kennedy's Disease Association	1		
	Cure Alzheimer's Fund	1		
Italian private institutions	CARIPLO	1	€6,202,606.00	32.10%
	CARIPARO	5		
	AIRC	8		
	Telethon	4		
	Fondazione Human Technopole	1		
Italian public institutions	ASI	3	€3,182,888.54	16.47%
	PRIN	15		
	Ricerca sanitaria finalizzata	2		
	FISR	1		
	FESR	1		
UNIPD	STARS	6	€1,329,700.00	6.88%
	MSCA SoE	2		
	POC UNIPD	1		
Total		**82**	**€19,325,383.21**	**100%**

Publications



RESEARCH

Research areas

Research at the Department of Biomedical Science spans a wide array of areas including:

- ✧ Cell Signaling
- ✧ Computational and Structural Biology
- ✧ Inflammation and Immunity
- ✧ Medical Biotechnology
- ✧ Mitochondrial Pathophysiology
- ✧ Muscle Physiology in Health and Disease
- ✧ Neuroscience
- ✧ Physical Activity and Health

Below are the tables of all the laboratories associated with each research area and the related Principal Investigator/s (PI).

Cell Signaling

Laboratories	***PI***
Ca2+ and cAMP signaling in physiology and pathology	Prof. P. Pizzo
Pharmacobiology of Natural Compounds	Dr. L. Biasutto
Phosphorylation Signaling in Health and Disease	Prof. M. Ruzzene
Post-transcriptional gene regulation in cancer cells	Dr. D.M. D'Agostino
Redox Signaling in Pathophysiological Conditions	Prof. M.P. Rigobello

Computational and Structural Biology

Laboratories	***PI***
BioComputing UP	Prof. S.C.E. Tosatto
Protein crystallography and cryoEM	Prof. R. Steiner
Protein interactions and dynamics	Prof. M. Fuxreiter

Inflammation and Immunity

Laboratories	***PI***
Inflammation and Immunity	Prof. A. Viola

Medical Biotechnology

Laboratories	***PI***
Extracellular Matrix (Ecm) Pathobiology	Prof. M. Onisto
Immune nano-technology	Dr. L.G. Delogu
Mass Spectrometry and Proteomics	Prof. G. Arrigoni
Nano-biotechnology and nano-biomedicine	Prof. E. Papini
Peptides and Antibodies	Prof. O. Marin

Protein engineering	Prof. A. Negro

Mitochondrial Pathophysiology

Laboratories	***PI***
Mitochondria in Cell Death and Cancer	Prof. P. Bernardi/ Prof. A. Rasola
Mitochondrial Calcium Signaling	Prof. R. Rizzuto
Mitochondrial medicine	Prof. C.F. Viscomi
Molecular mechanisms of aging	Prof. M. Giorgio
Oxidative metabolism in cardiac disease	Prof. F. Di Lisa
Regulation of the Mitochondrial Proteome	Prof. G. Szabadkai

Muscle Physiology in Health and Disease

Laboratories	***PI***
Autonomic Control of Cardiac Function	Prof. M. Mongillo
Chaperones in Muscle Differentiation and Disease	Prof. L. Gorza
Muscle Contractility And Plasticity	Prof. M. Narici
Pathophysiology of Striated Muscles	Prof. P. Volpe
Signaling pathways that control protein homeostasis in muscles	Prof. M. Sandri
Paolocci's lab	Prof. Paolocci

Neuroscience

Laboratories	***PI***
Circuit formation and function in the brain	Dr. C. Lodovichi
Enlightening Brain Mechanisms	Dr. M. Dal Maschio

Genetics of focal epilepsies	Dr. E. Dazzo
Migraine Pathophysiology	Prof. Pietrobon
Molecular and cellular mechanisms of neurodegenerative and neuromuscular diseases	Prof. A. Bertoli
Neuronal networks physiology and neurotechnologies (NeuroChip lab)	Prof. S. Vassanelli
Neuron-glia signaling in brain function and dysfunction	Dr. P. Carmignoto
Neuroparalysis and Neuroregeneration Lab	Prof. O. Rossetto
Pathogenesis of neurological and neuromuscular diseases	Prof. M. Pennuto
Plasticity In Pathology	Prof. M. Caleo

Physical Activity and Health

Laboratories	***PI***
Nutrition and Exercise Lab (NUTEXlab)	Prof. A. Paoli

Research groups

The tables below illustrate the activities of the DSB research groups, taking into consideration parameters such as staff members, publications, funded projects and University-Business collaborations as of December 31st 2021.

The list of **keywords** on each group's research field were taken from the Principal Investigator's ORCID profile, whenever available, or suggested by the PI.

The **members** of each group include:

a) permanent staff ("*personale strutturato"*), reported based on data provided by the Director's Office.
b) non-permanent staff ("personale non strutturato) active as of December 31st 2021 or contractualized for at least 3 months during the reference period.
c) collaborators working at the premises of the Department for at least 75% of their work effort and suggested by the PI.
d) PhD students from all PhD programmes, as suggested by the PI.

The list of **research projects** was provided by the Department's Research Office and refers to competitive projects granted to a member of the research group and directly managed by the Department in 2021. Activities managed by third parties were purposely excluded, with the underlying intention of streamlining the data collection process and the statistics. Among these third parties are:

- The Veneto Institute of Molecular Medicine (VIMM)
- CRIBI Biotechnology Center
- The National Research Council of Italy (CNR)
- Human Inspired Technology Research Centre (HIT)
- Padova Neuroscience Center (PNC)
- Myology Center (CIR-Myo)

- Istituto di Ricerca Pediatrica Città della Speranza (IRP)
- Other foundations

University-Business collaborations are listed based on data provided by the Department's Research Office.

The list of publications was compiled by searching the **repository IRIS** for the publications of the Department's permanent staff members (*personale strutturato*). The process is automatized and data was retrieved on February 9th, 2022 searching simultaneously for the following criteria:

- field "year" is "2021"
- field "authors" includes DSB permanent staff members
- field "type" is "01.01 - Articolo in rivista"

For information and data on CNR affiliates please refer to the CNR affiliate's website, linked in their related tables.

Cell Signaling

1 - Ca2+ and cAMP signaling in physiology and pathology

Principal Investigator	Prof. Paola Pizzo ORCID https://orcid.org/0000-0001-6077-3265 Scopus 35597536700 WoS ID T-4874-2018 Google Scholar Paola Pizzo
Contact	paola.pizzo@unipd.it 049 827 6067 website
Keywords	Neurodegeneration; Aging; Calcium Homeostasis; Mitochondrial function; Neuroscience; Neurobiology and Brain Physiology; Alzheimer's Disease; Genetically Encoded Ca2+ Probes; Signal transduction; cAMP signaling
Members	Pizzo Paola — Associate Professor Tullio Pozzan — Professor Emeritus Basso Emy — CNR researcher Di Benedetto Giulietta — CNR researcher Filadi Riccardo — CNR researcher Greotti Elisa — CNR researcher Pendin Diana — CNR researcher Surdo Nicoletta — CNR researcher Fasolato Cristina — Researcher Mendes Pereira Magalhães P.Jorge — Research Assistant Fornetto Chiara — Postdoc García Casas Paloma — Postdoc Redolfi Nelly — Postdoc Arnst Nikita — PhD Student Barazzuol Lucia — PhD Student Rossini Michela — PhD Student Sonda Sonia — PhD Student
Research projects	- *A shape to fit the needs: how cells rearrange their organelle composition and architecture during development and stress* (PRIN) - *Early dysfunctions of intercellular signalling in brain disorders* (PRIN - Pozzan/Fasolato) - *Extracellular ATP Is a Key Factor in Promoting Alzheimer's Disease Neuroinflammation* (Cure Alzheimer's Fund) - *HEARTzheimer* (MSCA SoE - Ciocci Pardo)

Publications	Galla, Luisa, Nicola Vajente, Diana Pendin, Paola Pizzo, Tullio Pozzan, and Elisa Greotti. 2021. 'Generation and Characterization of a New FRET-Based Ca2+ Sensor Targeted to the Nucleus'. International Journal of Molecular Sciences 22 (18): 9945. https://doi.org/10.3390/ijms22189945 Klionsky, Daniel J., Amal Kamal Abdel-Aziz, Sara Abdelfatah, Mahmoud Abdellatif, Asghar Abdoli, Steffen Abel, Hagai Abeliovich, et al. 2021. 'Guidelines for the Use and Interpretation of Assays for Monitoring Autophagy (4th Edition) 1'. Autophagy 17 (1): 1–382. https://doi.org/10.1080/15548627.2020.1797280 Naia, Luana, Catarina M. Pinho, Giacomo Dentoni, Jianping Liu, Nuno Santos Leal, Duarte M. S. Ferreira, Bernadette Schreiner, et al. 2021. 'Neuronal Cell-Based High-Throughput Screen for Enhancers of Mitochondrial Function Reveals Luteolin as a Modulator of Mitochondria-Endoplasmic Reticulum Coupling'. BMC Biology 19 (1): 57. https://doi.org/10.1186/s12915-021-00979-5 Pizzo, Paola. 2021. 'Cell Calcium'. Cell Calcium 96 (June): 102370. https://doi.org/10.1016/j.ceca.2021.102370 Plotegher, Nicoletta, Riccardo Filadi, Paola Pizzo, and Michael R. Duchen. 2021. 'Excitotoxicity Revisited: Mitochondria on the Verge of a Nervous Breakdown'. Trends in Neurosciences 44 (5): 342–51. https://doi.org/10.1016/j.tins.2021.01.001 Redolfi, Nelly, Paloma García-Casas, Chiara Fornetto, Sonia Sonda, Paola Pizzo, and Diana Pendin. 2021. 'Lighting Up Ca2+ Dynamics in Animal Models'. Cells 10 (8): 2133. https://doi.org/10.3390/cells10082133 Redolfi, Nelly, Elisa Greotti, Giulia Zanetti, Tino Hochepied, Cristina Fasolato, Diana Pendin, and Tullio Pozzan. 2021. 'A New Transgenic Mouse Line for Imaging Mitochondrial Calcium Signals'. Function 2 (3): zqab012. https://doi.org/10.1093/function/zqab012 Rossi, Alice, Luisa Galla, Chiara Gomiero, Lorena Zentilin, Mauro Giacca, Valentina Giorgio, Tito Calì, Tullio Pozzan, Elisa Greotti, and Paola Pizzo. 2021. 'Calcium Signaling and Mitochondrial Function in Presenilin 2 Knock-Out Mice: Looking for Any Loss-of-Function Phenotype Related to Alzheimer's Disease'. Cells 10 (2): 204. https://doi.org/10.3390/cells10020204 Rossini, Michela, Paloma García-Casas, Riccardo Filadi, and Paola Pizzo. 2021. 'Loosening ER–Mitochondria Coupling by the Expression of the Presenilin 2 Loop Domain'. Cells 10 (8): 1968. https://doi.org/10.3390/cells10081968

2 - Pharmacobiology of Natural Compounds

Principal Investigator	Dr. Lucia Biasutto ORCID https://orcid.org/0000-0002-7638-6865 Scopus 15829089100
Contact	lucia.biasutto@cnr.it 049 827 6055 website
Keywords	Flavonoids; Medicinal and Pharmaceutical Chemistry; Chromatography; Nutraceuticals; Polyphenols; High-Performance Liquid Chromatography; Metabolite Identification; Sample Preparation; Mass Spectrometry; LC-MS
Members	Biasutto Lucia — CNR researcher Parrasia Sofia — PhD Student
Research projects	Information on Biasutto's research activities and publications are available at: http://www.in.cnr.it/index.php/it/9-people/48-lucia-basutto
Publications	

3 - Phosphorylation Signaling in Health and Disease

Principal Investigator	Prof. Maria Ruzzene ORCID https://orcid.org/0000-0001-8712-8151 Scopus 7006366475 Google Scholar Maria Ruzzene
Contact	maria.ruzzene@unipd.it 049 827 6112 website
Keywords	Cancer Cells; Cancer Biology; Phosphorylation; Apoptosis; Signaling Pathways; Signal Transduction; Cancer Research; Cell Biology; Proteins; Cell Signaling
Members	Ruzzene Maria — Associate Professor Salvi Mauro — Associate Professor Sarno Stefania — Researcher Borgo Christian — Research Associate (RTDa) Cesaro Luca — Research Assistant Quezada Meza Camila Paz — PhD Student
Publications	Borgo, Christian, Luca Cesaro, Tsuyoshi Hirota, Keiko Kuwata, Claudio D'Amore, Thomas Ruppert, Renata Blatnik, Mauro Salvi, and Lorenzo A. Pinna. 2021. 'Comparing the Efficacy and Selectivity of Ck2 Inhibitors. A Phosphoproteomics Approach'. European Journal of Medicinal Chemistry 214 (March): 113217. https://doi.org/10.1016/j.ejmech.2021.113217 Borgo, Christian, Claudio D'Amore, Luca Cesaro, Stefania Sarno, Lorenzo A. Pinna, Maria Ruzzene, and Mauro Salvi. 2021. 'How Can a Traffic Light Properly Work If It Is Always Green? The Paradox of CK2 Signaling'. Critical Reviews in Biochemistry and Molecular Biology 56 (4): 321–59. https://doi.org/10.1080/10409238.2021.1908951 Borgo, Christian, Claudio D'Amore, Stefania Sarno, Mauro Salvi, and Maria Ruzzene. 2021. 'Protein Kinase CK2: A Potential Therapeutic Target for Diverse Human Diseases'. Signal Transduction and Targeted Therapy 6 (1): 183. https://doi.org/10.1038/s41392-021-00567-7 D'Amore, Claudio, Christian Borgo, and Mauro Salvi. 2021. 'A Mutational Approach to Dissect the Functional Role of the Putative CFTR "PTM-CODE"'. Journal of Cystic Fibrosis 20 (5): 891–94. https://doi.org/10.1016/j.jcf.2021.03.010 D'Amore, Claudio, and Mauro Salvi. 2021. 'Editorial of Special Issue "Protein Post-Translational Modifications in Signal Transduction and Diseases"'. International Journal of Molecular Sciences 22 (5): 2232. https://doi.org/10.3390/ijms22052232 Salvi, Mauro, Christian Borgo, Lorenzo A. Pinna, and Maria Ruzzene. 2021. 'Targeting CK2 in Cancer: A Valuable Strategy or a Waste of Time?' Cell Death Discovery 7 (1): 325. https://doi.org/10.1038/s41420-021-00717-4

	Zonta, Francesca, Christian Borgo, Camila Paz Quezada Meza, Ionica Masgras, Andrea Rasola, Mauro Salvi, Lorenzo A. Pinna, and Maria Ruzzene. 2021. 'Contribution of the CK2 Catalytic Isoforms α and α' to the Glycolytic Phenotype of Tumor Cells'. Cells 10 (1): 181. https://doi.org/10.3390/cells10010181 Borgo, Christian and Maria Ruzzene. 2021. 'Protein kinase CK2 inhibition as a pharmacological strategy.' Advances in Protein Chemistry and Structural Biology 124:23-46.. https://doi.org/10.1016/bs.apcsb.2020.09.003

4 - Post-transcriptional gene regulation in cancer cells

Principal Investigator	Dr. Donna Mia D'Agostino ORCID https://orcid.org/0000-0002-3451-5622 Scopus 7005814670 WoS ID AAW-1765-2021
Contact	dm.dagostino@unipd.it 049 821 5886
Keywords	T-cell leukemia, complex retrovirus, noncoding RNA, alternative splicing, circulating biomarkers
Members	D'Agostino Donna Mia Researcher
Publications	Cavallari, Ilaria, Francesco Ciccarese, Evgeniya Sharova, Loredana Urso, Vittoria Raimondi, Micol Silic-Benussi, Donna M. D'Agostino, and Vincenzo Ciminale. 2021. 'The MiR-200 Family of MicroRNAs: Fine Tuners of Epithelial-Mesenchymal Transition and Circulating Cancer Biomarkers'. Cancers 13 (23): 5874. https://doi.org/10.3390/cancers13235874 Todeschini, Paola, Elisa Salviato, Chiara Romani, Vittoria Raimondi, Francesco Ciccarese, Federico Ferrari, Germana Tognon, et al. 2021. 'Comprehensive Profiling of Hypoxia-Related MiRNAs Identifies MiR-23a-3p Overexpression as a Marker of Platinum Resistance and Poor Prognosis in High-Grade Serous Ovarian Cancer'. Cancers 13 (13): 3358. https://doi.org/10.3390/cancers13133358

5 - Redox Signaling in Pathophysiological Conditions

Principal Investigator	Prof. Maria Pia Rigobello ORCID https://orcid.org/0000-0003-2586-3251 Scopus 7003633359 Google Scholar Maria Pia Rigobello
Contact	mariapia.rigobello@unipd.it 049 827 6138 website
Keywords	Glutathione; Antioxidants; Oxidative Stress; Reactive Oxygen Species; Redox Regulation; Free Radicals; Antioxidant Activity; Free Radical Biology; MDA; Apoptosis;
Members	Rigobello Maria Pia — Associate Professor Folda Alessandra — Research Assistant Scalcon Valeria — Postdoc Tonolo Federica — Postdoc
Research projects	- *Cibo intelligente per un futuro sostenibile* (FESR)
IP Exploitation & services	- *PRIX QUALITY SPA Rep. 39/2020 per "Informazioni nutrizionali ad uso del consumatore per l'Azienda Supermercato Prix"*
Publications	Hyeraci, Mariafrancesca, Valeria Scalcon, Alessandra Folda, Luca Labella, Fabio Marchetti, Simona Samaritani, Maria Pia Rigobello, and Lisa Dalla Via. 2021. 'New Platinum(II) Complexes Affecting Different Biomolecular Targets in Resistant Ovarian Carcinoma Cells'. ChemMedChem 16 (12): 1956–66. https://doi.org/10.1002/cmdc.202100075 Moretto, Laura, Federica Tonolo, Alessandra Folda, Valeria Scalcon, Alberto Bindoli, Marco Bellamio, Emiliano Feller, and Maria Pia Rigobello. 2021. 'Comparative Analysis of the Antioxidant Capacity and Lipid and Protein Oxidation of Soy and Oats Beverages'. Food Production, Processing and Nutrition 3 (1): 1. https://doi.org/10.1186/s43014-020-00046-6

Computational and Structural Biology

6 - BioComputing UP

Principal Investigator	Prof. Silvio Tosatto ORCID https://orcid.org/0000-0003-4525-7793 Scopus 9242408800 WoS ID B-2840-2009 Google Scholar Silvio Tosatto
Contact	silvio.tosatto@unipd.it 049 827 6269 website
Keywords	Bioinformatics and Computational Biology; Modeling; Simulation; RNA; Bioinformatics; Statistics; Proteins; Protein Structure; Molecular Dynamics Simulation; Protein-Protein Interaction
Members	Tosatto Silvio — Full Professor Piovesan Damiano — Assistant Professor (RTDb) Minervini Giovanni — Assistant Professor (RTDb) Ivan Micetic — Research Assistant Carraro Marco — Postdoc/Lab manager Aspromonte Maria Cristina — Postdoc Falconieri Antonella — Postdoc Monzon Alex — Postdoc Paladin Lisanna — Postdoc Salladini Edoardo — Postdoc Battistella Diana — Lab manager Quaglia Federica — CNR postdoc Balatti Galo — MSCA RISE Research Fellow Victoria Nugnes — MSCA RISE Research Fellow Julián Axel Bergier — MSCA RISE Research Fellow Hatos Andras — Research fellow Gregoris Francesco — Research fellow Tenorio Ku Luiggi Gianpiere — Research fellow Bevilacqua Martina — PhD Student Camagni Giorgia Francesca — PhD Student Clementel Damiano — PhD Student Del Conte Alessio — PhD Student Pradelli Franco — PhD Student
Research projects	- *IDPfun - Driving the functional characterization of intrinsically disordered proteins* (MSCA RISE) - *REFRACT - Repeat protein Function Refinement, Annotation and Classification of Topologies* (MSCA RISE) - *Towards a mechanistic understanding of von Hippel-Lindau syndrome in*

	different tissues (AIRC) - *Protein bioinformatics for human health* (PRIN) - *CONVERGE - Connect and align ELIXIR Nodes to deliver sustainable FAIR life-science data management services* (RIA INFRADEV) - *PhasAGE - Excellence Hub on Phase Transitions in Aging and Age-Related Disorders* (CSA WIDESPREAD) - *Bioschemas* (ELIXIR Europe) - *Platforms* (ELIXIR Europe) - TRELIS - *Tandem REpeats in Large proteIn platformS* (MSCA SoE - Paladin) - *Targeting the interaction of poly-Q expanded AR receptor with pVHL to ameliorate SBMA* (Kennedy's Foundation - Falconeri) - *Implementation Study: Standardizing Intrinsically Disordered Proteins (IDPs) data* (ELIXIR Europe) - *Improving IDP tools interoperability and integration into ELIXIR* (ELIXIR Europe)
University and Business collaborations	- *ELIXIR commissioned services contract for projects under the platform funding document nr. 15 IT-2019* - *Commercial Licence Agreement Sanofi-aventis recherche & développement*
Publications	A, Peronato, Minervini G, Tabarelli M, Ballarin L, and Franchi N. 2021. 'Characterisation and Functional Role of a Novel C1qDC Protein from a Colonial Ascidian'. Developmental & Comparative Immunology 122 (September): 104077. https://doi.org/10.1016/j.dci.2021.104077 Balatti, Galo. E., G. Patricio Barletta, Gustavo Parisi, Silvio. C. E. Tosatto, Massimo Bellanda, and Sebastian Fernandez-Alberti. 2021. 'Intrinsically Disordered Region Modulates Ligand Binding in Glutaredoxin 1 from Trypanosoma Brucei'. The Journal of Physical Chemistry B 125 (49): 13366–75. https://doi.org/10.1021/acs.jpcb.1c07035 Bevilacqua, Martina, Lisanna Paladin, Silvio C E Tosatto, and Damiano Piovesan. 2022. 'ProSeqViewer: An Interactive, Responsive and Efficient TypeScript Library for Visualization of Sequences and Alignments in Web Applications'. Edited by Jinbo Xu. Bioinformatics 38 (4): 1129–30. https://doi.org/10.1093/bioinformatics/btab764 Blum, Matthias, Hsin-Yu Chang, Sara Chuguransky, Tiago Grego, Swaathi Kandasaamy, Alex Mitchell, Gift Nuka, et al. 2021. 'The InterPro Protein Families and Domains Database: 20 Years On'. Nucleic Acids Research 49 (D1): D344–54. https://doi.org/10.1093/nar/gkaa977 CAID Predictors, DisProt Curators, Marco Necci, Damiano Piovesan, and Silvio C. E. Tosatto. 2021. 'Critical Assessment of Protein Intrinsic Disorder Prediction'. Nature Methods 18 (5): 472–81. https://doi.org/10.1038/s41592-021-01117-3 Csizmadia, Georgina, Gábor Erdős, Hedvig Tordai, Rita Padányi, Silvio Tosatto, Zsuzsanna Dosztányi, and Tamás Hegedűs. 2021. 'The MemMoRF Database for Recognizing Disordered Protein Regions Interacting with Cellular Membranes'.

Nucleic Acids Research 49 (D1): D355–60. https://doi.org/10.1093/nar/gkaa954

Dassie, Francesca, Riccardina Lorusso, Silvia Benavides‐Varela, Gabriella Milan, Francesca Favaretto, Edward Callus, Stefano Cagnin, et al. 2021. 'Neurocognitive Assessment and DNA Sequencing Expand the Phenotype and Genotype Spectrum of Alström Syndrome'. American Journal of Medical Genetics Part A 185 (3): 732–42. https://doi.org/10.1002/ajmg.a.62029

Galber, Chiara, Giovanni Minervini, Giuseppe Cannino, Francesco Boldrin, Valeria Petronilli, Silvio Tosatto, Giovanna Lippe, and Valentina Giorgio. 2021. 'The f Subunit of Human ATP Synthase Is Essential for Normal Mitochondrial Morphology and Permeability Transition'. Cell Reports 35 (6): 109111. https://doi.org/10.1016/j.celrep.2021.109111

Hatos, Andras, Alexander Miguel Monzon, Silvio C E Tosatto, Damiano Piovesan, and Monika Fuxreiter. 2022. 'FuzDB: A New Phase in Understanding Fuzzy Interactions'. Nucleic Acids Research 50 (D1): D509–17. https://doi.org/10.1093/nar/gkab1060

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Mistry, Jaina, Sara Chuguransky, Lowri Williams, Matloob Qureshi, Gustavo A Salazar, Erik L L Sonnhammer, Silvio C E Tosatto, et al. 2021. 'Pfam: The Protein Families Database in 2021'. Nucleic Acids Research 49 (D1): D412–19. https://doi.org/10.1093/nar/gkaa913

Monzon, Alexander Miguel, Paolo Bonato, Marco Necci, Silvio C.E. Tosatto, and Damiano Piovesan. 2021. 'FLIPPER: Predicting and Characterizing Linear Interacting Peptides in the Protein Data Bank'. Journal of Molecular Biology 433 (9): 166900. https://doi.org/10.1016/j.jmb.2021.166900

Paladin, Lisanna, Martina Bevilacqua, Sara Errigo, Damiano Piovesan, Ivan Mičetić, Marco Necci, Alexander Miguel Monzon, et al. 2021. 'RepeatsDB in 2021: Improved Data and Extended Classification for Protein Tandem Repeat Structures'. Nucleic Acids Research 49 (D1): D452–57. https://doi.org/10.1093/nar/gkaa1097

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Quaglia, Federica, Tamas Lazar, András Hatos, Peter Tompa, Damiano Piovesan, and Silvio C. E. Tosatto. 2021. 'Exploring Curated Conformational Ensembles of Intrinsically Disordered Proteins in the Protein Ensemble Database'. Current Protocols 1 (7). https://doi.org/10.1002/cpz1.192

Rocca, Maria Santa, Giovanni Minervini, Andrea Di Nisio, Maurizio Merico, Maria Bueno Marinas, Luca De Toni, Kalliopi Pilichou, Andrea Garolla, Carlo Foresta, and Alberto Ferlin. 2021. 'Identification of Rare LRP5 Variants in a Cohort of Males with Impaired Bone Mass'. International Journal of Molecular Sciences 22 (19): 10834. https://doi.org/10.3390/ijms221910834

Walsh, Ian, Dmytro Fishman, Dario Garcia-Gasulla, Tiina Titma, Gianluca Pollastri, ELIXIR Machine Learning Focus Group, Emidio Capriotti, et al. 2021. 'DOME: Recommendations for Supervised Machine Learning Validation in Biology'. Nature Methods 18 (10): 1122–27. https://doi.org/10.1038/s41592-021-01205-4

7 - Protein crystallography and cryoEM

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Research projects	- *Discovering how signalling pathways coordinate intracellular organelle communication* (PRIN - Calì) - *Peeping at sympathetic innervation of normal and diseased skeletal muscles through optogenetics - SKoOP* (STARS-CoG - Zanotti/Zaglia) - *MOVESIN - Dynamic synaptic junctions at the interface between organelles orchestrate intracellular communication in physiopathology* (STARS-CoG - Calì)
Publications	Antón, Zuriñe, Johannes F. Weijman, Christopher Williams, Edmund R. R. Moody, Judith Mantell, Yan Y. Yip, Jessica A. Cross, et al. 2021. 'Molecular Mechanism for Kinesin-1 Direct Membrane Recognition'. Science Advances 7 (31): eabg6636. https://doi.org/10.1126/sciadv.abg6636 Barazzuol, Lucia, Flavia Giamogante, and Tito Calì. 2021. 'Mitochondria Associated Membranes (MAMs): Architecture and Physiopathological Role'. Cell Calcium 94 (March): 102343. https://doi.org/10.1016/j.ceca.2020.102343 Calì, Tito, and Marisa Brini. 2021. 'Quantification of Organelle Contact Sites by Split-GFP-Based Contact Site Sensors (SPLICS) in Living Cells'. Nature Protocols 16 (11): 5287–5308. https://doi.org/10.1038/s41596-021-00614-1 Cross, Jessica A., Magda S. Chegkazi, Roberto A. Steiner, Derek N. Woolfson, and Mark P. Dodding. 2021. 'Fragment-Linking Peptide Design Yields a High-Affinity Ligand for Microtubule-Based Transport'. Cell Chemical Biology 28 (9): 1347-1355.e5. https://doi.org/10.1016/j.chembiol.2021.03.010 Giamogante, Flavia, Tito Calì, and Francesco Malatesta. 2021. 'Physiological Cyanide Concentrations Do Not Stimulate Mitochondrial Cytochrome c Oxidase Activity'.

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Giamogante, Flavia, Elena Poggio, Lucia Barazzuol, Alberto Covallero, and Tito Calì. 2021. 'Apoptotic Signals at the Endoplasmic Reticulum-Mitochondria Interface'. In Advances in Protein Chemistry and Structural Biology, 126:307–43. Elsevier. https://doi.org/10.1016/bs.apcsb.2021.02.007

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Lim, Dmitry, Giulia Dematteis, Laura Tapella, Armando A. Genazzani, Tito Calì, Marisa Brini, and Alexei Verkhratsky. 2021. 'Ca2+ Handling at the Mitochondria-ER Contact Sites in Neurodegeneration'. Cell Calcium 98 (September): 102453. https://doi.org/10.1016/j.ceca.2021.102453

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Peggion, Caterina, Maria Lina Massimino, Raphael Severino Bonadio, Federica Lia, Raffaele Lopreiato, Stefano Cagnin, Tito Calì, and Alessandro Bertoli. 2021. 'Regulation of Endoplasmic Reticulum–Mitochondria Tethering and Ca2+ Fluxes by TDP-43 via GSK3β'. International Journal of Molecular Sciences 22 (21): 11853. https://doi.org/10.3390/ijms222111853

Rossi, Alice, Luisa Galla, Chiara Gomiero, Lorena Zentilin, Mauro Giacca, Valentina Giorgio, Tito Calì, Tullio Pozzan, Elisa Greotti, and Paola Pizzo. 2021. 'Calcium Signaling and Mitochondrial Function in Presenilin 2 Knock-Out Mice: Looking for Any Loss-of-Function Phenotype Related to Alzheimer's Disease'. Cells 10 (2): 204. https://doi.org/10.3390/cells10020204

8 - Protein interactions and dynamics

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Research projects	- *Aberrant condensates as drug-targets for cancer* (AIRC)
Publications	Freiberger, Maria I., Peter G. Wolynes, Diego U. Ferreiro, and Monika Fuxreiter. 2021. 'Frustration in Fuzzy Protein Complexes Leads to Interaction Versatility'. The Journal of Physical Chemistry B 125 (10): 2513–20. https://doi.org/10.1021/acs.jpcb.0c11068 Fuxreiter, Monika. 2021. 'Spot in a Drop: Mutations in Aberrant Condensates'. Nature Reviews Molecular Cell Biology 22 (3): 162–63. https://doi.org/10.1038/s41580-021-00338-w Fuxreiter, Monika. 2022. 'Protein Interactions in Liquid–Liquid Phase Separation'. Journal of Molecular Biology 434 (1): 167388. https://doi.org/10.1016/j.jmb.2021.167388 Fuxreiter, Monika, and Michele Vendruscolo. 2021. 'Generic Nature of the Condensed States of Proteins'. Nature Cell Biology 23 (6): 587–94. https://doi.org/10.1038/s41556-021-00697-8 Gianni, Stefano, María Inés Freiberger, Per Jemth, Diego U. Ferreiro, Peter G. Wolynes, and Monika Fuxreiter. 2021. 'Fuzziness and Frustration in the Energy Landscape of Protein Folding, Function, and Assembly'. Accounts of Chemical Research 54 (5): 1251–59. https://doi.org/10.1021/acs.accounts.0c00813 Hardenberg, Maarten C, Tessa Sinnige, Sam Casford, Samuel Dada, Chetan Poudel, Elizabeth A Robinson, Monika Fuxreiter, et al. 2021. 'Observation of an α-Synuclein Liquid Droplet State and Its Maturation into Lewy Body-like Assemblies'. Journal of Molecular Cell Biology, January, mjaa075. https://doi.org/10.1093/jmcb/mjaa075 Hatos, Andras, Alexander Miguel Monzon, Silvio C E Tosatto, Damiano Piovesan, and Monika Fuxreiter. 2022. 'FuzDB: A New Phase in Understanding Fuzzy Interactions'. Nucleic Acids Research 50 (D1): D509–17. https://doi.org/10.1093/nar/gkab1060 Piovesan, Damiano, Marco Necci, Nahuel Escobedo, Alexander Miguel Monzon, András Hatos, Ivan Mičetić, Federica Quaglia, et al. 2021. 'MobiDB: Intrinsically Disordered Proteins in 2021'. Nucleic Acids Research 49 (D1): D361–67.

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Inflammation and Immunity

9 - Inflammation and immunity

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Research projects	- *MOBILISE - Monoamine oxidase B inhibitors as novel drugs targeting NLRP3 inflammasome* (ERC PoC) - *Characterization of the mechanism of hyper production of proinflammatory* (CARIPARO - Martinvalet) - *COVIDIamo: tracing the dynamics of COVID19 at single-cell multi-omic resolution for drug repurposing and biomarker identification* (Fondazione Human Technopole)
Publications	Angioni, Roberta, Ricardo Sánchez-Rodríguez, Antonella Viola, and Barbara Molon. 2021. 'TGF-β in Cancer: Metabolic Driver of the Tolerogenic Crosstalk in the Tumor Microenvironment'. Cancers 13 (3): 401. https://doi.org/10.3390/cancers13030401 Calì, Bianca, Andrielly H. R. Agnellini, Chiara Cioccarelli, Ricardo Sanchez-Rodriguez, Andrea Predonzani, Giulia Ilaria Toffolo, Antonella Viola, et al. 2021. 'GM-CSF Nitration Is a New Driver of Myeloid Suppressor Cell Activity in Tumors'. Frontiers in Immunology 12 (October): 718098. https://doi.org/10.3389/fimmu.2021.718098 Canton, Marcella, Ricardo Sánchez-Rodríguez, Iolanda Spera, Francisca C. Venegas,

Maria Favia, Antonella Viola, and Alessandra Castegna. 2021. 'Reactive Oxygen Species in Macrophages: Sources and Targets'. Frontiers in Immunology 12 (September): 734229. https://doi.org/10.3389/fimmu.2021.734229

Cioccarelli, Chiara, Ricardo Sánchez-Rodríguez, Roberta Angioni, Francisca C. Venegas, Nicole Bertoldi, Fabio Munari, Annamaria Cattelan, Barbara Molon, and Antonella Viola. 2021. 'IL1β Promotes TMPRSS2 Expression and SARS-CoV-2 Cell Entry Through the P38 MAPK-GATA2 Axis'. Frontiers in Immunology 12 (December): 781352. https://doi.org/10.3389/fimmu.2021.781352

Feno, Simona, Fabio Munari, Denis Vecellio Reane, Rosanna Gissi, Dieu-Huong Hoang, Alessandra Castegna, Bénédicte Chazaud, Antonella Viola, Rosario Rizzuto, and Anna Raffaello. 2021. 'The Dominant-Negative Mitochondrial Calcium Uniporter Subunit MCUb Drives Macrophage Polarization during Skeletal Muscle Regeneration'. Science Signaling 14 (707): eabf3838. https://doi.org/10.1126/scisignal.abf3838

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Spera, Iolanda, Ricardo Sánchez-Rodríguez, Maria Favia, Alessio Menga, Francisca C. Venegas, Roberta Angioni, Fabio Munari, et al. 2021. 'The J2-Immortalized Murine Macrophage Cell Line Displays Phenotypical and Metabolic Features of Primary BMDMs in Their M1 and M2 Polarization State'. Cancers 13 (21): 5478. https://doi.org/10.3390/cancers13215478

Tolomeo, Anna Maria, Ignazio Castagliuolo, Martina Piccoli, Michele Grassi, Fabio Magarotto, Giada De Lazzari, Ricardo Malvicini, et al. 2021. 'Extracellular Vesicles Secreted by Mesenchymal Stromal Cells Exert Opposite Effects to Their Cells of Origin in Murine Sodium Dextran Sulfate-Induced Colitis'. Frontiers in Immunology 12 (April): 627605. https://doi.org/10.3389/fimmu.2021.627605

Medical Biotechnology

10 - Extracellular Matrix (Ecm) Pathobiology

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Publications	Karamanos, Nikos K., Achilleas D. Theocharis, Zoi Piperigkou, Dimitra Manou, Alberto Passi, Spyros S. Skandalis, Demitrios H. Vynios, et al. 2021. 'A Guide to the Composition and Functions of the Extracellular Matrix'. The FEBS Journal 288 (24): 6850–6912. https://doi.org/10.1111/febs.15776 Masola, Valentina, Mario Bonomini, Maurizio Onisto, Pietro Manuel Ferraro, Arduino Arduini, and Giovanni Gambaro. 2021. 'Biological Effects of XyloCore, a Glucose Sparing PD Solution, on Mesothelial Cells: Focus on Mesothelial-Mesenchymal Transition, Inflammation and Angiogenesis'. Nutrients 13 (7): 2282. https://doi.org/10.3390/nu13072282 Masola, Valentina, Gianluigi Zaza, Arduino Arduini, Maurizio Onisto, and Giovanni Gambaro. 2021. 'Endothelial Glycocalyx as a Regulator of Fibrotic Processes'. International Journal of Molecular Sciences 22 (6): 2996. https://doi.org/10.3390/ijms22062996 Matsuura, Shinobu, Alessandra Balduini, and Maurizio Onisto. 2021. 'Editorial: Mechanisms of Cell Adhesion in Hematopoietic Stem Cells'. Frontiers in Cell and Developmental Biology 9 (December): 826554. https://doi.org/10.3389/fcell.2021.826554 Sacco, Emilio, Matteo Vittori, Pietro Manuel Ferraro, Paola Verde, Alessandro Scagliusi, Silvia Baroni, Valentina Masola, Maurizio Onisto, Maria Nicosia, and PierFrancesco Bassi. 2022. 'Renal Effect of Severe Hypoxia Evaluated By NGAL Measurements: An in Vivo and in Vitro Study'. Urologia Journal 89 (1): 38–43. https://doi.org/10.1177/03915603211009117

11 - Immune nano-technology

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Research projects	- *Wound Healing In Space: Key challenges towards Intelligent and Enabling Sensing platforms (WHISKIES)* (ESA) - *SEE: mapping the skin-immune interactions of novel 2D materials MXENES* (MSCA IF - Fusco)
Publications	Fusco, Laura, Marco Orecchioni, Giacomo Reina, Valentina Bordoni, Claudia Fuoco, Cansu Gurcan, Shi Guo, et al. 2021. 'Lateral Dimension and Amino-Functionalization on the Balance to Assess the Single-Cell Toxicity of Graphene on Fifteen Immune Cell Types'. NanoImpact 23 (July): 100330. https://doi.org/10.1016/j.impact.2021.100330 Memarian, Parastoo, Francesco Sartor, Enrico Bernardo, Hamada Elsayed, Batur Ercan, Lucia Gemma Delogu, Barbara Zavan, and Maurizio Isola. 2021. 'Osteogenic Properties of 3D-Printed Silica-Carbon-Calcite Composite Scaffolds: Novel Approach for Personalized Bone Tissue Regeneration'. International Journal of Molecular Sciences 22 (2): 475. https://doi.org/10.3390/ijms22020475 Unal, Mehmet Altay, Fatma Bayrakdar, Laura Fusco, Omur Besbinar, Christopher E. Shuck, Süleyman Yalcin, Mine Turktas Erken, et al. 2021. '2D MXenes with Antiviral and Immunomodulatory Properties: A Pilot Study against SARS-CoV-2'. Nano Today 38 (June): 101136. https://doi.org/10.1016/j.nantod.2021.101136 Unal, Mehmet Altay, Fatma Bayrakdar, Hasan Nazir, Omur Besbinar, Cansu Gurcan, Neus Lozano, Luis M. Arellano, et al. 2021. 'Graphene Oxide Nanosheets Interact and Interfere with SARS‐CoV‐2 Surface Proteins and Cell Receptors to Inhibit Infectivity'. Small 17 (25): 2101483. https://doi.org/10.1002/smll.202101483 Yan, J. Stephen, Marco Orecchioni, Flavia Vitale, Julia A. Coco, Guillaume Duret, Salvatore Antonucci, Sushma Sri Pamulapati, et al. 2021. 'Biocompatibility Studies of Macroscopic Fibers Made from Carbon Nanotubes: Implications for Carbon Nanotube Macrostructures in Biomedical Applications'. Carbon 173 (March): 462–76. https://doi.org/10.1016/j.carbon.2020.10.077

12 - Mass Spectrometry and Proteomics

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Publications	Battisti, Ilaria, Leonard Barnabas Ebinezer, Giovanna Lomolino, Antonio Masi, and Giorgio Arrigoni. 2021. 'Protein Profile of Commercial Soybean Milks Analyzed by Label-Free Quantitative Proteomics'. Food Chemistry 352 (August): 129299. https://doi.org/10.1016/j.foodchem.2021.129299 Calì, Bianca, Andrielly H. R. Agnellini, Chiara Cioccarelli, Ricardo Sanchez-Rodriguez, Andrea Predonzani, Giulia Ilaria Toffolo, Antonella Viola, et al. 2021. 'GM-CSF Nitration Is a New Driver of Myeloid Suppressor Cell Activity in Tumors'. Frontiers in Immunology 12 (October): 718098. https://doi.org/10.3389/fimmu.2021.718098 Streubel-Gallasch, Linn, Veronica Giusti, Michele Sandre, Isabella Tessari, Nicoletta Plotegher, Elena Giusto, Anna Masato, et al. 2021. 'Parkinson's Disease–Associated LRRK2 Interferes with Astrocyte-Mediated Alpha-Synuclein Clearance'. Molecular Neurobiology 58 (7): 3119–40. https://doi.org/10.1007/s12035-021-02327-8 Tolomeo, Anna Maria, Santina Quarta, Alessandra Biasiolo, Mariagrazia Ruvoletto, Michela Pozzobon, Giada De Lazzari, Ricardo Malvicini, et al. 2021. 'Engineered EVs for Oxidative Stress Protection'. Pharmaceuticals 14 (8): 703. https://doi.org/10.3390/ph14080703 Tosello, Valeria, Deborah Bongiovanni, Ludovica Di Martino, Cinzia Franchin, Paola Zanovello, Giorgio Arrigoni, and Erich Piovan. 2021. 'Responsiveness to Hedgehog Pathway Inhibitors in T-Cell Acute Lymphoblastic Leukemia Cells Is Highly Dependent on 5′AMP-Activated Kinase Inactivation'. International Journal of Molecular Sciences 22 (12): 6384. https://doi.org/10.3390/ijms22126384 Ura, Blendi, Lorenzo Monasta, Yeraldin De Spelorzi, Giorgio Arrigoni, Cinzia Franchin, Stefania Biffi, Michelangelo Aloisio, et al. 2020. 'Proteins Involved in Oxidative Stress in Leiomyoma Tissues Treated with Ulipristal Acetate'. Molecular Medicine Reports 23 (1): 1–1. https://doi.org/10.3892/mmr.2020.11642

13 - Nano-biotechnology and nano-biomedicine

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Research projects	- *DIRNANO - Directing the immune response through designed nanomaterials* (MSCA ITN)
Publications	Trzciński, Jakub W., Lucía Morillas-Becerril, Sara Scarpa, Marco Tannorella, Francesco Muraca, Federico Rastrelli, Chiara Castellani, et al. 2021. 'Poly(Lipoic Acid)-Based Nanoparticles as Self-Organized, Biocompatible, and Corona-Free Nanovectors'. Biomacromolecules 22 (2): 467–80. https://doi.org/10.1021/acs.biomac.0c01321

14 - Peptides and Antibodies

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15 - Protein engineering

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Publications	Emanuela Jacchetti , Ramin Nasehi , Lucia Boeri, Valentina Parodi , Alessandro Negro , Diego Albani , Roberto Osellame , Giulio Cerullo, Jose Felix Rodriguez Matas , Manuela Teresa Raimondi. 2021 The nuclear import of the transcription factor MyoD is reduced in mesenchymal stem cells grown in a 3D micro-engineered niche. Sci. Rep.11(1):3021. https://doi.org/10.1038/s41598-021-81920-2

Mitochondrial Pathophysiology

16 - Mitochondria in Cell Death and Cancer

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Keywords	Apoptosis; Cell Culture; Oxidative Stress; Cancer Research; Cancer Cells; Pharmacology; Cell Biology; Developmental Biology; Tumor Metabolism; Cancer Biology; Chaperone; Mitochondria; Signal Transduction	
Members	Bernardi Paolo — Full Professor Rasola Andrea — Associate Professor Masgras Ionica — CNR researcher Petronilli Valeria — CNR researcher Trevisan Elena — Research Assistant Cannino Giuseppe — Postdoc Carraro Michela — Postdoc Carrer Andrea — Postdoc Dalzini Annalisa — Postdoc Favia Maria — Postdoc Ferrone Lavinia — Postdoc La Spina Martina — Postdoc Laquatra Claudio — Postdoc Sanchez Martin Carlos — Postdoc Smolina Natalia — Postdoc Boscolo Nata Federica — Research fellow Ciscato Francesco — Research fellow Urbani Andrea — Research fellow Voltolin Caterina — Research fellow Frigo Elena — PhD Student Scantamburlo Francesca — PhD Student Tommasin Ludovica — PhD Student	
Research projects	- *The dual function of F-ATP synthase in tumor cell metabolism and survival* (AIRC - Bernardi) - *A TRAP on the road to tumor growth: targeting the pro-neoplastic functions of the mitochondrial chaperone TRAP1* (AIRC - Rasola)	

	- *Targeting the interaction between SARS-CoV-2 and host cells as a potential anti-viral strategy* (CARIPARO - Rasola) - *Hexokinase 2 displacement from mitochondria-associated membranes* (Children Tumor Foundation - Rasola/Ciscato) - TRAPping neurofibromas. Inibition of the mitochondrial chaperone TRAP1 (Children Tumor Foundation - Rasola) - *Targeting Mitochondria to Treat Heart Disease* (Fondazione Leducq - Bernardi) - *Channel formation by mitochondrial ATP synthase: Mechanisms and regulation* (PRIN - Bernardi) - *Breath-Hold Diving: Mechanisms of Hypoxemia and Decompression Stress* (Office of Naval Research - Bosco) - *Underwater and Extreme Environment Human Performance* (DAN Europe Foundation - Bosco) - *TRACER Bloccare l'ingresso del virus SARS-CoV-2 nelle le cellule ospiti come potenziale strategia antivirale* (FISR - Rasola) - *TRAPping tumor growth: designing molecules to perturb the chaperone TRAP1, from enzymatic activities to cell-cell interactions (TRAP)* (PRIN - Rasola)
Publications	Abbonante, Vittorio, Cristian Gruppi, Monica Battiston, Alessandra Zulian, Christian Andrea Di Buduo, Martina Chrisam, Lucia Sereni, et al. 2021. 'Ablation of Collagen VI Leads to the Release of Platelets with Altered Function'. Blood Advances 5 (23): 5150–63. https://doi.org/10.1182/bloodadvances.2020002671 Bernardi, Paolo. 2021. 'Looking Back to the Future of Mitochondrial Research'. Frontiers in Physiology 12 (April): 682467. https://doi.org/10.3389/fphys.2021.682467 Bernardi, Paolo, Michela Carraro, and Giovanna Lippe. 2021. 'The Mitochondrial Permeability Transition: Recent Progress and Open Questions'. The FEBS Journal, November, febs.16254. https://doi.org/10.1111/febs.16254 Carrer, Andrea, Ludovica Tommasin, Justina Šileikytė, Francesco Ciscato, Riccardo Filadi, Andrea Urbani, Michael Forte, et al. 2021. 'Defining the Molecular Mechanisms of the Mitochondrial Permeability Transition through Genetic Manipulation of F-ATP Synthase'. Nature Communications 12 (1): 4835. https://doi.org/10.1038/s41467-021-25161-x Ciscato, Francesco, Federica Chiara, Riccardo Filadi, and Andrea Rasola. 2021. 'Analysis of the Effects of Hexokinase 2 Detachment From Mitochondria-Associated Membranes with the Highly Selective Peptide HK2pep'. BIO-PROTOCOL 11 (14). https://doi.org/10.21769/BioProtoc.4087 Ciscato, Francesco, Lavinia Ferrone, Ionica Masgras, Claudio Laquatra, and Andrea Rasola. 2021. 'Hexokinase 2 in Cancer: A Prima Donna Playing Multiple Characters'. International Journal of Molecular Sciences 22 (9): 4716. https://doi.org/10.3390/ijms22094716 Errico, Andrea, Anna Stocco, Vincent M. Riccardi, Alberto Gambalunga, Franco Bassetto, Martina Grigatti, Amedeo Ferlosio, et al. 2021. 'Neurofibromin

Deficiency and Extracellular Matrix Cooperate to Increase Transforming Potential through FAK-Dependent Signaling'. Cancers 13 (10): 2329. https://doi.org/10.3390/cancers13102329

Facchinello, Nicola, Claudio Laquatra, Lisa Locatello, Giorgia Beffagna, Raquel Brañas Casas, Chiara Fornetto, Alberto Dinarello, et al. 2021. 'Efficient Clofilium Tosylate-Mediated Rescue of POLG-Related Disease Phenotypes in Zebrafish'. Cell Death & Disease 12 (1): 100. https://doi.org/10.1038/s41419-020-03359-z

Fasolato, Silvano, Mariagrazia Ruvoletto, Giorgia Nardo, Andrea Rasola, Marco Sciacovelli, Giacomo Zanus, Cristian Turato, et al. 2021. 'Low P66shc with High SerpinB3 Levels Favors Necroptosis and Better Survival in Hepatocellular Carcinoma'. Biology 10 (5): 363. https://doi.org/10.3390/biology10050363

Ferraro, Mariarosaria, Elisabetta Moroni, Emiliano Ippoliti, Silvia Rinaldi, Carlos Sanchez-Martin, Andrea Rasola, Luca F. Pavarino, and Giorgio Colombo. 2021. 'Machine Learning of Allosteric Effects: The Analysis of Ligand-Induced Dynamics to Predict Functional Effects in TRAP1'. The Journal of Physical Chemistry B 125 (1): 101–14. https://doi.org/10.1021/acs.jpcb.0c09742

Laquatra, Claudio, Carlos Sanchez-Martin, Alberto Dinarello, Giuseppe Cannino, Giovanni Minervini, Elisabetta Moroni, Marco Schiavone, et al. 2021. 'HIF1α-Dependent Induction of the Mitochondrial Chaperone TRAP1 Regulates Bioenergetic Adaptations to Hypoxia'. Cell Death & Disease 12 (5): 434. https://doi.org/10.1038/s41419-021-03716-6

Masgras, Ionica, Claudio Laquatra, Giuseppe Cannino, Stefano A. Serapian, Giorgio Colombo, and Andrea Rasola. 2021. 'The Molecular Chaperone TRAP1 in Cancer: From the Basics of Biology to Pharmacological Targeting'. Seminars in Cancer Biology 76 (November): 45–53. https://doi.org/10.1016/j.semcancer.2021.07.002

Serapian, Stefano A., Carlos Sanchez-Martín, Elisabetta Moroni, Andrea Rasola, and Giorgio Colombo. 2021. 'Targeting the Mitochondrial Chaperone TRAP1: Strategies and Therapeutic Perspectives'. Trends in Pharmacological Sciences 42 (7): 566–76. https://doi.org/10.1016/j.tips.2021.04.003

Stocco, Anna, Natalia Smolina, Patrizia Sabatelli, Justina Šileikytė, Edoardo Artusi, Vincent Mouly, Michael Cohen, Michael Forte, Marco Schiavone, and Paolo Bernardi. 2021. 'Treatment with a Triazole Inhibitor of the Mitochondrial Permeability Transition Pore Fully Corrects the Pathology of Sapje Zebrafish Lacking Dystrophin'. Pharmacological Research 165 (March): 105421. https://doi.org/10.1016/j.phrs.2021.105421

Triveri, Alice, Stefano A. Serapian, Filippo Marchetti, Filippo Doria, Silvia Pavoni, Fabrizio Cinquini, Elisabetta Moroni, Andrea Rasola, Francesco Frigerio, and Giorgio Colombo. 2021. 'SARS-CoV-2 Spike Protein Mutations and Escape from Antibodies: A Computational Model of Epitope Loss in Variants of Concern'. Journal of Chemical Information and Modeling 61 (9): 4687–4700. https://doi.org/10.1021/acs.jcim.1c00857

Zonta, Francesca, Christian Borgo, Camila Paz Quezada Meza, Ionica Masgras, Andrea Rasola, Mauro Salvi, Lorenzo A. Pinna, and Maria Ruzzene. 2021. 'Contribution of the CK2 Catalytic Isoforms α and α' to the Glycolytic Phenotype

	of Tumor Cells'. Cells 10 (1): 181. https://doi.org/10.3390/cells10010181

17 - Mitochondrial Calcium Signaling

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Keywords	
Members	Rizzuto Rosario — Full Professor De Stefani Diego — Associate Professor Mammucari Cristina — Associate Professor Raffaello Anna — Associate Professor Pallafacchina Giorgia — CNR researcher Ausoni Simonetta — Researcher Menegazzi Valentina — Research Assistant De Mario Agnese — Postdoc Feno Santina — Postdoc Gherardi Gaia — Postdoc Vecellio Reane Denis — Postdoc Vetralla Massimo — Postdoc Cadenelli Vanessa — Research Fellow D'Angelo Donato — PhD Student Placa Federica — PhD Student
Research projects	- *Metastatic disease: the key unmet need in oncology* (AIRC) - *Sensing Cell Mechanics* (CARIPARO) - *The importance of megakaryocyte endoplasmic reticulum/mitochondria calcium toolkit in the path…* (CARIPLO - De Stefani) - *4D molecular analysis on dynamic subcellular nanostructures by feedback-based imaging and tracking: the biochemistry of nutrient and energy sensing* (PRIN - De Stefani) - *Nutrition, obesity and cancer: pathophysiological aspects* (Ricerca sanitaria finalizzata) - *mitoPOC- Mitochondrial ATP-sensitive potassium channel (mitoKATP): structure, function and pharmacological targeting* (STARS-CoG - De Stefani) - *Biochemical mechanisms and cellular consequences of mitochondrial cation flux: from bioenergetics to metabolic rewiring* (PRIN - De Stefani) - *The structural and functional role of the A-kinase anchoring protein myospryn in striated muscle* (PRIN - Raffaello)
Publications	Butera, Gaia, Denis Vecellio Reane, Marta Canato, Laura Pietrangelo, Simona Boncompagni, Feliciano Protasi, Rosario Rizzuto, Carlo Reggiani, and Anna Raffaello. 2021. 'Parvalbumin Affects Skeletal Muscle Trophism through Modulation

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Mammucari, Cristina. 2021. 'In the Right Place at the Right Time: ROS and Ca2+ Are Allies in the Battle for Survival'. Cell Calcium 95 (May): 102354. https://doi.org/10.1016/j.ceca.2021.102354

Pallafacchina, Giorgia, Sofia Zanin, and Rosario Rizzuto. 2021. 'From the Identification to the Dissection of the Physiological Role of the Mitochondrial Calcium Uniporter: An Ongoing Story'. Biomolecules 11 (6): 786. https://doi.org/10.3390/biom11060786

Serrat, Roman, Ana Covelo, Vladimir Kouskoff, Sebastien Delcasso, Andrea Ruiz-Calvo, Nicolas Chenouard, Carol Stella, et al. 2021. 'Astroglial ER-Mitochondria Calcium Transfer Mediates Endocannabinoid-Dependent Synaptic Integration'. Cell Reports 37 (12): 110133. https://doi.org/10.1016/j.celrep.2021.110133

18 - Mitochondrial medicine

Principal Investigator	Prof. Carlo Fiore Viscomi ORCID https://orcid.org/0000-0001-6050-0566 Scopus 57192336046 WoS ID R-1940-2016
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Keywords	mitochondrial disease, gene therapy, mitochondria, animal models
Members	Viscomi Carlo Fiore — Associate Professor Brischigliaro Michele — Postdoc Giacchin Giacomo — PhD Student
Research projects	- *MTPHAGYTREAT: Study of the role of mitophagy and lysosomal biogenesis in COX deficiency: a new model for drug discovery* (MSCA-IF - Benincà) - *MitMed: identification and characterization of new disease genes for mitochondrial disorders* (Telethon)
Publications	Peruzzo, Roberta, Samantha Corrà, Roberto Costa, Michele Brischigliaro, Tatiana Varanita, Lucia Biasutto, Chiara Rampazzo, et al. 2021. 'Exploiting Pyocyanin to Treat Mitochondrial Disease Due to Respiratory Complex III Dysfunction'. Nature Communications 12 (1): 2103. https://doi.org/10.1038/s41467-021-22062-x Silva-Pinheiro, Pedro, Carlos Pardo-Hernández, Aurelio Reyes, Lisa Tilokani, Anup Mishra, Raffaele Cerutti, Shuaifeng Li, et al. 2021. 'DNA Polymerase Gamma Mutations That Impair Holoenzyme Stability Cause Catalytic Subunit Depletion'. Nucleic Acids Research 49 (9): 5230–48. https://doi.org/10.1093/nar/gkab282 Yin, Zhan, Nils Burger, Duvaraka Kula-Alwar, Dunja Aksentijević, Hannah R. Bridges, Hiran A. Prag, Daniel N. Grba, et al. 2021. 'Structural Basis for a Complex I Mutation That Blocks Pathological ROS Production'. Nature Communications 12 (1): 707. https://doi.org/10.1038/s41467-021-20942-w Zhang, Haixin, Marco Esposito, Mikael G. Pezet, Juvid Aryaman, Wei Wei, Florian Klimm, Claudia Calabrese, et al. 2021. 'Mitochondrial DNA Heteroplasmy Is Modulated during Oocyte Development Propagating Mutation Transmission'. Science Advances 7 (50): eabi5657. https://doi.org/10.1126/sciadv.abi5657

19 - Molecular mechanisms of aging

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Keywords	Aging; Redox Biology; Bioenergetics; Cancer
Members	Giorgio Marco — Associate Professor Casciaro Francesca — Postdoc
Publications	Albiero, Mattia, Marianna D'Anna, Benedetta Maria Bonora, Gaia Zuccolotto, Antonio Rosato, Marco Giorgio, Elisabetta Iori, Angelo Avogaro, and Gian Paolo Fadini. 2022. 'Hematopoietic and Nonhematopoietic P66Shc Differentially Regulates Stem Cell Traffic and Vascular Response to Ischemia in Diabetes'. Antioxidants & Redox Signaling, January, ars.2021.0097. https://doi.org/10.1089/ars.2021.0097 Casciaro, Francesca, Giuseppe Persico, Martina Rusin, Stefano Amatori, Claire Montgomery, Jennifer R. Rutkowsky, Jon J. Ramsey, Gino Cortopassi, Mirco Fanelli and Marco Giorgio. 2021. The Histone H3 K4me3, K27me3, and K27ac Genome-Wide Distributions Are Differently Influenced by Sex in Brain Cortexes and Gastrocnemius of the Alzheimer's Disease PSAPP Mouse Model. Casciaro F, Persico G, Rusin M, Amatori S, Montgomery C, Rutkowsky JR, Ramsey JJ, Cortopassi G, Fanelli M, Giorgio M. Epigenomes. 5:26. https://doi.org/10.3390/epigenomes5040026 Persico, Giuseppe, Francesca Casciaro, Alessandra Marinelli, Chiara Tonelli, Katia Petroni, and Marco Giorgio. 2021. 'Comparative Analysis of Histone H3K4me3 Distribution in Mouse Liver in Different Diets Reveals the Epigenetic Efficacy of Cyanidin-3-O-Glucoside Dietary Intake'. International Journal of Molecular Sciences 22 (12): 6503. https://doi.org/10.3390/ijms22126503

20 - Oxidative metabolism in cardiac disease

Principal Investigator	Prof. Fabio Di Lisa ORCID https://orcid.org/0000-0001-9757-8818 Scopus 26640371000
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Keywords	
Members	Di Lisa Fabio — Full Professor Kaludercic Nina — CNR researcher Menabo` Roberta — CNR Research Assistant Antonucci Salvatore — Postdoc Di Sante Moises — Postdoc Brugnaro Marco — Research fellow Valle Giorgia — Research fellow
Research projects	- *Targeting Mitochondria to Treat Heart Disease* (Fondazione Leducq)
Publications	Andreadou, Ioanna, Andreas Daiber, Gary F. Baxter, Maria Felice Brizzi, Fabio Di Lisa, Nina Kaludercic, Antigone Lazou, et al. 2021. 'Influence of Cardiometabolic Comorbidities on Myocardial Function, Infarction, and Cardioprotection: Role of Cardiac Redox Signaling'. Free Radical Biology and Medicine 166 (April): 33–52. https://doi.org/10.1016/j.freeradbiomed.2021.02.012 Antonucci, Salvatore, Fabio Di Lisa, and Nina Kaludercic. 2021. 'Mitochondrial Reactive Oxygen Species in Physiology and Disease'. Cell Calcium 94 (March): 102344. https://doi.org/10.1016/j.ceca.2020.102344 Bou-Teen, Diana, Nina Kaludercic, David Weissman, Belma Turan, Christoph Maack, Fabio Di Lisa, and Marisol Ruiz-Meana. 2021. 'Mitochondrial ROS and Mitochondria-Targeted Antioxidants in the Aged Heart'. Free Radical Biology and Medicine 167 (May): 109–24. https://doi.org/10.1016/j.freeradbiomed.2021.02.043 Chelko, Stephen P., Gizem Keceli, Andrea Carpi, Nunzianna Doti, Jacopo Agrimi, Angeliki Asimaki, Carlos Bueno Beti, et al. 2021. 'Exercise Triggers CAPN1-Mediated AIF Truncation, Inducing Myocyte Cell Death in Arrhythmogenic Cardiomyopathy'. Science Translational Medicine 13 (581): eabf0891. https://doi.org/10.1126/scitranslmed.abf0891 Kaludercic, Nina, and Fabio Di Lisa. 2022. 'Cyclophilin D and P66Shc Contribute to KCl-Induced Ca2+ Increase in Pulmonary Artery Smooth Muscle Cells: A Potentially Relevant Phenomenon Awaiting a Definite Mechanism'. Cardiovascular Research 118 (1): 16–17. https://doi.org/10.1093/cvr/cvab261 Yan, J. Stephen, Marco Orecchioni, Flavia Vitale, Julia A. Coco, Guillaume Duret, Salvatore Antonucci, Sushma Sri Pamulapati, et al. 2021. 'Biocompatibility Studies of

	Macroscopic Fibers Made from Carbon Nanotubes: Implications for Carbon Nanotube Macrostructures in Biomedical Applications'. Carbon 173 (March): 462–76. https://doi.org/10.1016/j.carbon.2020.10.077

21 - Regulation of the Mitochondrial Proteome

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Keywords	
Members	Gyorgy Szabadkai — Associate Professor Ferreira Henriques Tiago Andre — Postdoc Menegollo Michela — Postdoc Suman Matteo — Postdoc
Research projects	- *Exploiting mitochondrial biogenesis pathways to stratify and target different breast cancer subtypes* (AIRC)
Publications	De Mario, Agnese, Anna Tosatto, Julia Marie Hill, Janos Kriston-Vizi, Robin Ketteler, Denis Vecellio Reane, Gino Cortopassi, Gyorgy Szabadkai, Rosario Rizzuto, and Cristina Mammucari. 2021. 'Identification and Functional Validation of FDA-Approved Positive and Negative Modulators of the Mitochondrial Calcium Uniporter'. Cell Reports 35 (12): 109275. https://doi.org/10.1016/j.celrep.2021.109275

Muscle Physiology in Health and Disease

22 - Autonomic Control of Cardiac Function

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Keywords	Cell Physiology; Signal Transduction; Calcium Signaling; Calcium Imaging; GPCR Signaling; Protein Kinases; Molecular Pharmacology; Optogenetics; Cardiomyocytes; Cardiovascular Physiology
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Publications	Basso, Cristina, Tania Zaglia, and Kalliopi Pilichou. 2021. 'Arrhythmogenic Cardiomyopathy: The Ongoing Search for Mechanism-Driven Therapies Meets Extracellular Vesicles'. European Heart Journal 42 (35): 3572–74. https://doi.org/10.1093/eurheartj/ehab512 Borile, Giulia, Tania Zaglia, Stephan E. Lehnart, and Marco Mongillo. 2021. 'Multiphoton Imaging of Ca2+ Instability in Acute Myocardial Slices from a RyR2R2474S Murine Model of Catecholaminergic Polymorphic Ventricular Tachycardia'. Journal of Clinical Medicine 10 (13): 2821. https://doi.org/10.3390/jcm10132821 Scalco, Arianna, Cristina Liboni, Roberta Angioni, Anna Di Bona, Mattia Albiero, Nicole Bertoldi, Gian Paolo Fadini, et al. 2021. 'Arrhythmogenic Cardiomyopathy Is a Multicellular Disease Affecting Cardiac and Bone Marrow Mesenchymal Stromal Cells'. Journal of Clinical Medicine 10 (9): 1871. https://doi.org/10.3390/jcm10091871 Stadiotti, Ilaria, Anna Di Bona, Chiara Assunta Pilato, Arianna Scalco, Anna Guarino, Barbara Micheli, Michela Casella, et al. 2021. 'Neuropeptide Y Promotes Adipogenesis of Human Cardiac Mesenchymal Stromal Cells in Arrhythmogenic Cardiomyopathy'. International Journal of Cardiology 342 (November): 94–102. https://doi.org/10.1016/j.ijcard.2021.08.015

23 - Chaperones in Muscle Differentiation and Disease

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Keywords	Muscle Proteins; Molecular Chaperones; Muscle Damage
Members	Gorza Luisa — Associate Professor De Antoni Silvia — Postdoc
Publications	Blottner, Dieter, Gabor Trautmann, Sandra Furlan, Guido Gambara, Katharina Block, Martina Gutsmann, Lian-Wen Sun, et al. 2021. 'Reciprocal Homer1a and Homer2 Isoform Expression Is a Key Mechanism for Muscle Soleus Atrophy in Spaceflown Mice'. International Journal of Molecular Sciences 23 (1): 75. https://doi.org/10.3390/ijms23010075 Gorza, Luisa, Elena Germinario, Lucia Tibaudo, Maurizio Vitadello, Chiara Tusa, Irene Guerra, Michela Bondì, et al. 2021. 'Chronic Systemic Curcumin Administration Antagonizes Murine Sarcopenia and Presarcopenia'. International Journal of Molecular Sciences 22 (21): 11789. https://doi.org/10.3390/ijms222111789 Gorza, Luisa, Matteo Sorge, Laura Seclì, Mara Brancaccio (2021). Master Regulators of Muscle Atrophy: Role of Costamere Components. Cells, 10 (1): 61. https://doi.org/10.3390/cells1001006

24 - Muscle Contractility And Plasticity

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Keywords	Exercise Physiology; Exercise Science; Exercise Performance; Biomechanics; Physiology; Resistance Training; Strength & Conditioning; Muscle Physiology; Human Physiology; Physical Fitness
Members	Marco Narici — Full Professor Giuseppe De Vito — Full Professor Blaauw Bert — Associate Professor Marcucci Lorenzo — Assistant Professor Murgia Marta — Researcher (ric. universitario) Toniolo Luana — Researcher (ric. universitario) Franchi Martino — Research Associate (RTDa) Germinario Elena — Research Assistant Baraldo Martina — Postdoc Dumitras Ana Georgia — Postdoc Paganini Matteo — Postdoc Bermudez Mora Paula Andrea — Research fellow Dyne Katharine Mary — Research fellow Monti Elena — Research fellow Nogara Leonardo — Research fellow Sirago Giuseppe — Research fellow Geremia Alessia — PhD Student Sarto Fabio — PhD Student Valli Giacomo — PhD Student
Research projects	- *MARS-PRE: MARcartori biologici e funzionali per la biomedicina aStronautica di PREcisione* (ASI) - *The MDS on LDC: Tissue Sharing Programme* (ASI) - *Neuromuscular ageing: mechanisms and functional implications (NeuAge)* (PRIN) - *Ablation of the maladaptive ER stress response restores diaphragm function and insulin resistance in SEPN1-related myopathies* (Ricerca sanitaria finalizzata - Blaauw) - *Heart Fi-Re - HEART Fine REgulation through mechanosensing in myosin filaments: merging theory and experiments into a multi-scale heart simulator* (MSCA IF - Paolocci/Marcucci)
Publications	Antonio Paoli, A., Laura Mancin, Massimiliano Caprio, Elena Monti, Marco V. Narici, Lorenzo Cenci, Fabio Piccini, Matteo Pincella, Davide Grigoletto, and Giuseppe

Marcolin. 2021. ‘Effects of 30 Days of Ketogenic Diet on Body Composition, Muscle Strength, Muscle Area, Metabolism, and Performance in Semi-Professional Soccer Players’. Journal of the International Society of Sports Nutrition 18 (1): 62. https://doi.org/10.1186/s12970-021-00459-9

Bock, Theresa, Clara Türk, Sriram Aravamudhan, Lena Keufgens, Wilhelm Bloch, Dieu Hien Rozsivalova, Vanina Romanello, et al. 2021. ‘PERM1 Interacts with the MICOS-MIB Complex to Connect the Mitochondria and Sarcolemma via Ankyrin B’. Nature Communications 12 (1): 4900. https://doi.org/10.1038/s41467-021-25185-3

Brook, M.S., Usu Din, J. Tarum, A. Selby, J. Quinlan, J.J. Bass, N. Gharahdaghi, et al. 2021. ‘Omega-3 Supplementation during Unilateral Resistance Exercise Training in Older Women: A within Subject and Double-Blind Placebo-Controlled Trial’. Clinical Nutrition ESPEN 46 (December): 394–404. https://doi.org/10.1016/j.clnesp.2021.09.729

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Costantini, Marco, Stefano Testa, Ersilia Fornetti, Claudia Fuoco, Carles Sanchez Riera, Minghao Nie, Sergio Bernardini, et al. 2021. ‘Biofabricating Murine and Human Myo‐substitutes for Rapid Volumetric Muscle Loss Restoration’. EMBO Molecular Medicine 13 (3). https://doi.org/10.15252/emmm.202012778

Deshmukh, A. S., D. E. Steenberg, M. Hostrup, J. B. Birk, J. K. Larsen, A. Santos, R. Kjøbsted, et al. 2021. ‘Deep Muscle-Proteomic Analysis of Freeze-Dried Human Muscle Biopsies Reveals Fiber Type-Specific Adaptations to Exercise Training’. Nature Communications 12 (1): 304. https://doi.org/10.1038/s41467-020-20556-8

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25 - Pathophysiology of Striated Muscles

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Keywords	Cell Biology; Muscle Contraction; Skeletal Muscle; Muscle; Skeletal Muscle Fibers; Muscular Dystrophy; Rare Diseases; Folding Defective Protein; Small Molecule Therapy; Animal Models; Heart Development;
Members	Volpe Pompeo — Associate Professor Sandonà Dorianna — Associate Professor Campione Marina — CNR researcher Nori Alessandra — Researcher Caccin Paola — Research Assistant Carotti Marcello — Research Assistant Furlan Sandra — CNR Research Assistant Scano Martina — Postdoc Carotti Marcello — Research fellow Dalla Barba Francesco — Research fellow Soardi Michela — Research fellow Tarantini Mario — Research fellow Benetollo Alberto — PhD Student
Research projects	- *Microgravity-induced gene expression in a nerve-muscle coculture model - NEMUCO* (ASI) - *Novel zebrafish models of sarcoglycanopathy. Swimming toward a cure* (MDA - Sandonà) - *CFTR correctors to treat sarcoglycanopathy, a repurposing story* (AFM Telethon Sandonà) - *Repurposing CFTR correctors in Allan Herndon Dudley syndrome* (Telethon Sandonà) - *Recuperare proteine misfolded di malattie rare grazie a molecole note* (POC@UNIPD - Sandonà) - *3D modelling of rare muscular diseases, a powerful platform for basic studies and drug validation* (Telethon - Sandonà)
Publications	Blottner, Dieter, Daniele Capitanio, Gabor Trautmann, Sandra Furlan, Guido Gambara, Manuela Moriggi, Katharina Block, et al. 2021. 'Nitrosative Redox Homeostasis and Antioxidant Response Defense in Disused Vastus Lateralis Muscle in Long-Term Bedrest (Toulouse Cocktail Study)'. Antioxidants 10 (3): 378. https://doi.org/10.3390/antiox10030378

	Blottner, Dieter, Gabor Trautmann, Sandra Furlan, Guido Gambara, Katharina Block, Martina Gutsmann, Lian-Wen Sun, et al. 2021. 'Reciprocal Homer1a and Homer2 Isoform Expression Is a Key Mechanism for Muscle Soleus Atrophy in Spaceflown Mice'. International Journal of Molecular Sciences 23 (1): 75. https://doi.org/10.3390/ijms23010075 Lorenzon, Paola, Sandra Furlan, Barbara Ravara, Alessandra Bosutti, Gabriele Massaria, Annalisa Bernareggi, Marina Sciancalepore, et al. 2021. 'Preliminary Observations on Skeletal Muscle Adaptation and Plasticity in Homer 2-/- Mice'. Metabolites 11 (9): 642. https://doi.org/10.3390/metabo11090642 Lucon-Xiccato, Tyrone, Laura Bella, Elena Mainardi, Mattia Baraldi, Michele Bottarelli, Dorianna Sandonà, and Cristiano Bertolucci. 2021. 'An Automated Low-Cost Swim Tunnel for Measuring Swimming Performance in Fish'. Zebrafish 18 (3): 231–34. https://doi.org/10.1089/zeb.2020.1975 Scano, Martina, Alberto Benetollo, Leonardo Nogara, Michela Bondì, Francesco Dalla Barba, Michela Soardi, Sandra Furlan, et al. 2022. 'CFTR Corrector C17 Is Effective in Muscular Dystrophy, in Vivo Proof of Concept in LGMDR3'. Human Molecular Genetics 31 (4): 499–509. https://doi.org/10.1093/hmg/ddab260

26 - Signaling pathways that control protein homeostasis in muscles

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Keywords	Cognitive Neuroscience; Neuroimaging; Brain Imaging; Psychophysiology; Memory; Learning and Memory
Members	Sandri Marco — Full Professor Romanello Vanina — Assistant Professor Armani Andrea — Postdoc Franco Romero Anais — Postdoc Marchioretti Caterina — Postdoc Sartori Roberta — Postdoc Esposito Martina — Research fellow Faedda Nicolò — Research fellow Ferrarese Giulia — Research fellow Tezze Caterina — Research fellow Pezzini Camilla — PhD Student Scalabrin Marco — PhD Student
Research projects	- *Dissecting the role of an uncharacterized FoxO-dependent gene that controls autophagy and ageing* (AFM Telethon) - *Understanding bmp signalling in cancer cachexia* (AIRC) - *Novel player in the control of Metabolism. Focus on Proteostasis, Mitochondria and Peroxisomes - ProMeMix* (STARS-CoG - Sandri/Romanello) - *Myo_LysoZOOM: An insight into lysosomal signature in muscle wasting* (MSCA-IF - Armani)
Publications	Bock, Theresa, Clara Türk, Sriram Aravamudhan, Lena Keufgens, Wilhelm Bloch, Dieu Hien Rozsivalova, Vanina Romanello, et al. 2021. 'PERM1 Interacts with the MICOS-MIB Complex to Connect the Mitochondria and Sarcolemma via Ankyrin B'. Nature Communications 12 (1): 4900. https://doi.org/10.1038/s41467-021-25185-3 Franco-Romero, Anais, and Marco Sandri. 2021. 'Role of Autophagy in Muscle Disease'. Molecular Aspects of Medicine 82 (December): 101041. https://doi.org/10.1016/j.mam.2021.101041 Klionsky, Daniel J., Amal Kamal Abdel-Aziz, Sara Abdelfatah, Mahmoud Abdellatif, Asghar Abdoli, Steffen Abel, Hagai Abeliovich, et al. 2021. 'Guidelines for the Use and Interpretation of Assays for Monitoring Autophagy (4th Edition) 1'. Autophagy 17 (1): 1–382. https://doi.org/10.1080/15548627.2020.1797280 Monti, Elena, Carlo Reggiani, Martino V. Franchi, Luana Toniolo, Marco Sandri, Andrea Armani, Sandra Zampieri, et al. 2021. 'Neuromuscular Junction Instability and

Altered Intracellular Calcium Handling as Early Determinants of Force Loss during Unloading in Humans'. The Journal of Physiology 599 (12): 3037–61. https://doi.org/10.1113/JP281365

Pelosi, Laura, Maria Grazia Berardinelli, Laura Forcina, Francesca Ascenzi, Emanuele Rizzuto, Marco Sandri, Fabrizio De Benedetti, Bianca Maria Scicchitano, and Antonio Musarò. 2021. 'Sustained Systemic Levels of IL-6 Impinge Early Muscle Growth and Induce Muscle Atrophy and Wasting in Adulthood'. Cells 10 (7): 1816. https://doi.org/10.3390/cells10071816

Peris-Moreno, Dulce, Mélodie Malige, Agnès Claustre, Andrea Armani, Cécile Coudy-Gandilhon, Christiane Deval, Daniel Béchet, et al. 2021. 'UBE2L3, a Partner of MuRF1/TRIM63, Is Involved in the Degradation of Myofibrillar Actin and Myosin'. Cells 10 (8): 1974. https://doi.org/10.3390/cells10081974

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27 - Paolocci's lab

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Keywords	
Members	Paolocci Nazareno Associate Professor
Publications	Chelko, Stephen P., Gizem Keceli, Andrea Carpi, Nunzianna Doti, Jacopo Agrimi, Angeliki Asimaki, Carlos Bueno Beti, et al. 2021. 'Exercise Triggers CAPN1-Mediated AIF Truncation, Inducing Myocyte Cell Death in Arrhythmogenic Cardiomyopathy'. Science Translational Medicine 13 (581): eabf0891. https://doi.org/10.1126/scitranslmed.abf0891.

Neuroscience

28 - Circuit formation and function in the brain

Principal Investigator	Dr. Claudia Lodovichi ORCID https://orcid.org/0000-0002-0490-4846 Scopus 6505957685
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Keywords	cAMP; Olfaction; Olfactory Perception; Signaling Pathways; Electrophysiology; Neurobiology; Calcium Imaging; In Vivo Electrophysiology; Adult Neurogenesis; Neural Plasticity
Members	Lodovichi Claudia CNR researcher
Research projects	Information on Lodovichi's research activities and publications are available at: http://www.in.cnr.it/index.php/it/9-people/70-claudia-lodovichi
Publications	

29 - Enlightening Brain Mechanisms

Principal Investigator	Dr. Marco Dal Maschio ORCID https://orcid.org/0000-0003-0150-6647 Scopus 650669295 WoS ID G-3871-2017
Contact	marco.dalmaschio@unipd.it 049 827-6483 website
Keywords	Systems Neuroscience; Sensori-motor integrations; Functional Brain Imaging; Psychophysics; Psychobiology; Light-based Technologies; Optogenetics
Members	Dal Maschio Marco — Assistant Professor (RTDb) Canato Marta — Research assistant Archetti Anna — Postdoc Miletto Petrazzini Maria Elena — Postdoc
Research projects	- *FLAMMES - On-chip metasurface-based neuroimaging platform toward high-throughput drug screening in freely behaving animal* (MSCA IF - Archetti) - *How do we know what we don't know?: using zebrafish to study the evolutionary roots of metacognition - MetaZeb* (STARS StG Miletto Petrazzini) - *PINK: Intimate partner violence disrupts the brain-heart axis in women* (MSCA-IF - Agrimi)
Publications	Bruzzone, Matteo, Enrico Chiarello, Marco Albanesi, Maria Elena Miletto Petrazzini, Aram Megighian, Claudia Lodovichi, and Marco dal Maschio. 2021. 'Whole Brain Functional Recordings at Cellular Resolution in Zebrafish Larvae with 3D Scanning Multiphoton Microscopy'. Scientific Reports 11 (1): 11048. https://doi.org/10.1038/s41598-021-90335-y Maschietto, M., M. Dal Maschio, S. Girardi, and S. Vassanelli. 2021. 'In Situ Electroporation of Mammalian Cells through SiO2 Thin Film Capacitive Microelectrodes'. Scientific Reports 11 (1): 15126. https://doi.org/10.1038/s41598-021-94620-8 Maset, Andrea, Marco Albanesi, Antonio di Soccio, Martina Canova, Marco dal Maschio, and Claudia Lodovichi. 2021. 'Aberrant Patterns of Sensory-Evoked Activity in the Olfactory Bulb of LRRK2 Knockout Mice'. Cells 10 (11): 3212. https://doi.org/10.3390/cells10113212

30 - Genetics of focal epilepsies

Principal Investigator	Dr. Nobile Carlo ORCID https://orcid.org/0000-0002-0634-2218 Scopus 7006001212
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Keywords	Genetic epilepsy; Temporal Lobe Epilepsy; ADLTE; Reelin; LGI1;
Members	Nobile Carlo CNR researcher Dazzo Emanuela CNR researcher
Research projects	Information on Nobile's research activities and publications are available at: http://www.in.cnr.it/index.php/it/9-people/74-carlo-nobile
Publications	

31 - Migraine Pathophysiology

Principal Investigator	Prof. Daniela Pietrobon ORCID https://orcid.org/0000-0002-5148-8670 Scopus 7003670065 Google Scholar Daniela Pietrobon
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Keywords	Neuroscience; Neurological Diseases; Neurobiology; Neurophysiology; Electrophysiology; Cellular Neuroscience; Synaptic Transmission;
Members	Pietrobon Daniela — Full Professor Marchionni Ivan — Research Associate (RTDa) Tottene Angelita — Research Assistant Vitale Marina — Postdoc
Research projects	- *Cellular and circuit mechanisms of migraine: a multiscale approach* (PRIN)
Publications	Crivellaro, Giovanna, Angelita Tottene, Marina Vitale, Marcello Melone, Giorgio Casari, Fiorenzo Conti, Mirko Santello, and Daniela Pietrobon. 2021. 'Specific Activation of GluN1-N2B NMDA Receptors Underlies Facilitation of Cortical Spreading Depression in a Genetic Mouse Model of Migraine with Reduced Astrocytic Glutamate Clearance'. Neurobiology of Disease 156 (August): 105419. https://doi.org/10.1016/j.nbd.2021.105419 Parker, Patrick D., Pratyush Suryavanshi, Marcello Melone, Punam A. Sawant-Pokam, Katelyn M. Reinhart, Dan Kaufmann, Jeremy J. Theriot, et al. 2021. 'Non-Canonical Glutamate Signaling in a Genetic Model of Migraine with Aura'. Neuron 109 (4): 611-628.e8. https://doi.org/10.1016/j.neuron.2020.11.018

32 - Molecular and cellular mechanisms of neurodegenerative and neuromuscular diseases

Principal Investigator	Prof. Alessandro Bertoli ORCID https://orcid.org/0000-0003-1202-0191 Scopus 7005055131 WoS ID C-1903-2014 Google Scholar Alessandro Bertoli
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Keywords	Biochemistry; Prion Protein; Molecular Biology; Neuroscience; Protein Aggregation; Biotechnology; Neurodegeneration
Members	Bertoli Alessandro — Researcher (ric. universitario) Lopreiato Raffaele — Researcher (ric. universitario) Sartori Geppo — Researcher (ric. universitario) Massimino Maria Lina — CNR researcher Tonello Fiorella — CNR researcher Peggion Caterina — Postdoc Granuzzo Sara — Research fellow Maldi Arianna — Research fellow Calderan Cristina — PhD Student
University - Business collaborations	- *ITALIANA BIOTECNOLOGIE SRL "Creazione e caratterizzazione funzionale di ceppi di lievito geneticamente modificati per applicazioni fermentative industriali di tipo enologico"* (Lopreiato)
Publications	Basile, Arianna, Fabio De Pascale, Federico Bianca, Alessandro Rossi, Martina Frizzarin, Nicola De Bernardini, Matteo Bosaro, et al. 2021. 'Large-Scale Sequencing and Comparative Analysis of Oenological Saccharomyces Cerevisiae Strains Supported by Nanopore Refinement of Key Genomes'. Food Microbiology 97 (August): 103753. https://doi.org/10.1016/j.fm.2021.103753 Peggion, Caterina, Maria Lina Massimino, Raphael Severino Bonadio, Federica Lia, Raffaele Lopreiato, Stefano Cagnin, Tito Calì, and Alessandro Bertoli. 2021. 'Regulation of Endoplasmic Reticulum–Mitochondria Tethering and Ca2+ Fluxes by TDP-43 via GSK3β'. International Journal of Molecular Sciences 22 (21): 11853. https://doi.org/10.3390/ijms222111853 Peggion, Caterina, Maria Lina Massimino, Roberto Stella, Raissa Bortolotto, Jessica Agostini, Arianna Maldi, Geppo Sartori, Fiorella Tonello, Alessandro Bertoli, and Raffaele Lopreiato. 2021. 'Nucleolin Rescues TDP-43 Toxicity in Yeast and Human Cell Models'. Frontiers in Cellular Neuroscience 15 (April): 625665. https://doi.org/10.3389/fncel.2021.625665 Stella, Roberto, Raphael Severino Bonadio, Stefano Cagnin, Maria Lina Massimino, Alessandro Bertoli, and Caterina Peggion. 2021. 'Perturbations of the Proteome and of Secreted Metabolites in Primary Astrocytes from the HSOD1(G93A) ALS Mouse

	Model'. International Journal of Molecular Sciences 22 (13): 7028. https://doi.org/10.3390/ijms22137028

33 - Neuronal networks physiology and neurotechnologies (NeuroChip lab)

Principal Investigator	Prof. Stefano Vassanelli ORCID https://orcid.org/0000-0003-0389-8023 Scopus 6602922285 Google Scholar Stefano Vassanelli
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Keywords	Neuroscience; Neuron; Synapses; Neurobiology; Electrophysiology; Neurobiology and Brain Physiology; Synaptic Plasticity; Neurophysiology; Cellular Neuroscience; Neural Plasticity
Members	Vassanelli Stefano — Associate Professor Mariani Benedetta — Research Assistant Maschietto Marta — Research Assistant Bisio Marta — Postdoc Cecchetto Claudia — Postdoc
Research projects	- *SYNCH-A SYnaptically connected brain-silicon Neural Closed-loop Hybrid system* (FET- Proact) - *Neureka - A smart, hybrid neural-computo device for drug discovery* (FET-Open Neureka) - *Autonomous In-vivo Brain-Machine-Interface in 28nm-CMOS technology with Ultrasound-based Power-Harvester and Communication-Link (Brain28nm)* (PRIN)
Publications	Cecchetto, Claudia, Stefano Vassanelli, and Bernd Kuhn. 2021. 'Simultaneous Two-Photon Voltage or Calcium Imaging and Multi-Channel Local Field Potential Recordings in Barrel Cortex of Awake and Anesthetized Mice'. Frontiers in Neuroscience 15 (November): 741279. https://doi.org/10.3389/fnins.2021.741279 Mariani, Benedetta, Giorgio Nicoletti, Marta Bisio, Marta Maschietto, Roberto Oboe, Alessandro Leparulo, Samir Suweis, and Stefano Vassanelli. 2021. 'Neuronal Avalanches Across the Rat Somatosensory Barrel Cortex and the Effect of Single Whisker Stimulation'. Frontiers in Systems Neuroscience 15 (August): 709677. https://doi.org/10.3389/fnsys.2021.709677 Maschietto, M., M. Dal Maschio, S. Girardi, and S. Vassanelli. 2021. 'In Situ Electroporation of Mammalian Cells through SiO2 Thin Film Capacitive Microelectrodes'. Scientific Reports 11 (1): 15126. https://doi.org/10.1038/s41598-021-94620-8 Saggese, Gerardo, Mattia Tambaro, Elia A. Vallicelli, Antonio G. M. Strollo, Stefano Vassanelli, Andrea Baschirotto, and Marcello De Matteis. 2021. 'Comparison of Sneo-Based Neural Spike Detection Algorithms for Implantable Multi-Transistor Array Biosensors'. Electronics 10 (4): 410.

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Sorrenti, Vincenzo, Claudia Cecchetto, Marta Maschietto, Stefano Fortinguerra, Alessandro Buriani, and Stefano Vassanelli. 2021. 'Understanding the Effects of Anesthesia on Cortical Electrophysiological Recordings: A Scoping Review'. International Journal of Molecular Sciences 22 (3): 1286. https://doi.org/10.3390/ijms22031286

Tambaro, Mattia, Marta Bisio, Marta Maschietto, Alessandro Leparulo, and Stefano Vassanelli. 2021. 'FPGA Design Integration of a 32-Microelectrodes Low-Latency Spike Detector in a Commercial System for Intracortical Recordings'. Digital 1 (1): 34–53. https://doi.org/10.3390/digital1010003

34 - Neuron-glia signaling in brain function and dysfunction

Principal Investigator	Dr. Giorgio Carmingnoto ORCID https://orcid.org/0000-0003-3063-6774 Google Scholar Giorgio Carmignoto Scopus 7003762792 WoS ID A-8375-2018	
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Keywords		
Members	Carmignoto Piergiorgio Chiavegato Angela Marcon Iacopo Requie Linda Maria	CNR researcher Research Assistant PhD Student PhD Student
Research projects	Information on Carmignoto's research activities and publications are available at: http://www.in.cnr.it/index.php/it/9-people/62-piergiorgio-carmignoto	
Publications		

35 - Neuroparalysis and Neuroregeneration Lab

Principal Investigator	Prof. Ornella Rossetto ORCID https://orcid.org/0000-0002-6113-3857 Scopus 7003372229 Google Scholar Rossetto Ornella
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Keywords	Botulinum neurotoxins, neuromuscular junction, peripheral nerve regeneration, peripheral neuropathies, Drosophila Neurophysiology and Behavior
Members	Rossetto Ornella — Associate Professor Megighian Aram — Associate Professor Rigoni Michela — Associate Professor Pirazzini Marco — Assistant Professor (RTDb) Simonato Morena — CNR Research Assistant Zanetti Giulia — Postdoc Negro Samuele — Research Fellow Stazi Marco — Research Fellow Amoretti Stefano — PhD Student D'Este Giorgia — PhD Student Fabris Federico — PhD Student Tonellato Marika — PhD Student
Research projects	- *RES-ENDO - REgulation of Sprouting by signalling ENDOsomes in fast and slow motoneurons paralyzed by botulinum neurotoxins* (CARIPARO - Pirazzini)
University - Business collaboration	- *Fastox Pharma SA Rep. 1/2021 "Effect of postsynaptic inhibitors on bont action"*
Publications	Bruzzone, Matteo, Enrico Chiarello, Marco Albanesi, Maria Elena Miletto Petrazzini, Aram Megighian, Claudia Lodovichi, and Marco dal Maschio. 2021. 'Whole Brain Functional Recordings at Cellular Resolution in Zebrafish Larvae with 3D Scanning Multiphoton Microscopy'. Scientific Reports 11 (1): 11048. https://doi.org/10.1038/s41598-021-90335-y Caratelli, Veronica, Silvia Fillo, Nino D'Amore, Ornella Rossetto, Marco Pirazzini, Maria Moccia, Concetta Avitabile, Danila Moscone, Florigio Lista, and Fabiana Arduini. 2021. 'Paper-Based Electrochemical Peptide Sensor for on-Site Detection of Botulinum Neurotoxin Serotype A and C'. Biosensors and Bioelectronics 183 (July): 113210. https://doi.org/10.1016/j.bios.2021.113210 Megighian, Aram, Marco Pirazzini, Federico Fabris, Ornella Rossetto, and Cesare Montecucco. 2021. 'Tetanus and Tetanus Neurotoxin: From Peripheral Uptake to Central Nervous Tissue Targets'. Journal of Neurochemistry 158 (6): 1244–53.

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Stazi, Marco, Samuele Negro, Aram Megighian, Giorgia D'Este, Michele Solimena, Ralf Jockers, Florigio Lista, Cesare Montecucco, and Michela Rigoni. 2021. 'Melatonin Promotes Regeneration of Injured Motor Axons via MT 1 Receptors'. Journal of Pineal Research 70 (1). https://doi.org/10.1111/jpi.12695

Zanetti, Giulia, Andrea Mattarei, Florigio Lista, Ornella Rossetto, Cesare Montecucco, and Marco Pirazzini. 2021. 'Novel Small Molecule Inhibitors That Prevent the Neuroparalysis of Tetanus Neurotoxin'. Pharmaceuticals 14 (11): 1134. https://doi.org/10.3390/ph14111134

36 - Pathogenesis of neurological and neuromuscular diseases

Principal Investigator	Prof. Maria Pennuto ORCID https://orcid.org/0000-0001-8634-0767 Scopus 55897284500 WoS ID E-3270-2019 Google Scholar Maria Pennuto
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Keywords	Neurodegeneration; Brain; Neurodegenerative Diseases; Neuroscience; Proteins; Neurobiology; Alzheimer's Disease; Immunohistochemistry; Cell Culture; Neurobiology and Brain Physiology
Members	Maria Pennuto — Associate Professor Banani Noura — Postdoc Trani Giulia — Postdoc Baratto Nicole — Research fellow Boschelle Chiara — Research fellow Bregolin Elisa — Research fellow Di Chiara Lisa — Research fellow Fanotti Nadia — Research fellow Marchioretti Caterina — Research fellow Migazzi Alice — Research fellow Andreotti Roberta — PhD Student Aravamudhan Aishwarya — PhD Student Boschelle Chiara — PhD Student Bregolin Elisa — PhD Student
Research projects	- *Targeting AR CO-Regulators to attenuate spinal and bulbar muscular atrophy* (AFM Telethon) - *Targeting von Hippel Lindau protein/androgen receptor functional interaction to tackle renal cell carcinoma* (AIRC) - *MOVEMeNt-Decoding alpha motor neurons diversity and selective vulnerability to disease* (MSCA-IF) - *The interplay between the "RNA/protein quality control system" and "exosomes" as a spreading mechanism in amyotrophic lateral sclerosis* (PRIN) - *MOSAIC - Decoding diversity and eclectic vulnerability of alpha motor neuron classes in the adult spinal cord* (STARS-StG - Zuccaro) - *Alternative translation initiation as a novel strategy to block toxicity of the mutant Androgen Receptor in SBMA* (Telethon)
University - Business collaborations	- *CNCCS esecuzione quote di ricerca Progetto B-"Centro per la Ricerca di nuovi farmaci per Malattie Rare, Trascurate e della Povertà"* - *Arvinas Androgen Receptor, Inc. (USA)"Testing ARV110 in the animal model*

	generated by Prof Maria Pennuto and described in CHivet et al., 2020"
Publications	Klionsky, Daniel J., Amal Kamal Abdel-Aziz, Sara Abdelfatah, Mahmoud Abdellatif, Asghar Abdoli, Steffen Abel, Hagai Abeliovich, et al. 2021. 'Guidelines for the Use and Interpretation of Assays for Monitoring Autophagy (4th Edition) 1'. Autophagy 17 (1): 1–382. https://doi.org/10.1080/15548627.2020.1797280 Lim, Wooi F., Mitra Forouhan, Thomas C. Roberts, Jesse Dabney, Ruth Ellerington, Alfina A. Speciale, Raquel Manzano, et al. 2021. 'Gene Therapy with AR Isoform 2 Rescues Spinal and Bulbar Muscular Atrophy Phenotype by Modulating AR Transcriptional Activity'. Science Advances 7 (34): eabi6896. https://doi.org/10.1126/sciadv.abi6896 Martínez-Rojas, Vladimir A., Daniele Arosio, Maria Pennuto, and Carlo Musio. 2021. 'Clenbuterol-Sensitive Delayed Outward Potassium Currents in a Cell Model of Spinal and Bulbar Muscular Atrophy'. Pflügers Archiv - European Journal of Physiology 473 (8): 1213–27. https://doi.org/10.1007/s00424-021-02559-6 Migazzi, Alice, Chiara Scaramuzzino, Eric N. Anderson, Debasmita Tripathy, Ivó H. Hernández, Rogan A. Grant, Michela Roccuzzo, et al. 2021. 'Huntingtin-Mediated Axonal Transport Requires Arginine Methylation by PRMT6'. Cell Reports 35 (2): 108980. https://doi.org/10.1016/j.celrep.2021.108980. Pasetto, Laura, Stefano Callegaro, Alessandro Corbelli, Fabio Fiordaliso, Deborah Ferrara, Laura Brunelli, Giovanna Sestito, et al. 2021. 'Decoding Distinctive Features of Plasma Extracellular Vesicles in Amyotrophic Lateral Sclerosis'. Molecular Neurodegeneration 16 (1): 52. https://doi.org/10.1186/s13024-021-00470-3 Spagnolli, Giovanni, Tania Massignan, Andrea Astolfi, Silvia Biggi, Marta Rigoli, Paolo Brunelli, Michela Libergoli, et al. 2021. 'Pharmacological Inactivation of the Prion Protein by Targeting a Folding Intermediate'. Communications Biology 4 (1): 62. https://doi.org/10.1038/s42003-020-01585-x Zuccaro, Emanuela, Diana Piol, Manuela Basso, and Maria Pennuto. 2021. 'Motor Neuron Diseases and Neuroprotective Peptides: A Closer Look to Neurons'. Frontiers in Aging Neuroscience 13 (September): 723871. https://doi.org/10.3389/fnagi.2021.723871

37 - Plasticity In Pathology

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Keywords	Neuron; EEG; Neurological Diseases; Neurophysiology; Electroencephalography; Plasticity; Molecular Biology; Neurobiology; Cell Biology; Neuroscience
Members	Caleo Matteo — Full Professor Allegra Manuela — CNR researcher Gómez-Gonzalo Marta — CNR researcher Losi Gabriele — CNR researcher Mariotti Letizia — CNR researcher Zonta Micaela — CNR researcher Chiavegato Angela — Research Assistant Varani Stefano — Postdoc Goisis Rosa Chiara — Research fellow Cesare Elisa — PhD Student Speggiorin Michele — PhD student Testa Alessandra Maria — PhD student Vignozzi Livia — PhD student
Research projects	- *Modulation of neuron-astrocyte signalling combined with motor training as an innovative approach to enhance recovery after stroke -aSTROke* (CARIPARO) - *Physiological neuronal activity in the control of glioma progression and tumor microenvironment* (PRIN)
Publications	Agostini, M., F. Amato, M.L. Vieri, G. Greco, I. Tonazzini, L. Baroncelli, M. Caleo, et al. 2021. 'Glial-Fibrillary-Acidic-Protein (GFAP) Biomarker Detection in Serum-Matrix: Functionalization Strategies and Detection by an Ultra-High-Frequency Surface-Acoustic-Wave (UHF-SAW) Lab-on-Chip.' Biosensors and Bioelectronics 172 (January): 112774. https://doi.org/10.1016/j.bios.2020.112774 Boltze, Johannes, Jaroslaw A. Aronowski, Jerome Badaut, Marion S. Buckwalter, Matteo Caleo, Michael Chopp, Kunjan R. Dave, et al. 2021. 'New Mechanistic Insights, Novel Treatment Paradigms, and Clinical Progress in Cerebrovascular Diseases'. Frontiers in Aging Neuroscience 13 (January): 623751. https://doi.org/10.3389/fnagi.2021.623751 Chacon-De-La-Rocha, Irene, Gemma L. Fryatt, Andrea D. Rivera, Laura Restani, Matteo Caleo, Diego Gomez-Nicola, and Arthur M. Butt. 2021. 'The Synaptic Blocker Botulinum Toxin A Decreases the Density and Complexity of Oligodendrocyte Precursor Cells in the Adult Mouse Hippocampus'. Journal of

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Conti, S., C. Spalletti, M. Pasquini, N. Giordano, N. Barsotti, M. Mainardi, S. Lai, et al. 2021. 'Combining Robotics with Enhanced Serotonin-Driven Cortical Plasticity Improves Post-Stroke Motor Recovery'. Progress in Neurobiology 203 (August): 102073. https://doi.org/10.1016/j.pneurobio.2021.102073

Greco, Francesco, Federica Anastasi, Luca Fidia Pardini, Marialaura Dilillo, Eleonora Vannini, Laura Baroncelli, Matteo Caleo, and Liam A. McDonnell. 2021. 'Longitudinal Bottom-Up Proteomics of Serum, Serum Extracellular Vesicles, and Cerebrospinal Fluid Reveals Candidate Biomarkers for Early Detection of Glioblastoma in a Murine Model'. Molecules 26 (19): 5992. https://doi.org/10.3390/molecules26195992

Jurkute, Neringa, Michele Bertacchi, Gavin Arno, Chiara Tocco, Ungsoo Samuel Kim, Adam M Kruszewski, Robert A Avery, et al. 2021. 'Pathogenic NR2F1 Variants Cause a Developmental Ocular Phenotype Recapitulated in a Mutant Mouse Model'. Brain Communications 3 (3): fcab162. https://doi.org/10.1093/braincomms/fcab162

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Vannini, Eleonora, Elisabetta Mori, Elena Tantillo, Gudula Schmidt, Matteo Caleo, and Mario Costa. 2021. 'CTX-CNF1 Recombinant Protein Selectively Targets Glioma Cells In Vivo'. Toxins 13 (3): 194. https://doi.org/10.3390/toxins13030194

Physical Activity and Health

38 - Nutrition and Exercise Lab (NUTEXlab)

Principal Investigator	Prof. Antonio Paoli ORCID https://orcid.org/0000-0003-0474-4229 Scopus 24081140700 WoS ID A-6151-2015 Google Scholar Antonio Paoli
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Keywords	Sports Science; Exercise Science; Exercise Performance; Nutrition; Exercise Physiology; Metabolism; Exercise Testing; Strength & Conditioning; Sport Physiology; Muscle Physiology;
Members	Paoli Antonio — Full Professor Bosco Gerardo — Associate Professor Marcolin Giuseppe — Assistant Professor (RTDb) Moro Tatiana — Assistant Professor (RTDb) Casolo Andrea — Research Associate (RTDa) Bondi' Michela — Research Assistant Del Torto Alessio — Postdoc Brizzolari Andrea — Research Fellow Giacon Tommaso Antonio — Research Fellow Hoareau Melanie — Research Fellow Schiavinotto Giorgia — Research Fellow
Research projects	- *ACTLIFE: is active lifestyle enough for health and wellbeing?* (PRIN)
University - Business collaborations	- Consorzio del Formaggio Parmigiano Reggiano Rep 145/2020 "*Effetti del Parmigiano Reggiano nella risposta muscolare all'esercizio con sovraccarichi nell'anziano*" (Moro) - GIANLUCA MECH SPA Rep. 25/2018 per "attività di ricerca nel campo della nutrizione e dell'esercizio fisico con particolare riguardo verso le diete a basso contenuto di carboidrati"(Paoli)
Publications	Antonio Paoli, A., Laura Mancin, Massimiliano Caprio, Elena Monti, Marco V. Narici, Lorenzo Cenci, Fabio Piccini, Matteo Pincella, Davide Grigoletto, and Giuseppe Marcolin. 2021. 'Effects of 30 Days of Ketogenic Diet on Body Composition, Muscle Strength, Muscle Area, Metabolism, and Performance in Semi-Professional Soccer Players'. Journal of the International Society of Sports Nutrition 18 (1): 62. https://doi.org/10.1186/s12970-021-00459-9 Bezerra, Ewertton DE S., Fernando Diefenthaeler, João Pedro Nunes, Raphael L. Sakugawa, Isabel Heberle, Bruno M. Moura, Antônio R. P. Moro, Giuseppe Marcolin,

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Drid, Patrik, Emerson Franchini, João Paulo Lopes-Silva, David H. Fukuda, Adam J. Wells, Nemanja Lakicevic, Antonino Bianco, et al. 2021. 'Health Implications of Judo Training'. Sustainability 13 (20): 11403. https://doi.org/10.3390/su132011403

Hug, François, Simon Avrillon, Alessandro Del Vecchio, Andrea Casolo, Jaime Ibanez, Stefano Nuccio, Julien Rossato, Aleš Holobar, and Dario Farina. 2021. 'Analysis of Motor Unit Spike Trains Estimated from High-Density Surface Electromyography Is Highly Reliable across Operators'. Preprint. Neuroscience. https://doi.org/10.1101/2021.02.19.431376

Lakicevic, N., G. D'Antona, A. Paoli, A. Bianco, N. Maksimovic, S. Ostojic, and P. Drid. 2021. 'Behind the Mask: Rethinking the Use of Face Masks While Exercising'. Science & Sports 36 (5): 430–32. https://doi.org/10.1016/j.scispo.2021.02.003

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Narici, Marco, Jamie McPhee, Maria Conte, Martino V. Franchi, Kyle Mitchell, Sara Tagliaferri, Elena Monti, et al. 2021. ‘Age‐related Alterations in Muscle Architecture Are a Signature of Sarcopenia: The Ultrasound Sarcopenia Index’. Journal of Cachexia, Sarcopenia and Muscle 12 (4): 973–82. https://doi.org/10.1002/jcsm.12720

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Panizzolo, Fausto Antonio, Eugenio Annese, Antonio Paoli, and Giuseppe Marcolin. 2021. ‘A Single Assistive Profile Applied by a Passive Hip Flexion Device Can Reduce the Energy Cost of Walking in Older Adults’. Applied Sciences 11 (6): 2851. https://doi.org/10.3390/app11062851

Paoli, Antonio, Andrea Casolo, Matteo Saoncella, Carlo Bertaggia, Marco Fantin, Antonino Bianco, Giuseppe Marcolin, and Tatiana Moro. 2021. ‘Effect of an Endurance and Strength Mixed Circuit Training on Regional Fat Thickness: The Quest for the “Spot Reduction”’. International Journal of Environmental Research and Public Health 18 (7): 3845. https://doi.org/10.3390/ijerph18073845

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Pedersen, Sigurd, Dag Johansen, Andrea Casolo, Morten B. Randers, Edvard H. Sagelv, Boye Welde, Andreas Kjæreng Winther, and Svein Arne Pettersen. 2021. 'Maximal Strength, Sprint, and Jump Performance in High-Level Female Football Players Are Maintained With a Customized Training Program During the COVID-19 Lockdown'. Frontiers in Physiology 12 (February): 623885. https://doi.org/10.3389/fphys.2021.623885

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Zullo, Giuseppe, Giuseppe Marcolin, Paolo Mistretta, and Nicola Petrone. 2021. 'Effect of Outdoor Footwear Bending Stiffness on Metatarsophalangeal Joint Kinematics, Kinetics, and Energy Balance during Level and Uphill Walking'. Proceedings of the Institution of Mechanical Engineers, Part P: Journal of Sports Engineering and Technology, April, 175433712110087. https://doi.org/10.1177/17543371211008793

EVENTS

Public engagement activities

- ***Incontri di divulgazione per la scuola primaria.*** *Laboratorio "Un castello ben difeso? Basta… un fantastico sistema immunitario!".* Two online events addressed to elementary school classes (6 classes, 2 meetings per class and 113 students involved)
- ***Incontri di divulgazione per la scuola secondaria inferiore.*** *Laboratorio "Small4rare".* Online event (1 junior high school class)
- **Brain Awareness Week**, 18-19 May. Zoom webinar which included, among others, talks from two young researchers of our department.
- ***Kids University*** - Family Edition, 22-29 May 2021. 8 activities organized by our department
- ***"Dietro le quinte della ricerca scientifica"*** Percorso di orientamento per le scuole secondarie superiori (PCTO)**.** 14-18 June. Activities attended by 23 students.
- **Venetonight** 24 September. 8 laboratories organized in presence and 4 videos available in the University's website.
- 21 press releases from our Department

Other activities

- **University Corporate Wellness**
- **DSB Talk Series**, every other Friday
- **Technology transfer in the biomedical sector**, 12 January
- **FISIOTECH** (ECM course), 6 May
- **Potenziare i risultati della ricerca: tra pubblicazioni, brevetti e altro, come puntare ad una ricerca di successo**, 22 June
- **TTO meeting-il toolkit del ricercatore che vuole brevettare**, 7 July
- **Potenziare la relazione tra mondo della ricerca e partner industriali del territorio: spin off e clienti privati dei servizi offerti dal dipartimento**, 18 October

Credits

Initiative:

Prof. Silvio Tosatto - Coordinatore Commissione Terza Missione

Prof. Marco Sandri - Direttore del Dipartimento di Scienze Biomediche

Dott.ssa Silvia Pertegato - Segretario di Dipartimento

Data on staff members:

Dott.ssa Isabella Salvatico - Settore Direzione

Data on projects:

Dott.ssa Laura Colluto - Responsabile Settore Ricerca e Terza Missione

Data on publications:

Dott. Ivan Mičetić - Tecnico informatico

Dott. Alex Pescarolo - Tecnico informatico

June 2022

FOR FURTHER ENQUIRIES
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