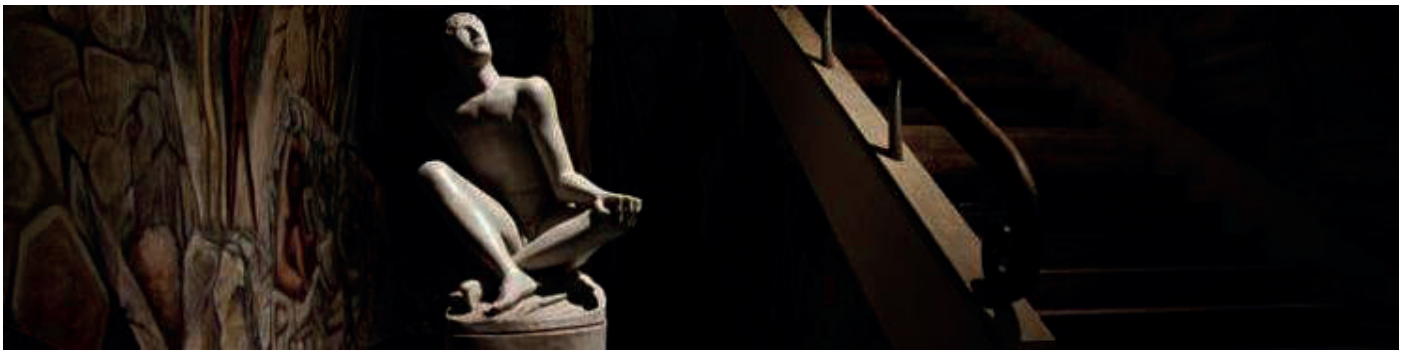
PhD Program in Biomedical Sciences

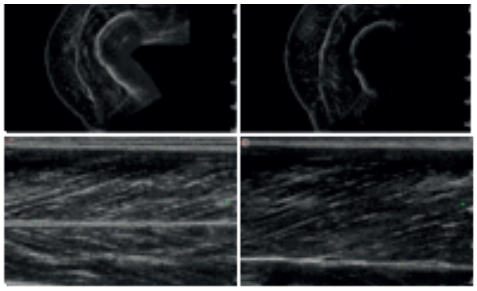
Students Achievements



Sofia Parrasia best poster prize

Sofia Parrasia won the best poster prize for her poster “Conjugation with the cell penetrating peptide Angiopep-2 allows brain delivery of a mitochondriotropic inhibitor of potassium channel Kv1.3” during the virtual 7th European Federation of Medicinal Chemistry (EFMC) Young Medicinal Chemistry Symposium

Elena Monti publication

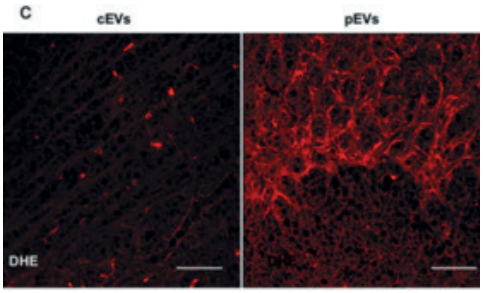


Elena Monti published a paper on “Acta physiologica (Oxf)” (doi: 10.1111/apha.13557) entitled “Are muscle fibres of body builders intrinsically weaker? A comparison with single fibres of aged-matched controls”. In this paper, Elena, with the support of the research team, analysed muscles and muscle biopsies from long-term, highly trained (body-builders) and recreationally active people, with the aim to understand whether extreme muscular hypertrophy would compromise its functionality (as previously suggested). The main finding of this work is that, once external factors (such as the swelling experienced by fibres stored in special solutions for mechanical testing) is accounted for, body builders muscles and muscle fibres size perfectly scale with their contractile capacity, thus suggesting that hypertrophy is not derimental for performance.

Elena Monti publication

Elena Monti published a paper on “Frontiers in Physiology” (doi: 10.3389/fphys.2020.00946) entitled “The Time-Course of Changes in Muscle Mass, Architecture and Power During 6 Weeks of Plyometric Training”. In this paper, Elena and the second author Martino Franchi, with their team, trained young people on a novel and injury-safe machine, focusing on the time-course of the morpho-functional adaptations of muscle to this plyometric-like training protocol. These findings emphasize the erarly changes occurring both in muscle size and strength/power after only 2 weeks of training, helping to plan safe and time-efficient protocols for athletes, recreationally active and also injured people during recovery.

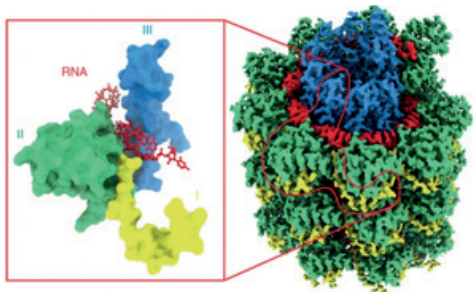
Cristina Liboni & Elisabetta Marcuzzi publication



Cristina Liboni and Elisabetta Marcuzzi are co-author in a paper published on Journal of Extracellular Vesicles where they analysed the properties of the extracellular vesicles (EVs) released by bone marrow mesenchymal stromal cells (MSCs) and explored the possibility of using them to therapeutically target angiogenesis. The results identify novel pathways involved in the crosstalk between endothelial and stromal cell and suggest new therapeutic strategies to target pathological angiogenesis.

Roberta Angioni at al. CD73+ extracellular vesicles inhibit angiogenesis through adenosine A2B receptor signalling, Journal of Extracellular Vesicles, 9:1 (2020), DOI: 10.1080/20013078.2020.1757900

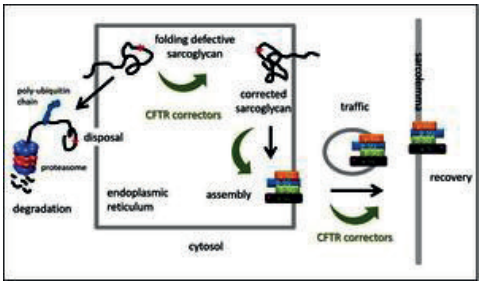
Alessandro Grinzato publication



Alessandro Grinzato and collaborators published a paper on Nature Chemical Biology where they used cryo-electron microscopy (cryo-EM) to reveal the atomic structure of potato virus X (PVX), a plant virus belonging to the Alphaflexiviridae family. The structure was obtained at 2.2 Å resolution – the highest resolution achieved to date for a flexible, filamentous virus. This result opens the way to identify new sites for chemical and/or genetic modification of the virus that could enable it to be used for a wide variety of nanotechnology applications.

Grinzato et al. Atomic structure of potato virus X, the prototype of the Alphaflexiviridae family. Nat Chem Biol16, 564–569 (2020). https://doi.org/10.1038/s41589-020-0502-4

Martina Scano publication



Martina Scano is the second author of a paper published on “International Journal of Molecular Sciences”, investigating the efficacy of the combined administration of CFTR correctors in myotubes deriving from a patient with sarcoglycanopathy, a rare and severe muscular dystrophy. The authors show that these compounds are able to recover a-sarcoglycan missense mutants enhancing the assembly and traffic of the sarcoglycan complex, thus improving the sarcolemma behavior. These data support the view that CFTR correctors could be effective in conditions different from cystic fibrosis, opening new therapeutic opportunities for diseases currently incurable, such as sarcoglycanopathy.

Carotti M et al., Combined Use of CFTR Correctors in LGMD2D Myotubes Improves Sarcoglycan Complex Recovery. Int. J. Mol. Sci. 2020, 21, 1813. DOI: 10.3390/ijms21051813

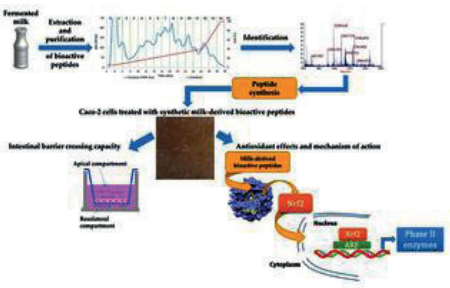
Alessandro Grinzato talk

Alessandro Grinzato presented his latest Cryo-EM structural studies during the first meeting of the biological macromolecular section of the Italian Crystallographic Association.

Davide Steffan foreign experience

Davide Steffan, during a visiting student period, in the Lee Sweeney lab at the University of Florida (Gainesville - USA), had the pleasure to presents his PhD project in a seminar entitled “Identification of a novel TFEB and exercise dependent gene”. This seminar takes place at the sun shining University of Florida - Myology Institute on February 13th, 2020.

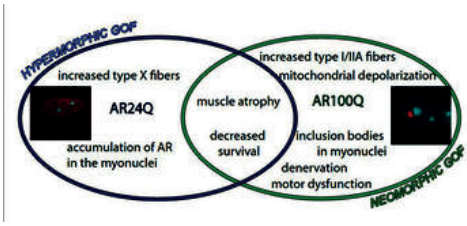
Federica Tonolo publication



Federica Tonolo and colleagues published a paper on Antioxidants where antioxidant milk-derived bioactive peptides were extracted and purified from fermented milk. Once their sequences were identified, the peptides were synthetized, and Caco-2 cells were treated with the selected peptides in order to understand if these molecules could cross the intestinal barrier and which was their molecular mechanism of action in human cells. The peptides were able to activate Keap1/Nrf2 pathway, the major signaling pathway involved in the regulation of redox homeostasis. Moreover, they crossed the Caco-2 monolayer showing that they could be considered as potential ingredients of functional foods.

Tonolo F. et al., Identification of new peptides from fermented milk showing antioxidant properties: mechanism of action. Antioxidants, 2020, 9(2), 117; 10.3390/antiox9020117

Caterina Marchioretti publication



Caterina Marchioretti and colleagues published a cells paper on Polyglutamine (polyQ) expansions in the androgen receptor (AR) gene cause spinal and bulbar muscular atrophy (SBMA). They generated new mouse models of SBMA for constitutive and inducible expression of mutant AR and performed biochemical, histological and functional analyses of phenotype. They show that polyQ-expanded AR causes motor dysfunction, premature death, IIb-to-IIa/IIx fiber-type change, glycolytic-to-oxidative fiber-type switching, upregulation of atrogenes and autophagy genes and mitochondrial dysfunction in skeletal muscle, together with signs of muscle denervation at late stage of disease.

Ana Georgia Dumitras talk

Ana Georgia Dumitras had the opportunity to present her work on the regulation of protein synthesis and muscle plasticity at the IIM 2020

Alessandro Grinzato talk

Alessandro Grinzato was selected to present his work in the Cryo-EM plenary session of the 60th national congress of the Italian Biochemistry Society (SIB).

Alessandro Grinzato best oral award

Grinzato Alessandro won the Luria award for the best oral communication during the 3rt national congress of the Italian society for virology (SIV-ISV)

Davide Steffan talk

Davide Steffan participated at the Interuniversity Institute of Myology Meeting 2019 on 17-20 October. In this occasion, he had his first oral presentation entitled: Identification of a novel TFEB and exercise dependent gene.

Vanessa Jorge Henriques talk

Vanessa Jorge Henriques was selected for an oral presentation at the XIV European Meeting on Glial Cells in Health and Disease which took place in Porto, Portugal on July 2019.

Elena Monti talk

Our PhD student Elena Monti gave an oral talk at the European College of Sport Science (Prague, 3-6 July 2019). The talk was entitled “Increase in Cross Sectional Area is not accompanied by a proportionate increase of Force in Single Muscle Fibres of well trained Body Builders”. This work helped to unravel the mechanisms of muscle hypertrophy from the dingle fibre to the whole muscle level, and was discussed in a international envirnoment with more than 2000 scientists coming from than 30 countries around the world.

Federica Tonolo grant

Tonolo Federica gained the SIB travel grant to cover her three month (May - July 2019) abroad experience that she spent at Research group on Community Nutrition & Oxidative Stress (University of Balearic Island, Spain) under the supervision of Prof. Josep Antoni Tur Marì. She evaluated both molecular and physiological role of oxidative stress in pathogenic conditions, such as obesity and metabolic syndrome, and how these diseases can be treated or prevented by modulating the diet and the lifestyle of the patients, following PREDIMEDplus project.

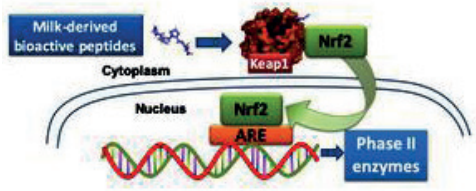
Federica Tonolo talk

Tonolo Federica was selected for an oral presentation at 2nd International Symposium on Bioactive Peptides, held in Valencia (Spain) on May 22-24, 2019, with the communication: F. Tonolo et. al, Milk-derived bioactive peptides exert antioxidant effects on Caco-2 cells activating Keap1-Nrf2 pathway.

Chiara Mazzola foreign experience

Chiara Mazzola has been selected for the IBRO Congress Young Investigator Training Program (YITP) 2019. She had the opportunity to spend one week in Dr. Seok-Kyu Kwon's laboratory at KIST in Seul (South Korea). Thanks to this experience, she had the chance to learn new useful techniques and to apprehend new knowledge on mitochondrial calcium dynamics during neurotransmission. She also participated to the 10th IBRO World Congress of Neuroscience in Daegu (South Korea).

Federica Tonolo publication



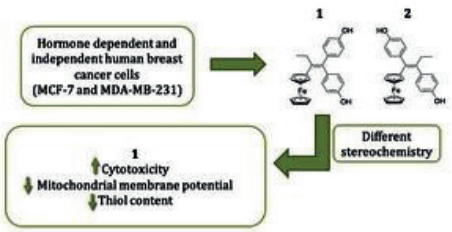
Federica Tonolo and colleagues published a paper on Journal of Functional Foods where they observed that synthetic antioxidant milk-derived bioactive peptides exert their antioxidant function activating Keap1/Nrf2 signalling pathway, the major system involved in the regulation of redox homeostasis.

Tonolo F. et al., Milk-derived bioactive peptides exhibit antioxidant activity through the Keap1-Nrf2 signaling pathway. J Funct Foods, 2020, 64, 103696. DOI: 10.1016/j.jff.2019.103696

Elena Monti publication

Our PhD student Elena Monti published a paper on "Frontiers in Physiology" (doi: 10.3389/fphys.2019.00178) entitled "Bouncing back!Counteracting Muscle Aging With Plyometric Muscle Loading". In this paper, Elena and the first author Martino Franchi, with their team, trained young and elderly people on a novel and injury-safe machine, rescuing the old people lower limb power and reaching values close to those of a young population. This finding contribute to unravel novel training strategies for the increasing-age world population.

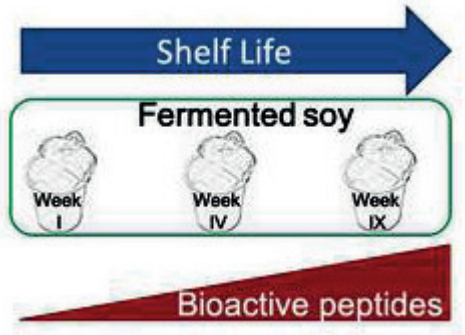
Federica Tonolo publication



Federica Tonolo and colleagues published a paper on ChemMedChem where they analyzed in a couple of human breast cancer cells (MCF-7 and MDA-MB-231) the action of isomers of a ferrocenyl diphenol complex on the thiol system.

Tonolo F. et al., Small structural differences between two ferrocenyl diphenols determine large discrepancies of reactivity and biological effects. ChemMedChem, 2019. DOI: 10.1002/cmdc.201900430

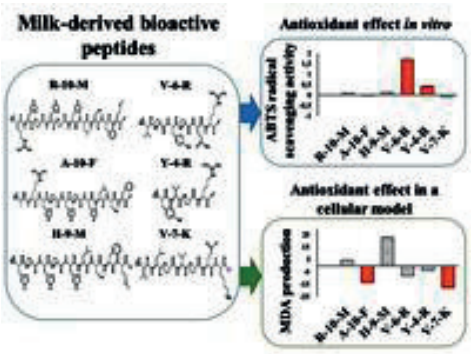
Federica Tonolo publication



Federica Tonolo and colleagues published a paper on Plant Foods for Human Nutrition where they evaluated the antioxidant properties of fermented soy during the shelf life (50 days) and after 2 weeks at the end of the latter. At the end of the shelf life an increase of antioxidant capacity due to the production of bioactive peptides, thanks to the action of the peptidases of the fermenting microorganisms, was observed.

Tonolo F at al., Antioxidant Properties of Fermented Soy during Shelf Life. Plant Foods Hum Nutr. 2019. DOI: 10.1007/s11130-019-00738-6

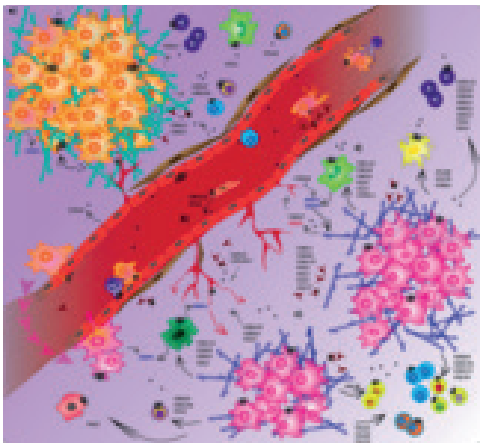
Federica Tonolo publication



Federica Tonolo and colleagues published a paper on Journal of Peptide Science where six milk derived bioactive peptides (Y4R, V6R, V7K, A10F, R10M, and H9M) were synthesized and studied for their antioxidant properties in vitro and in a cellular model.

Tonolo F, et al., Insight into antioxidant properties of milk-derived bioactive peptides in vitro and in a cellular model. J Pept Sci. 2019, 25(5):e3162. DOI: 10.1002/psc.3162

Elisabetta Marcuzzi publication



Elisabetta Marcuzzi and colleagues published a review article on chemokine signalling in the process of tumor growth and metastasis. After describing the chemokine/chemokine receptor axes involved in cancer, the article focuses on their role in regulation of tumor angiogenesis, immune cell recruitment and also on the advantages and limits of current pharmacological strategies targeting chemokine networks for cancer therapy.

Marcuzzi E. et al., Chemokines and Chemokine Receptors: Orchestrating Tumor Metastasization. Int. J. Mol. Sci. 2019, 20, 96. https://doi.org/10.3390/ijms20010096

Alessandro Grinzato foreign experience

Grinzato Alessandro spent five months (November 2018-March 2019) at the Structural Biology group of the European Synchrotron Radiation Facility (ESRF, Grenoble, France) where he had the opportunity to learn how to prepare and collect samples for cryo-EM experiments and create new network possibilities.