

BIOGRAPHICAL SKETCH

NAME: Lombardi, Giovanni

POSITION TITLE: Laboratory Head, Associate Professor of Health Science, Lecturer Laboratory Medicine

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
Università degli Studi di Milano, Milano, Italy	BSc	07/2004	Medical Biotechnology
Università degli Studi di Milano, Milano, Italy	MSc	10/2006	Medical Biotechnology and Molecular Medicine
Università degli Studi di Milano, Milano, Italy	PhD	12/2009	Biochemistry

A. Personal Statement

I am the Group Leader of the Laboratory of Experimental Biochemistry and Advanced Diagnostics at IRCCS Ospedale Galeazzi-Sant'Ambrogio (Milano, Italy), Associate Professor of Health Science at the Poznań University of Physical Education (Poznań, Poland), and Lecturer in Laboratory Medicine at Vita-Salute San Raffaele University (Milano, Italy).

I have a broad background in molecular medicine, general and clinical biochemistry, cell biology and general and clinical molecular biology, with specific training and expertise in bone and muscle pathophysiology. My research is focused on biomarkers discovery in musculoskeletal physiology and pathology in association with senescence and aging. More generally, my research activity ranges from the study of the endocrine function of bone and skeletal muscle tissues to bone-muscle crosstalk, biochemical and molecular markers of bone and skeletal muscle turnover in health and diseases, bone and skeletal muscle senescence, extracellular vesicle-mediated crosstalk, transcriptomics and miRNA and non-coding RNA function and regulation, pre-analytical management of laboratory samples, metabolomics, sports physiology and endocrinology, sports recovery strategies.

As PI or co-Investigator on several intramural-, university-, and government and private entities-funded grants, I laid the groundwork for the proposed research by developing the knowledge on the molecular mechanisms driving bone and skeletal muscle pathophysiological molecular mechanisms that and the related markers, mainly circulating, with a particular focus on miRNAs. I successfully administered the projects (e.g., staffing, research protections, budget), collaborated with other researchers, and produced 197 peer-reviewed publications (citations: 5150, h-index: 37 [Scopus, 2025/05]) from each project. I am involved, and I helped to create, as well, wide and branched research networks, e.g., thanks to the working activities divided onto two EU countries, roles in national and international scientific societies, common scientific interests, contacts with companies, and friendships, that have allowed me several collaborations worldwide. In summary, I have the expertise, leadership, training, expertise, motivation, and-more importantly-a solid and highly supportive research group, necessary to successfully carry out the proposed research project.

Ongoing and recently completed projects that I would like to highlight:

miR-OS

Fondazione UniMi-Seed4Innovation

Role: Team Coordinator

2023-2024

miR-OS: miRNA-based diagnostics signature for muscle wasting in osteoporotic women

RCR-2022-23682286

Italian Ministry of Health-IRCCS Aging Network

Role: WP Coordinator (PI)

2022/01-2024/06

Rete AGING-Next Generation Promising (NGP): a new network approach to frailty, multimorbidity and age-related disease in the Era of Precision Medicine

NCN 2018/29/B/NZ7/02094

Polish National Science Center (NCN)

Role: PI

2019/02-2024/01

Inflammasome - related pathways activation in peripheral blood mononuclear cells and their induced signalling in skeletal muscle cells in response to physical activity -an in vivo-to in vitro translator study

OstMark

CaRiPlo Foundation-Scientific Research Area, Biomedical research on aging-associated diseases

Role: Unit Coordinator

2019/11-2024/05

Osteocalcin in bone metabolism and aging: molecular mechanisms and biomarkers of the bone-energy crosstalk

Citations:

1. Gerosa L, Malvandi AM, Malavolta M, Provinciali M, **Lombardi G**. Exploring cellular senescence in the musculoskeletal system: any insights for biomarkers discovery? Ageing Res Rev 2023;88(2023):101943.
2. Verdelli C, Tavanti GS, Forno I, Vaira V, Maggiore R, Vicentini L, Ciaramella PD, Perticone F, **Lombardi G**, Corbetta S. Osteocalcin modulates parathyroid cell function in human parathyroid tumors. Front Endocrinol 2023;14:1129930.
3. Ponzetti M, Aielli F, Cappariello A, **Lombardi G**, Teti A, Rucci N. Lipocalin 2 Increases After High Intensity Exercise in Humans and Influences Muscle Gene Expression and Differentiation in Mice. J Cell Physiol 2022;237:551–65.
4. Vitale JA, Sansoni V, Faraldi M, Messina C, Verdelli C, **Lombardi G**, Corbetta S. Circulating carboxylated osteocalcin correlates with skeletal muscle mass and risk of fall in postmenopausal osteoporotic women. Front Endocrinol;12:669704.
5. Faraldi M, Gomarasca M, Silvia P, Sansoni V, Banfi G, **Lombardi G**. Effect of collection matrix, platelet depletion, and storage conditions on plasma extracellular vesicles and extracellular vesicle-associated miRNAs measurements. Clin Chem Lab Med 2021;59(5):893-903.

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2025/04

Grant Reviewer, University of Sharjah, United Arab Emirates

2024/11-Present

ASN (1^a Fascia), Ministero dell'Università e della Ricerca, Roma, Italy: 05/E3 Clinical Biochemistry and Clinical Molecular Biology

2024/03-Present

Nominated Member, Joint IOF (International Osteoporosis Foundation) Working Group and IFCC (International Federation of Clinical Chemistry and Laboratory Medicine) Committee on Bone Metabolism (C-BM)

2024/02-Present

Elected Member, Scientific Committee for Research, SIOMMMS (Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro)

2023/03-Present

Nominated Member, Scientific Committee on Bone Metabolism, IFCC (International Federation of Clinical Chemistry and Laboratory Medicine)

2023-Present

Associate Editor, Advances in Health and Sport Science

2022/10-Present Lecturer (Subject Expert), Laboratory Medicine, Vita-Salute San Raffaele University, Milano, Italy

2022-Present Grant Reviewer, MESRaSSR and SAS, Slovak

2022-Present Associate Editor, Scientific Reports

2021-Present Associate Editor, Frontiers in Endocrinology-Bone Section

2020/01-Present Member, EFLM Academy, EFLM (European Federation of Laboratory Medicine)

2020-Present Referent, IRCCS Ospedale Galeazzi-Sant'Ambrogio, Rete IRCCS Aging (Ministero della Salute)

2020-present EuSpLM-European Specialist in Laboratory Medicine, EFLM (European Federation of Laboratory Medicine)

2020-Present Scientific Committee, SIBioC National Congresses

2020-Present Editorial Committee Member, LabTestsOnline.it

2019/12-Present Associate Professor, Health Sciences, Dept. of Athletics, Strength and Conditioning, Poznań University of Physical Education, Poznań, Poland

2019/09-Present Member, FICAFD (Fundación de Investigación en Ciencias de la Actividad Física y del Deporte)

2019-Present Coordinator, IRCCS Ospedale Galeazzi-Sant'Ambrogio, Research line 4: Biochemistry, Genetics, Physiology and Related Systemic Diseases

2018/12-2019/12 Associate Professor, Health Sciences, Dept. of Physiology and Pharmacology, Gdańsk University of Physical Education and Sport, Gdańsk, Poland

2018/09-Present Dr. hab, Centralna Komisja do Spraw Stopni i Tytułów, Warszawa, Polska: Health Sciences

2018/09-Present ASN (2^a Fascia), Ministero dell'Università e della Ricerca, Roma, Italy: 05/E3 Clinical Biochemistry and Clinical Molecular Biology; 06/N2 Physical Exercise and Sport Sciences

2018/06-2018/11 Adjunct, Dept. of Physiology and Pharmacology, Gdańsk University of Physical Education and Sport, Gdańsk, Poland

2018/01-2018/03 Visiting Professor, Dept. of Physiology and Pharmacology, Gdańsk University of Physical Education and Sport, Gdańsk, Poland

2018-2021 Associate Editor, Journal of Science in Sport and Exercise

2017/02-Present Chair, Study group on Clinical biochemistry and metabolism of bone and muscle tissues, SIBioC (Società Italiana di Biochimica Clinica e Biologia Molecolare Clinica-Medicina di Laboratorio)

2017-2021 Adjunct Professor, Laboratory Medicine, Vita-Salute San Raffaele University, Milano, Italy

2017-2018 Lecturer, Interuniversity master course "Theory and methodology of athletic training in soccer" Università Cattolica del Sacro Cuore, Roma-Milano, Italy

2017-Present Advisory Board, Journal of Sport Sciences

2017-Present Deputy chair, Working group on Whole-body cryotherapy, IIR (International Institute of Refrigeration)

2016-Present Head, Laboratory of Experimental Biochemistry and Advanced Diagnostics, IRCCS Ospedale Galeazzi-Sant'Ambrogio, Milano, Italy

2016-Present Member, SIBioC (Società Italiana di Biochimica Clinica e Biologia Molecolare Clinica-Medicina di Laboratorio)

2015-Present Expert panel member/grant reviewer, Polish Narodowe Centrum Nauki (NCN), Poland

2013-Present Member, SIOMMMS (Società Italiana dell'Osteoporosi, del Metabolismo Minerale e delle Malattie dello Scheletro)

2013-2015 PI, Laboratory of Experimental Biochemistry and Molecular Biology, IRCCS Istituto Ortopedico Galeazzi, Milano, Italy

2010-2012 Post-Doc Researcher Laboratory of Experimental Biochemistry and Molecular Biology, IRCCS Istituto Ortopedico Galeazzi, Milano, Italy

2008 Visiting scientist, Viscogliosi Laboratory in Molecular Genetics of Musculoskeletal Diseases, CHU Sainte Justine, Montreal (QC), Canada

2007-2009 Ph.D. Student, Laboratory of Experimental Biochemistry and Molecular Biology, IRCCS Istituto Ortopedico Galeazzi, Milano, Italy

2006/10-2006/12 Post-graduate frequenting scientist, Laboratory of Nutritional Biochemistry, Dept. of Medical Chemistry, Biochemistry and Biotechnology, University of Milano, Milano, Italy

Honors

2016 Presenting Author, European Society of Endocrinology (ESE), European Congress of Endocrinology (ECE), Munich, Germany. Award: Poster Prize

C. Contributions to Science

1. Throughout my career, I have been interested in bone markers, i.e., those compounds that allow the monitoring of the metabolic activity of bone cells, with a specific focus on circulating biomarkers. My early publications were mostly focused on the association of protein and protein-derived markers with physical activity. Thereafter, I moved towards the study of circulating molecular biomarkers (e.g., miRNAs) in association with physical activity as well as in disease conditions, with a focus on standardization, harmonization, and pre-analytical and biological variability. Thanks to my involvement in the IFCC C-BM and Joint IOF Working Group and IFCC C-BM I had the possibility to be involved in the drafting of official guidelines that would drive the clinicians in the correct use of the bone markers. In particular, I led an international initiative that aimed at the standardization of the nomenclature of these markers with the introduction of the new concept of “Bone Status Indices”.
 - a. Sansoni V, **Lombardi G**, Díaz–Garzón J, Calle PF, Bartlett WA, Coşkun A, Itkonen O, Jonker N, Sandberg S, Aarsand AK, Banfi G, Carobene A, on behalf of the European Federation of Clinical Chemistry and Laboratory Medicine Working Group on Biological Variation. Novel biomarkers in bone pathophysiology: establishing reference intervals and biological variations estimates for serum leptin, sclerostin, lipocalin-2, osteoprotegerin, resistin and Dickkopf-related protein-1 from the European Biological Variation Study (EuBIVAS) Populations. Clin Chimica Acta 2025;570(2025):120213
 - b. Bhattoa HP, Vasikaran S, Trifonidi I, Kapoula G, **Lombardi G**, Jørgensen NR, Pikner R, Miura M, Chapurlat R, Hilgsmann M, Haarhaus M, Evenepoel P, Jørgensen HS; Herrmann M, Kaufman JM, Clark P, Tuzun S, Al-Daghri N, Silverman S, Alokail MS, Ormarsdóttir S, Prieto Yerro MC, Matijevic R, Laslop A, da Silva Rosa MMC, Zakraoui L, Burlet N, McCloskey E, Harvey NC, Radermecker RP, Fusaro M, Torre C, Kanis JA, Rizzoli R, Reginster JY, Makris K, Cavalier E. Update on the Role of Bone Turnover Markers in the Diagnosis and Management of Osteoporosis. A Consensus Paper from The European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO), International Osteoporosis Foundation (IOF), and International Federation of Clinical Chemistry and Laboratory Medicine (IFCC). Osteoporos Int. ePub Ahead of Print
 - c. **Lombardi G**, Jørgensen NR, Harvey NC, McCloskey EV, Åkesson KE, Eastell R, Garnero P, Kanis JA, Khashayar P, Lane NE, McClung MR, Silverman S, Makris K, Bhattoa HP, Vasikaran SD, Pikner R, Cavalier E. Guidelines for the correct use of the nomenclature of biochemical indices of bone status: a position statement of the IFCC Committee on Bone Metabolism and the Joint IOF Working Group and IFCC Committee on Bone Metabolism. Clin Chem Lab Med 2025;63(4):704-11
 - d. Xu J, **Lombardi G**, Jiao W, Banfi G. Effects of exercise on bone status in female subjects from young girls to postmenopausal women: an overview of systematic reviews and meta-analyses. Sports Med 2016;46(8):1165-82.
2. More recently, my research group and I have addressed efforts into the study of senescence and aging of bone and skeletal muscle tissues, as main determinants of musculoskeletal dysfunctions. In this field we propaedeutically developed methods to efficiently extract high quality proteins and RNA from bone samples. Later, thanks to the acquisition of personnel with a relevant know-how in metabolomics, as well as the availability of highly innovative equipment made available by ISB BioLabs Srl, hosted in our laboratories, we moved towards the development of methods for the extraction of metabolites from bone samples. We have developed an *in vitro* model of myoblast senescence, from which we have derived sarcopenic-like myotubes, that is currently at the center

of our research in this field. In parallel, our membership in the IRCCS Aging Network of the Italian Ministry of Health (of which I have been the National Coordinator of the WP-Biomarkers), has allowed us to cooperate with other Italian IRCCS hospitals and to investigate different biomarkers associated with aging, and frailty.

- a. Faraldi M, Provinciali M, Di Rosa M, Moresi R, Sansoni V, Gomasasca M, Gerosa L, Malvandi AM, Lattanzio F, Banfi G, **Lombardi G**. Circulating biomarkers associated with walking performance in elderly subjects: exploring miRNAs, metabolic and inflammatory biomarkers. *GeroScience*. ePub Ahead of Print
 - b. Malvandi AM, Haliaj E, Faraldi M, Mangiavini L, Cristoni S, Leoni V, Lombardi G. Enhanced Molecular Release from Elderly Bone Samples Using Collagenase I: Insights into Fatty Acid Metabolism Alterations. *J Transl Med* 2024;22:143.
 - c. Gerosa L, Malvandi AM, Gomasasca M, Verdelli, Sansoni V, Faraldi M, Ziemann E, Olivieri F, Banfi G, Lombardi G. Murine myoblasts exposed to SYUIQ-5 acquire senescence phenotype and differentiate into sarcopenic-like myotubes, an in vitro study. *J Gerontol A Biol Sci Med Sci* 2024;79(4):glae022.
 - d. Marchegiani F, Recchioni R, Di Rosa M, Piacenza F, Marcheselli F, Bonfigli AR, Galeazzi R, Matakchione G, Cardelli M, Procopio AD, Corsonello A, Cherubini A, Antonicelli R, Lombardi G, Lattanzio F, Olivieri F. Low circulating levels of miR-17 and miR-126-3p are associated with increased mortality risk in geriatric hospitalized patients affected by cardiovascular multimorbidity. *GeroScience* 2024; 46(2):2531-44.
 - e. Faraldi M, Mangiavini L, Conte C, Banfi G, Napoli N, Lombardi G. A novel methodological approach to simultaneously extract high quality total RNA and proteins from cortical and trabecular bone. *Open Biol* 2022;12:210387.
3. The most recent aspect I am investigating, in the field of musculoskeletal pathophysiology, is bone-muscle crosstalk. This is a new concept in musculoskeletal pathophysiology and, thanks to collaboration with outstanding researchers worldwide, we are investigating the effects of muscle senescence on bone functioning. To this end, we have patented (UIBM: 102022000023046, under evaluation for extension to EU and USA), and published about, a circulating miRNA signature, a first attempt to develop a diagnostic tool to be used to assess muscle mass loss in osteoporotic women.
- a. Malvandi AM, Gerosa L, Banfi G, **Lombardi G**. The bone-muscle unit: from mechanical coupling to soluble factors-mediated signaling. *Mol Aspects Med* 2025;103:101367
 - b. Kirk B, **Lombardi G**, Duque G. Bone and muscle crosstalk in aging and disease. *Nat Rev Endocrinol* 2025;21:375-390
 - c. Faraldi M, Sansoni V, Vitale J, Gomasasca M, Verdelli C, Messina C, Sconfienza L, Banfi G, Corbetta S, **Lombardi G**. Plasma micro-RNA signature associated with skeletal muscle wasting in postmenopausal osteoporotic women. *J Cachexia Sarcopenia Muscle* 2024;15:690-701.

Complete List of Published Work in: <http://orcid.org/0000-0002-8365-985X>