

Andrea Benzi

Assistant professor

EDUCATION AND TRAINING

01/09/2015–30/10/2018

Curricular internship activity

Research activity involving biochemistry and molecular biology techniques
Department of Experimental Medicine (DIMES), Biochemistry, University of Genova

01/10/2013–28/10/2016

bachelor's degree in Biotechnology

98/110

Title: Expression and characterization of a glycosyl-transferase involved in sugar metabolism
University of Genova

01/10/2016–06/11/2018

master's degree in medical pharmaceutical Biotechnology

110/110

Title: Characterization of an enzyme involved in Catel-Manzke syndrome,
University of Genova

01/11/2018–31/01/2022

PhD in Experimental Medicine (Biochemistry)

Tutor: Prof. Santina Bruzzone

Title: The role of CD38 and TRPM2 in adipose tissue and liver during thermogenesis,
Department of Experimental Medicine (DIMES), Biochemistry, University of Genova

Since 2021

Passed the government test and licensed as profession biologist

PROFESSIONAL HISTORY

01/02/2022–31/01/2023

Research fellowship

Department of Experimental Medicine (DIMES), Biochemistry, University of Genova

01/02/2023- 30/09/2025

post-Doc position

Department of Experimental Medicine (DIMES), Biochemistry, University of Genova

01/10/2025–present

Assistant professor

Department of Experimental Medicine (DIMES), Biochemistry, University of Genova

TEACHING ACTIVITIES:

[aa 2017-2022](#)

supporting biochemistry practical course in bachelor's degree in Biotechnology,
University of Genova

[aa 2022-2023 and aa 2023-2024](#)

teaching in "Biochemistry and Laboratory" in bachelor's degree in biotechnology,
University of Genova

[aa 2024-2025](#)

teaching in "Biochemistry and Laboratory" in bachelor's degree in biotechnology and "Human
Biochemistry and Diagnostic biotechnology" in master's degree in Biotechnology,
University of Genova

[aa 2023-2024](#)

teaching activity in Experimental Medicine PhD courses, "Approaches to study metabolism in
in vivo and *ex vivo* animal models",
University of Genova

[aa 2019-2020](#)

co-organizer of the practical course "NAD biochemistry in cancer cells", for PhD involved in
"ITN INTEGRATA" European project, (INTEGRATA First Short Scientific Course, Organized by Prof.
Santina Bruzzone),
University of Genova

[Since aa 2020-2021](#)

collaborating in departmental activities focused on scientific dissemination to high school
students,
University of Genova

EXPERIENCE

MAIN SEMINARS

[15/12/2023](#)

The TRPM2 ion channel regulates metabolic and thermogenic adaptations in adipose tissue of cold-
exposed mice.

Ludwig-Maximilians-University Munich (LMU), Walther Straub Institute of Pharmacology and
Toxicology, Munich (Germany).

[24/05/2024](#)

Therapeutic potential of targeting the NAD world.

Istituto Giannina Gaslini (Genova).

SCIENTIFIC RESPONSIBILITY FOR RESEARCH PROJECTS ACCEPTED FOR FUNDING ON THE BASIS OF
COMPETITIVE CALLS INVOLVING PEER REVIEW

[2018-2019](#). SIRT6 inhibition as a therapeutic approach for treating multiple sclerosis.

PI Prof Bruzzone (University of Genova);

FISM (Federazione Italiana Sclerosi Multipla)

[2018-2020](#). Extracellular ATP and T regulatory cells: new therapeutics targets in alpha-
sarcoglycan deficient muscular dystrophy (LGMD2D).

PI Dott Bruno (IRCCS Gaslini), Prof Bruzzone (University of Genova) collaborator;
Telethon (progetto GGP17192)

2019-2022. Characterization of the hematopoietic niche under physiological and stress conditions by the use of microfluidic bioreactors and engineered red blood cells.

Coordinator Prof Magnani (University of Urbino), Prof Bruzzone (University of Genova) PI unit of Genova;

MIUR-PRIN (PRIN2017Z5LR5Z_003)

2020-2022. Il ruolo e la modulazione dell'infiammazione nelle distrofie muscolari pediatriche: nuove prospettive terapeutiche.

PI Prof Bruzzone (University of Genova);

Fondazione Compagnia di San Paolo

2021-2023. Lead optimization of MKT-077 analogues as HSP70 allosteric inhibitors combined with F508del CFTR correctors: a multi-drug approach to contrast cystic fibrosis.

PI Prof Millo (University of Genova), Prof Bruzzone (University of Genova) collaborator;

Fondazione Italiana Fibrosi Cistica

2022-2024. Dissecting hypoxia-induced metabolism to advance ex vivo manipulation of Hematopoietic Stem Cells.

PI Prof Bruzzone (University of Genova);

Fondazione Compagnia di San Paolo (Bando Trapezio)

2023-2025. Harnessing the Sirtuin 6-Thyroid Hormone cross talk to counteract the progression of the Duchenne Muscular Dystrophy.

PI Prof Monica Dentice (University Federico II Napoli) Prof Bruzzone (University of Genova) collaborator;

Telethon (GMR22T1020)

2023-2025. Genomic, proteomic and metabolomic characterization of hypoxia-dependent Hematopoietic Stem Cells to improve their harvesting and downstream applications.

Coordinator Prof Balduini (University of Pavia), Prof Bruzzone (University of Genova) PI unit of Genova;

MIUR-PRIN (2022P9RM9M)

2018-2022. INTEGRATA

PI at UNIGE, Prof. Bruzzone;

Marie Skłodowska-Curie ITN European Training Network

2022-2026. NADIS

PI at UNIGE, Prof. Bruzzone;

Marie Skłodowska-Curie HORIZON-MSCA-DN-2021

TEACHING OR RESEARCH POSITIONS (FELLOWSHIPS) AT FOREIGN UNIVERSITIES AND RESEARCH INSTITUTES

17/08/2021-19/11/2021 Erasmus+ fellowship

Research activity in Prof J. Heeren's lab, biochemistry and molecular biology department; University Medical Center Hamburg-Eppendorf, Amburg, Germany

16/11/2023-16/01/2024 SIB (Società Italiana di Biochimica) fellowship

Research activity in Prof A. Nicke's lab, Ludwig-Maximilians-University Munich (LMU), Walther Straub Institute of Pharmacology and Toxicology; Maximilians-University Munich, Munich, Germany

GRANTS

[17/08/2021-19/11/2021](#) Erasmus+ Fellowship

University Medical Center Hamburg-Eppendorf, Hamburg (Germany)

[16/11/2023-16/01/2024](#) SIB grant for abroad research periods

Ludwig-Maximilians-University Munich (LMU), Walther Straub Institute of Pharmacology and Toxicology, Munich (Germany)

[29/06/2024-03/07/2024](#) FEBS YSF grant

participation to "2024 FEBS Young Scientists' Forum (YSF)", Pavia, Italy (26-29th June 2024) and to the 48^o congress FEBS, Milano, Italy (29-3rd July 2024)

EDITORSHIP OR PARTICIPATION IN EDITORIAL BOARDS OF JOURNALS, PUBLISHING SERIES, ENCYCLOPAEDIAS AND TREATISES

2023. Co-guest editor

Special Issue: "The Role of NAD⁺ Metabolism in Cellular Processes during Aging and Age-Associated Diseases";

journal "Cells" of MDPI

PARTICIPATION TO NATIONAL AND INTERNATIONAL CONGRESSES

Carbohydrate Chemistry (XVI CSCC 2018), Certosa di Pontignano, Siena, Italy, [17-20th June 2018](#).

Poster: The 6-deoxy hexoses metabolism in trichomonas vaginalis. Gaglianone M, Laugieri ME, **Benzi A**, Tonetti M.

Annual Meeting of the Italian Multiple Sclerosis Society, Roma, Italy, [29-31th May 2019](#). **Poster:** SIRT6 inhibition as a therapeutic approach for treating multiple sclerosis. Ferrara G, Frumento D, **Benzi A**, Scaroni F, Petrosino V, Sturla L, Verderio C, Kerlero de Rosbo N, Uccelli A, Bruzzone S.

FASEB Summer Conference "The NAD Metabolism and Signalling Conference", Dublino, Ireland, [23-28th June 2019](#). **Poster and oral presentation:** Role of CD38 in cold-induced thermogenesis. **Benzi A**, Heine M, Fischer A, Sturla L, Koch-Nolte F, Mittrücker H-W, Guse AH, Zocchi E, Heeren J, Bruzzone S.

XX Telethon Convention. Riva del Garda, [28-30th October 2019](#). **Poster:** The pharmacological inhibition of P2X7 purinergic receptor as a novel therapeutic strategy in alpha-sarcoglycan deficient muscular dystrophy (LGMD2D). Baratto S, Principi E, Del Zotto G, Antonini F, Panicucci C, Ognio E, **Benzi A**, Bruzzone S, Gazzero E, Minetti C, Raffaghello L, Bruno C.

BraYn, Milano, Italy, [14-16th November 2019](#). **Poster:** SIRT6 inhibition as a therapeutic approach in multiple sclerosis. **Benzi A**, Ferrara G, Frumento D, Spinelli S, Scaroni F, Petrosino V, Sturla L, Verderio C, Kerlero de Rosbo N, Uccelli A, Bruzzone S.

The 45th FEBS (Federation of the European Biochemical Societies) Congresso virtuale, [3-8th July 2021](#). **Poster:** Role of CD38 during thermogenesis in adipose tissues and liver. **Benzi A**, Spinelli S, Heine M, Fischer A, Abbotto E, Sturla L, Koch-Nolte F, Mittrücker H-W, Guse AH, De Flora A, Zocchi E, Heeren J, Bruzzone S.

FASEB Summer Conference “The NAD Metabolism and Signalling Conference”, Online meeting, [15-16th June 2021](#). **Poster:** Role of CD38 during thermogenesis in adipose tissues and liver. **Benzi A**, Spinelli S, Heine M, Fischer A, Abboto E, Sturla L, Koch-Nolte F, Mittrücker H-W, Guse AH, De Flora A, Zocchi E, Heeren J, Bruzzone S.

Congresso Nazionale Società Italiana Biochimica e Biologia molecolare (SIB), Online meeting, [23-24th September 2021](#). **Poster:** Role of CD38 during thermogenesis in adipose tissues and liver. **Benzi A**, Spinelli S, Heine M, Fischer A, Abboto E, Sturla L, Koch-Nolte F, Mittrücker H-W, Guse AH, De Flora A, Zocchi E, Heeren J, Bruzzone S.

FASEB “The NAD⁺ Metabolism and Signaling Conference”, Steamboat Springs, Colorado (USA), [26-30th June 2022](#). **Poster:** Extracellular nicotinamide adenine dinucleotide (NAD) arrests endothelial cell proliferation. Astigiano C, Piacente F, Laugieri ME, **Benzi A**, Soncini D, Cea M, Di Buduo C, Antonelli A, Balduini A, Magnani M, Bruzzone S.
Abstract: The role of CD38 and TRPM2 in adipose tissue and liver during thermogenesis. **Benzi A**, Sturla L, Heine M, Spinelli S, Koch-Nolte F, Mittrücker H-W, Guse AH, De Flora A, Zocchi E, Heeren J, Bruzzone S.

BraYn, Roma, Italy, [28-30th September 2022](#). **Poster:** Iron-fed microglia: an in vitro system to model microglial phenotype in vitro and test new therapy in neurodegenerative diseases? Cutugno G, Lombardo MT, Scali V, Golia MT, Lombardi M, **Benzi A**, Astigiano C, Denti V, Paglia G, Bruzzone S, Verderio C.

XXIII national congress of Associazione Italiana Miologia (AIM), Padova, Italy, [8-10th June 2023](#). **Oral presentation:** The role of the NAD⁺/CD38 axis in the pathophysiology of a-sarcoglycanopathy. **Benzi A**, Amaro A, Pintus S, Antonini F, Reggiani F, Baratto S, Principi E, Del Zotto G, Cassandrini D, D’Amico A, Malandrini A, Malfatti E, Mongini T, Pegoraro E, Previtali S, Rodolico C, Tasca G, Morandi F, Malavasi F, Pfeffer U, Bruzzone S, Bruno C, Raffaghello L.

62° SIB Congress, Firenze, Italy, [7-9th September 2023](#). **Posters:**

1. TRPM2 is fundamental for adipose tissue and liver thermogenic response promotion during cold exposure. **Benzi A**, Heine M, Spinelli S, Salis A, Memushaj A, Sturla L, Damonte G, Fischer AW, Koch-Nolte F, Mittrücker H-W, Guse AH, De Flora A, Heeren J, Bruzzone S.

2. Sirtuin 6 Regulates the Activation of the ATP/Purinergic Axis in Endothelial Cells. Astigiano C, Piacente F, Laugieri ME, **Benzi A**, Di Buduo CA, Miguel CP, Soncini D, Cea M, Antonelli A, Magnani M, Balduini A, De Flora A, Bruzzone S.

3. Boosting NAD in senescent microglia to fight neurodegeneration? Astigiano C, Cutugno G, Golia MT, Lombardo MT, Roncella G, **Benzi A**, Bruzzone S, Verderio C.

Nordic Obesity Meeting 2024. Helsinki (Finland), [1-3rd February 2024](#). **Poster:** The TRPM2 ion channel regulates metabolic and thermogenic adaptations in adipose tissue of cold-exposed mice. **Benzi A**, Heine M, Spinelli S, Salis A, Worthmann A, Diercks B, Astigiano C, Pérez Mato R, Memushaj A, Sturla L, Vellone V, Damonte G, Jaeckstein MY, Koch-Nolte F, Mittrücker H-W, Guse AH, De Flora A, Heeren J, Bruzzone S.

2024 FEBS Young Scientists' Forum (YSF), Pavia, Italy, [26-29th June 2024](#). **Poster:** The role of the NAD-related pathways in the pathophysiology of alfa-sarcoglycanopathy. **Benzi A**, Amaro A, Pintus S, Antonini F, Reggiani F, Baratto S, Principi E, Del Zotto G, Cassandrini D, D’Amico A, Malandrini A, Malfatti E, Mongini T, Pegoraro E, Previtali S, Rodolico C, Tasca G, Morandi F, Malavasi F, Pfeffer U, Bruzzone S, Bruno C, Raffaghello L.

48° congresso FEBS (Federation of the European Biochemical Societies), Milano, Italy, 29-3rd July 2024. **Posters:**

1. The role of the NAD-related pathways in the pathophysiology of alfa-sarcoglycanopathy. **Benzi A**, Amaro A, Pintus S, Antonini F, Reggiani F, Baratto S, Principi E, Del Zotto G, Cassandrini D, D'Amico A, Malandrini A, Malfatti E, Mongini T, Pegoraro E, Previtali S, Rodolico C, Tasca G, Morandi F, Malavasi F, Pfeffer U, Bruzzone S, Bruno C, Raffaghello L.
2. Boosting NAD in senescent microglia, a useful strategy to counteract neurodegeneration? Astigiano C, Cutugno G, Golia MT, Lombardo MT, Roncella G, **Benzi A**, Bruzzone S, Verderio C.

FASEB "The NAD⁺ Metabolism and Signaling Conference", Lisbona (Portogallo), 25-29th August 2024. **Presentazione orale:** The role of the NAD⁺/CD38 axis in the pathophysiology of a-sarcoglycanopathy. **Benzi A**, Amaro A, Pintus S, Antonini F, Reggiani F, Baratto S, Principi E, Del Zotto G, Cassandrini D, D'Amico A, Malandrini A, Malfatti E, Mongini T, Pegoraro E, Previtali S, Rodolico C, Tasca G, Morandi F, Malavasi F, Pfeffer U, Bruzzone S, Bruno C, Raffaghello L.

Posters:

1. The role of the NAD-related pathways in the pathophysiology of alfa-sarcoglycanopathy. **Benzi A**, Amaro A, Pintus S, Antonini F, Reggiani F, Baratto S, Principi E, Del Zotto G, Cassandrini D, D'Amico A, Malandrini A, Malfatti E, Mongini T, Pegoraro E, Previtali S, Rodolico C, Tasca G, Morandi F, Malavasi F, Pfeffer U, Bruzzone S, Bruno C, Raffaghello L.
2. NAD modulation as a possible strategy to improve HSPC preservation. **Benzi A**, Caragata A, Calleda FR, Biancucci F, Raggi F, Piacente F, Astigiano C, Menotta M, Di Buduo C, Bosco MC, Magnani M, Bianchi M, Balduini A, Bruzzone S, Malara A.
3. The TRPM2 ion channel regulates the browning process in human adipose tissue. Mato RP, **Benzi A**, U-Din M, Spinelli S, Brochard T, Piacente F, Astigiano C, Hansen JB, Sturla L, Virtanen KA, Pirinen E, Bruzzone S.

Meeting "CD38 e nuovi possibili bersagli nel mieloma multiplo" San Benedetto del Po (MN), Italy, 11-12th October 2024. Involvement in results showed by M. Cea, title: "NAD metabolism dysregulation drives myeloma aggressiveness".

PUBLICATIONS:

Co-author of 19 **publications** on International Journals (5 as 1° author and 1 as corresponding author). H-index: 9

ARTICLES:

1. Sociali G, Liessi N, Grozio A, Caffa I, Parenti MD, Ravera S, Tasso B, **Benzi A**, Nencioni A, Del Rio A, Robina I, Millo E, Bruzzone S. Differential modulation of SIRT6 deacetylase and deacylase activities by lysine-based small molecules. *Mol Divers*. 2020; 24:655-671.
2. Ferrara G, **Benzi A***, Sturla L, Marubbi D, Frumento D, Spinelli S, Abbotto E, Ivaldi F, von Holtey M, Murone M, Nencioni A, Uccelli A, Bruzzone S. Sirt6 inhibition delays the onset of experimental autoimmune encephalomyelitis by reducing dendritic cell migration. *J Neuroinflammation*. 2020;17:228. *co-first author
3. **Benzi A**, Sturla L, Heine M, Fischer AW, Spinelli S, Magnone M, Sociali G, Parodi A, Fenoglio D, Emionite L, Koch-Nolte F, Mittrücker HW, Guse AH, De Flora A, Zocchi E, Heeren J, Bruzzone S. CD38 downregulation modulates NAD⁺ and NADP(H) levels in thermogenic adipose tissues. *Biochim Biophys Acta Mol Cell Biol Lipids*. 2021;1866:158819.
4. Becherini P, Caffa I, Piacente F, Damonte P, Vellone VG, Passalacqua M, **Benzi A**, Bonfiglio T, Reverberi D, Khalifa A, Ghanem M, Guijarro A, Tagliafico L, Sucameli M, Persia A, Monacelli F,

- Cea M, Bruzzone S, Ravera S, Nencioni A. SIRT6 enhances oxidative phosphorylation in breast cancer and promotes mammary tumorigenesis in mice. *Cancer Metab.* 2021;9:6.
5. **Benzi A**, Grozio A, Spinelli S, Sturla L, Guse AH, De Flora A, Zocchi E, Heeren J, Bruzzone S. Role of CD38 in Adipose Tissue: Tuning Coenzyme Availability? *Nutrients.* 2021;13:3734.
 6. Raffaghello L, Principi E, Baratto S, Panicucci C, Pintus S, Antonini F, Del Zotto G, **Benzi A**, Bruzzone S, Scudieri P, Minetti C, Gazzero E, Bruno C. P2X7 Receptor Antagonist Reduces Fibrosis and Inflammation in a Mouse Model of Alpha-Sarcoglycan Muscular Dystrophy. *Pharmaceuticals (Basel).* 2022;15:89.
 7. Piacente F, Bottero M, **Benzi A**, Vigo T, Uccelli A, Bruzzone S, Ferrara G. Neuroprotective Potential of Dendritic Cells and Sirtuins in Multiple Sclerosis. *Int J Mol Sci.* 2022;23:4352.
 8. Franco J, Piacente F, Walter M, Fratta S, Ghanem M, **Benzi A**, Caffa I, Kurkin AV, Altieri A, Herr P, Martínez-Bailén M, Robina I, Bruzzone S, Nencioni A, Del Rio A. Structure-Based Identification and Biological Characterization of New NAPRT Inhibitors. *Pharmaceuticals (Basel).* 2022;15:855.
 9. Astigiano C, **Benzi A**, Laugieri ME, Piacente F, Sturla L, Guida L, Bruzzone S, De Flora A. Paracrine ADP Ribosyl Cyclase-Mediated Regulation of Biological Processes. *Cells.* 2022;11:2637.
 10. Spinelli S, Guida L, Vigliarolo T, Passalacqua M, Begani G, Magnone M, Sturla L, **Benzi A**, Ameri P, Lazzarini E, Bearzi C, Rizzi R, Zocchi E. The ABA-LANCL1/2 Hormone-Receptors System Protects H9c2 Cardiomyocytes from Hypoxia-Induced Mitochondrial Injury via an AMPK- and NO-Mediated Mechanism. *Cells.* 2022;11:2888.
 11. **Benzi A**, Baratto S, Astigiano C, Sturla L, Panicucci C, Mamchaoui K, Raffaghello L, Bruzzone S, Gazzero E, and Bruno C. Aberrant ATP release and impairment of P2Y2-mediated signaling in sarcoglycanopathies. *Lab Invest.* 2023;103:100037.
 12. Astigiano C, Piacente F, Laugieri ME, **Benzi A**, Di Buduo CA, Miguel CP, Soncini D, Cea M, Antonelli A, Magnani M, Balduini A, De Flora A, Bruzzone S. Sirtuin 6 Regulates the Activation of the ATP/Purinergic Axis in Endothelial Cells. *Int J Mol Sci.* 2023;24:6759.
 13. **Benzi A**, Spinelli S, Sturla L, Heine M, Fischer AW, Koch-Nolte F, Mittrücker HW, Guse AH, De Flora A, Heeren J, Bruzzone S. Role of liver CD38 in the regulation of metabolic pathways during cold-induced thermogenesis in mice. *Cells.* 2022;11:3812.
 14. Becherini P, Soncini D, Ravera S, Gelli E, Martinuzzi C, Giorgetti G, Cagnetta A, Guolo F, Ivaldi F, Miglino M, Aquino S, Todoerti K, Neri A, **Benzi A**, Passalacqua M, Nencioni A, Perrotta I, Gallo Cantafio ME, Amodio N, De Flora A, Bruzzone S, Lemoli RM, Cea M. CD38-Induced Metabolic Dysfunction Primes Multiple Myeloma Cells for NAD⁺-Lowering Agents. *Antioxidants (Basel).* 2023;12:494.
 15. Conforti I, **Benzi A**, Caffa I, Bruzzone S, Nencioni A, Marra A. Iminosugar-Based Nicotinamide Phosphoribosyltransferase (NAMPT) Inhibitors as Potential Anti-Pancreatic Cancer Agents. *Pharmaceutics.* 2023;15:1472.
 16. Garbarino O, Valenti GE, Monteleone L, Pietra G, Mingari MC, **Benzi A**, Bruzzone S, Ravera S, Leardi R, Farinini E, Vernazza S, Grottoli M, Marengo B, Domenicotti C. PLX4032 resistance of patient-derived melanoma cells: crucial role of oxidative metabolism. *Front Oncol.* 2023;13:1210130.
 17. **Benzi A***, Heine M, Spinelli S, Salis A, Worthmann A, Diercks B, Astigiano C, Mato RP, Memushaj A, Sturla L, Vellone V, Damonte G, Jaeckstein MY, Koch-Nolte F, Mittrücker HW, Guse AH, De Flora A, Heeren J, Bruzzone S. The TRPM2 ion channel regulates metabolic and thermogenic adaptations in adipose tissue of cold-exposed mice. *Front in Endocrinology.* 2024;14:1251351; *first and corresponding author
 18. Conforti I, **Benzi A**, Caffa I, Bruzzone S, Nencioni A and Marra A. New Analogues of the Nicotinamide Phosphoribosyltransferase Inhibitor FK866 as Potential Anti-Pancreatic Cancer Agents. *Med Chem.* 2024;20:694-708.
 19. Cea M, Giorgetti G, Maroto-Martin E, Soncini D, Fenoglio D, Becherini P, **Benzi A**, Rivoli G, Truffelli D, Ladisa F, Traverso I, Lai F, Nahimana A, Cagnetta A, Guolo F, Uras CRM,

Schavgoulidze A, Fong Ng J, Nencioni A, Bruzzone S, Munshi N, Lemoli R, Fulciniti M and Ravera S. CD56 expression modulates NAD⁺ metabolic landscape and predicts sensitivity to anti-CD38 therapies in multiple myeloma. *Blood Cancer J.* 2025;15:83.