INFORMAZIONI PERSONALI

Bruno Grassi

Affiliazione:
Università di Udine
Dipartimento di Area Medica
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Sesso Maschio | Data di nascita 06/01/1958 | Nazionalità Italiana

CARRIERA ACCADEMICA

Date (da - a)

Posizioni occupate:

1987	Borsa di Avviamento alla Ricerca, Istituto Scientifico Ospedale San Raffaele, Milano
1991–2001	Ricercatore, Istituto di Tecnologie Biomediche Avanzate, Consiglio Nazionale delle Ricerche, Milano.
2001–2007	Professore Associato di Fisiologia, Facoltà di Medicina e Chirurgia, Università di Milano.
2007–2010	Professore Associato di Fisiologia, Facoltà di Medicina e Chirurgia, Università di Udine.
Dal 2010	Professore Ordinario di Fisiologia, Dipartimento di Medicina, Università di Udine.

Altre posizioni occupate:

2012-2017	Coordinatore, Corso di Laurea Triennale in Scienze Motorie, Università di Udine.
2013-2017	Coordinatore, Corso di Laurea Magistrale in Scienze dello Sport, Università di Udine.
Dal 2014	Direttore, Laboratorio Fisiologia dell'Esercizio, Dipartimento Medicina, Università di Udine.
Dal 2017	Coordinatore, Coordinatore, Corso di Laurea in Medicina e Chirurgia, Università di Udine.
Dal 2022	Direttore, Scuola di Specializzazione in Medicina dello Sport e dell'Esercizio, Università di Udine.

Periodi di lavoro trascorsi all'estero:

1992 *Research Assistant*, Dept. Physiologie, Universitè de Genève, Geneva (Switzerland) - (Prof. Paolo Cerretelli).

1993-1994 *Visiting Scientist*, Division of Physiology, Department of Medicine, University of California at San Diego, La Jolla, CA (USA) – (Prof. Peter D. Wagner).

1996-1997 *Postgraduate Researcher*, Division of Physiology, Department of Medicine, University of California at San Diego, La Jolla, CA (USA) – (Prof. Peter D. Wagner).

1998, 1999, 2000, 2001, 2002, 2004, 2005, 2009, 2016 *Visiting Scientist*, Dept. Health and Human Performance, Auburn University, Auburn, AL (USA) (Prof. L.B. Gladden).

2015, *Visiting Professor*, Universidade Federal de Santa Catarina, Florianopolis, Santa Catarina, Brasil.

2022, *Visiting Professor*, Faculty Health Sciences, Jagiellonian University Medical College, Krakow, Poland.

EDUCAZIONE

Date (da - a)

1984 Laurea in Medicina e Chirurgia, Università di Milano.
1987 Scuola di Specializzazione in Medicina dello Sport, Università di Milano.
1992 Dottorato di Ricerca in Fisiologia, Università di Milano (Supervisore Prof. Paolo Cerretelli).

Replace with EQF (or other) level if relevant

PARTECIPAZIONE A SPEDIZIONI SCIENTIFICHE

1987, 1988 Siracusa: Adattamenti fisiologici in apneisti di elite.
1989 Bipindi (Camerun): Energetica della locomozione in pigmei africani.
1990, 1991 Spedizioni Scientifiche Ev-K2-CNR, "Laboratorio Piramide" Laboratory, Lobuche, Khumbu (Nepal): Metabolismo energetico aerobico e anaerobico in alta quota
2007, 2008 Orthopedic Hospital, Valdoltra (Slovenia): Adattamenti fisiologici alla microgravità simulata (bed rest). Italian Space Agency (ASI) Project OSMA (Osteoporosis and Muscular Atrophy) - ASI-OSMA.
2012, 2013 Planica Sports Center, Ratece (Slovenia): Adattamenti fisiologici alla microgravità simulate e/o all'ipossia. Research Project: "Planetary Habitat Simulation – PlanHab". (VII Framework Programme, European Community, Bruxelles).
2012 Orthopedic Hospital, Valdoltra (Slovenia): Adattamenti fisiologici alla microgravità simulata (bed rest) nell'anziano. Research Project: Physical activity and nutrition for quality ageing (PANGeA). Interreg-EU Projects.
2019 Bolnišnica Hospital, Izola (Slovenia): Effetti della microgravità simulata (bed rest) sul metabolism energetico ossidativo. Research Project: "Marcatori biologici e funzionali per la biomedicine astronautica di precisione. MARS-PRE". Italian Space Agency (Agenzia Spaziale Italiana, ASI).

HONORS:

Dal 2016 Fellow, American College of Sports Medicine (FACSM)
Dal 2021 Fellow, American Physiological Society (FAPS)

ATTIVITA' EDITORIALE:

Comitati Editoriali:

Journal of Physiology (Reviewing Editor)
Medicine and Science in Sports and Exercise (Associate Editor)

***Referee*:**

Journal of Applied Physiology, American Journal of Physiology (Heart and Circulatory Physiology); American Journal of Physiology (Regulatory, Integrative and Comparative Physiology); European Journal of Applied Physiology; Journal of Biomedical Optics; Experimental Physiology; Sports Medicine; Respiratory Physiology and Neurobiology; Circulation; Clinical Physiology and Functional Imaging; Acta Physiologica Scandinavica; Comprehensive Physiology; High Altitude Medicine and Biology; Scientific Reports.

FINANZIAMENTI RICEVUTI

1998-2001. *Project Coordinator*. Collaborative Research Grant no. 972111, N.A.T.O., Bruxelles. Research Project: "Factors limiting muscle O_2 uptake on-kinetics". Funding: 5500 €.

1999-2001. *Principal Investigator*. Telethon Research Grant no. 1161 C: "$\dot{V}O_2$ kinetics for functional evaluation of myopathy patients", Telethon Foundation, Italy. Funding: 66.000 €.

2001-2005. *Scientific Coordinator of a Research Unit*. Research Project: "Physical frailty and loss of functional independence in old age: determinants and adaptations to physical activity". EC Contract n. QLK6-CT-2001-00323, V Framework Programme, European Community, Bruxelles. Total funding: 1.602.561 €. Funding for the Research Unit: 186720 €.

2002-2005. *Project Coordinator*. Collaborative Linkage Grant no. LST.CLG.979220, N.A.T.O., Bruxelles. Research Project: "Skeletal muscle $\dot{V}O_2$ kinetics: from basic physiology

to exercise performance". Funding: 19200 €.

2004-2006. *Principal Investigator*. Telethon – UILDM Project (GUP030534), Italy. "New tools of functional evaluation of patients with metabolic myopathies". Funding: 73975 €.

2006-2008. *Principal Investigator WorkPackage 1B32.* Italian Space Agency (ASI) Project OSMA (Osteoporosis and Muscular Atrophy) - ASI-OSMA Contract I/007/06/0. "Functional evaluation of skeletal muscle oxidative metabolism in microgravity-induced muscular atrophy". Funding: 140000 €.

2009-2011. *Coordinator.* Telethon – UILDM Project (GUP08007), Italy. "New methods of functional evaluation of patients with metabolic myopathies. The effects of exercise training". Funding: 117800 €.

2011-2014. *Participant to a Research Unit.* Research Project: Physical activity and nutrition for quality ageing (PANGeA). Interreg-EU Projects. Total funding: 1253000 €. Funding for the Research Unit: 139000 €.

2012-2014. *Scientific Coordinator of a Research Unit.* Research Project: "Planetary Habitat Simulation – PlanHab". (EC Contract n. 284438, VII Framework Programme, European Community, Bruxelles; FP7-SPACE-2011-1. Total funding: 1878973 €. Funding for the Research Unit: 203064 €.

2013-2016. *Scientific Coordinator of the Italian Partners of the Project.* Ministry for University and Research, Warsaw, Poland. Research Project: "The effect of endurance training on skeletal muscle adaptive responses in transgenic mice (Tgαq*44) with dilated cardiomyopathy". Funding for the Research Unit: 79000 €.

2013-2017. *Participant to a Research Unit.* Ministry of Health, Italy. Progetti di Ricerca Finalizzata - Young Researchers, no. GR-2011-02348868. Research Project: "Exercise tolerance in patients with late-onset Pompe disease on enzyme replacement therapy: effects of exercise training and hyperproteic diet." Funding for the Research Unit: 35600 €.

2019-2022. *Coordinator of a Research Unit*. PRIN Project (Italian Ministry of University and Research) 2017CBF8NJ, "Neuromuscular ageing: mechanisms and functional implications – NeuAge)". Total funding: 816860 €. Funding for the Research Unit: 108120 €.

2019-2022. *Coordinator of a Research Unit.* Research Project: "Marcatori biologici e funzionali per la biomedicine astronautica di precisione. MARS-PRE". Italian Space Agency (Agenzia Spaziale Italiana, ASI; Bando ASI DC-VUM-2017-006, Biomedicina). Total funding: 1496000 €. Funding for the Research Unit: 80000 € .

2022-2025. *Coordinator of a Research Unit*. PRIN 2020 Project (Italian Ministry of University and Research) 2020EM9A8X, "Inactivity-induced neuromuscular impairment through different ages: from children, to young and middle age adults [InactivAge])". Total obtained funding: 756931 €. Obtained funding for the Research Unit: 189688 €.

IMPORTO TOTALE FINANZIAMENTI RICEVUTI: circa 1.500.000 €.

CAMPI GENERALI DI RICERCA

Campi generali di interesse:
Fisiologia dell'esercizio e degli adattamenti all'ambiente; bioenergetica muscolare; fisiologia clinica.

Campi di interesse specifici:
- Skeletal muscle oxidative metabolism during exercise; mechanisms of regulation; effects of training, inactivity, hypoxia, aging, pathological conditions.
- Functional evaluation of oxidative metabolism during exercise in humans, with specific reference to skeletal muscle: oxygen uptake kinetics, near-infrared spectroscopy, mitochondrial respiration by high-resolution respirometry in permeabilized skeletal muscle fibers; vascular peripheral and microvascular function.
- Physiological adjustments to exercise and functional evaluation of skeletal muscle oxidative metabolism in elderly, heart transplant recipients, patients with chronic heart failure, transgenic mice models of cardiomyopathy, patients with metabolic myopathies, obese patients. Effects of training and other interventions.
- Effects of simulated microgravity and inactivity (bed rest) on skeletal muscle oxidative

metabolism; effects of microgravity associated with hypoxia.
- Physiological adjustments and adaptations to exercise in chronic hypobaric hypoxia.

PUBBLICAZIONI

151 pubblicazioni su riviste scientifiche internazionali con comitato di referees.
Google Scholar: Marzo 2023, H-index = 55, numero totale di citazioni = 9802; Scopus: Novembre 2022: H-index 43, numero totale di citazioni = 6469.
32 capitoli di libri; 69 invited lectures; 189 comunicazioni a congressi.

SELEZIONE DI RECENTI PUBBLICAZIONI:

Porcelli S., M. Marzorati, F. Lanfranconi, P. Vago, R. Pišot, **B. Grassi**. Role of skeletal muscle impairment and brain oxygenation in limiting oxidative metabolism during exercise after bed rest. *J. Appl. Physiol.* 109: 101-111, 2010.

Grassi B., H.B. Rossiter, M.C. Hogan, R.A. Howlett, J.E. Harris, M.L. Goodwin, J.L. Dobson, L.B. Gladden. Faster O_2 uptake kinetics in canine skeletal muscle *in situ* after acute creatine kinase inhibition. *J. Physiol.* 589: 221-233, 2011.

Jones A.M., **B. Grassi**, P.M. Christensen, P. Krustrup, J. Bangsbo, D.C. Poole. The slow component of $V'O_2$ kinetics: mechanistic bases and practical applications. *Med. Sci. Sports Exerc.* 43: 2046-2062, 2011.

Salvadego D., S. Lazzer, M. Marzorati, S. Porcelli, E. Rejc, B. Šimunic, R. Pišot, P.E. di Prampero, **B. Grassi**. Functional impairment of skeletal muscle oxidative metabolism during knee-extension exercise after bed rest. *J. Appl. Physiol.* 111: 1719-1726, 2011.

Rejc E., P.E. di Prampero, S. Lazzer, **B. Grassi**, B. Šimunic, R. Pišot, G. Antonutto, M. Narici. Maximal explosive power of the lower limbs before and after 35 days of bed rest under different diet energy intake. *Eur. J. Appl. Physiol.* 115: 429-436, 2015.

Cannavino J., L. Brocca, M. Sandri, **B. Grassi**, R. Bottinelli, M.A. Pellegrino. The role of alterations in mitochondrial dynamics and PCG-1α over-expression in fast muscle atrophy following hindlimb unloading. *J. Physiol.* 593: 1981-1995, 2015.

Grassi B., H.B. Rossiter, J.A. Zoladz. Skeletal muscle fatigue and decreased efficiency: two sides of the same coin? *Exerc. Sport Science Rev.* 43: 75-83, 2015.

Pišot R., U. Marusic, G. Biolo, S. Mazzucco, S. Lazzer, **B. Grassi**, C. Reggiani, L. Toniolo, P.E. di Prampero, A. Passaro, M. Narici, S. Mohammed, J. Rittweger, M. Gasparini, M. Gabrijelčič Blenkuš, B. Šimunič. Greater loss in muscle mass and function but smaller metabolic alterations in older compared to younger men following two weeks of bed rest and recovery. *J. Appl. Physiol.* 120: 922-929, 2016.

Salvadego D., M.E. Keramidas, L. Brocca, R. Domenis, I. Mavelli, J. Rittweger, O. Eiken, I.B. Mekjavic, **B. Grassi.** Separate and combined effects of a 10-d exposure to hypoxia and inactivity on oxidative function *in vivo* and mitochondrial respiration *ex vivo* in humans. *J. Appl. Physiol.* 121: 154-163, 2016.

Grassi B., V. Quaresima. Near-infrared spectroscopy and skeletal muscle oxidative function *in vivo* in health and disease: a review from an exercise physiology perspective. *J. Biomed. Optics* 21 (9), 091313, 2016.

Porcelli S., M. Marzorati, L. Morandi, **B. Grassi**. Home-based aerobic exercise training improves skeletal muscle oxidative metabolism in patients with metabolic myopathies. *J. Appl. Physiol.* 121: 699-708, 2016.

Biolo G., R. Pišot, S. Mazzucco, F.G. Di Girolamo, R. Situlin, S. Lazzer, **B. Grassi**, C. Reggiani, A. Passaro, J. Rittweger, M. Gasparini, B. Šimunič, M. Narici. Anabolic resistance assessed by oral stable isotope ingestion following bed rest in young and older adult volunteers: relationship with changes in muscle mass. *Clin. Nutr.* 36: 1420-1426, 2017.

Grassi B., J. Majerczak, E. Bardi, A. Buso, M. Comelli, S. Chlopicki, M. Guzik, I. Mavelli, Z. Nieckarz, D. Salvadego, U. Tyrankiewicz, T. Skórka, R. Bottinelli, J.A. Zoladz, M.A. Pellegrino. Exercise training in Tgα_q*44 mice during the progression of chronic heart failure: cardiac *vs.* peripheral (soleus muscle) impairments to oxidative metabolism. *J. Appl. Physiol.* 123: 326-336, 2017.

Salvadego D., M.E. Keramidas, R. Kölegård, L. Brocca, S. Lazzer, I. Mavelli, J. Rittweger, O. Eiken, I.B. Mekjavic, **B. Grassi.** PlanHab*: hypoxia does not worsen the impairment of skeletal muscle oxidative function induced by bed rest alone. *J. Physiol.* 596: 3341-3355, 2018.

Zuccarelli L., S. Porcelli, L. Rasica, M. Marzorati, **B. Grassi.** Comparisons between slow components of HR and $V'O_2$ kinetics: functional significance. *Med. Sci. Sports Exerc.* 50: 1649-1657, 2018.

Grassi B., S. Porcelli, M. Marzorati. Translational medicine: exercise physiology applied to metabolic myopathies. *Med. Sci. Sports Exerc.* 51: 2183-2192, 2019.

Zuccarelli L., P.C. Do Nascimento Salvador, A. Del Torto, R. Fiorentino, **B. Grassi**. Skeletal muscle $V'O_2$ kinetics by the NIRS repeated occlusions method during the recovery from cycle ergometry exercise. *J. Appl. Physiol.* 128: 534-540, 2020.

Narici M., G. De Vito, M. Franchi, A. Paoli, T. Moro, G. Marcolin, **B. Grassi**, G. Baldassarre, L. Zuccarelli, G. Biolo, F.G. di Girolamo, N. Fiotti, F. Dela, P. Greenhaff, C. Maganaris. Impact of sedentarism due to the COVID-19 home confinement on neuromuscular, cardiovascular and metabolic health: Physiological and pathophysiological implications and recommendations for physical and nutritional countermeasures. *Eur. J. Sport Sci.* https://doi.org/10.1080/17461391.2020.1761076, 2020.

Zuccarelli L., G. Baldassarre, B. Magnesa, C. Degano, M. Comelli, M. Gasparini, G. Manferdelli, M. Marzorati, I. Mavelli, A. Pilotto, S. Porcelli, L. Rasica, B. Šimunič, R. Pišot, M. Narici, **B. Grassi.** Peripheral impairments of oxidative metabolism after a 10-day bed rest are upstream of mitochondrial respiration. *J. Physiol.* 599: 4813-4829, 2021.

Salvadego D., **B. Grassi**, M. Keramidas, O. Eiken, A. McDonnell, I. Mekjavic. Heterogeneity of human adaptations to bed rest and hypoxia: a retrospective analysis within the skeletal muscle oxidative function. *Am. J. Physiol. Reg. Int. Comp. Physiol.* 321: R813-R822, 2021.

Baldassarre G., L. Zuccarelli, G. Manferdelli, V. Manfredini, M. Marzorati, A. Pilotto, S. Porcelli, L. Rasica, B. Šimunič, R. Pišot, M. Narici, **B. Grassi**. Decrease in work rate in order to keep a constant heart rate: biomarker of exercise intolerance following a 10-day bed rest. *J. Appl. Physiol.* 132: 1569-1579, 2022.

D'Amuri A., J.M. Sanz, S. Lazzer, R. Pišot, B. Šimunič, G. Biolo, G. Zuliani, M. Gasparini, M. Narici, **B. Grassi**, C. Reggiani, E. Dalla Nora, A. Passaro. Irisin attenuates muscle impairment during bed rest through muscle-adipose tissue crosstalk. *Biology* (Basel): 11 (7): 999, 2022.

Sturm G., K.R. Karan, A. Monzel, B.S. Santhanam, T. Taivassalo, C. Bris, S.A. Ware, M. Cross, A. Towheed, A. Higgins-Chen, M.J. McManus, A. Cardenas, J. Lin, E.S. Epel, S. Rahman, J. Vissing, **B. Grassi**, M. Levine, S. Horvath, R.G. Haller, G. Lenaers, D.C. Wallace, M.-P. St-Onge, S. Tavazoie, V. Procaccio, B.A. Kaufman, E.L. Seifert, M. Hirano, M. Picard. OxPhos defects cause hypermetabolism and reduce lifespan in cells and in patients with mitochondrial diseases**.** *Communications Biology* 6: 22, 2023. https://doi.org/10.1038/s42003-022-04303-x.

Weber T., K. Harris, R. Arya, A. Elias, D.C. Green, D. Greaves, L. Petersen, L. Roberts, T. Kamine, L. Mazzolai, A. Bergauer, D. Kim, R.O. Engberink, P. zu Eulenburg, **B. Grassi**, L. Zuccarelli, G. Baldassarre, K. Tabury, S. Baatout, J. Jordan, A. Blaber, A. Choukér, T. Russomano, N. Goswami. Pathophysiology, Risk, Diagnosis, and Management of Venous Thrombosis in Space: Where are we now? *NPJ Microgravity* 16; 9 (1), 17, 2023

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV.

Udine, 12 Aprile 2023

Prof. Bruno Grassi

Firmato digitalmente da: Bruno Grassi
Organizzazione: UNIVERSITAUDINE/01071600306
Limitazioni d'uso: Explicit Text: Il titolare fa uso del presente certificato solo per le finalità di lavoro per le quali esso è rilasciato. The certificate holder must use the certificate only for the purposes for which it is issued.
Data: 20/04/2023 16:22:03