CURRICULUM VITAE

Gianfranco Bosco

Education: 1990 Degree in Medicine and Surgery summa cum laude, University of Catania,
1997 PhD in Peripheral Nervous System Physiopathology, University of Catania

Academic career: 1990-92 Research fellow, Department of Physiology, University of Catania
1992 -96 Postdoctoral Fellow, Department of Physiology, University of Minnesota, Minneapolis;
1997-98 Research Associate / Assistant Professor, Department of Physiology, University of Minnesota, Minneapolis;
1998-2000 Research Associate / Assistant Professor, Department of Neuroscience, University of Minnesota, Minneapolis;
2001-2004 Visiting Professor, Department of Neuroscience, University of Minnesota, Minneapolis;
2000-2005 Researcher, Department of Neuroscience, University of Rome "Tor Vergata";
2005-2013 Associate Professor, Department of Neuroscience and Department of Systems Medicine, University of Rome "Tor Vergata";
2013- Full Professor, Department of Systems Medicine, University of Rome "Tor Vergata";

Awards: SIF award 1998

Teaching Experience

Functional Neuroanatomy College of Biology University of Minnesota Minneapolis, MN USA

Human Physiology Degree in Medical Engineering University of Rome "Tor Vergata";

Human Physiology Medical School University of Tirane “Nostra Signora del Buon Consiglio” Tirane, Albany

Human Physiology Medical School University of Rome “Tor Vergata”

Human Physiology Degree in Sports Science and Technology University of Rome "Tor Vergata";

Practical Medicine II Medical School University of Rome “Tor Vergata;

Physiology of Exercise Degree in Physical Exercise and Health Promotion University of Rome "Tor Vergata";

Human Physiology Medical School (Degree taught in English) University of Rome “Tor Vergata”

Human Physiology Pharmacy (Degree taught in English) University of Rome “Tor Vergata”

Grants:

MIUR: PRIN 2004. Research Unit coordinator: “Neural substrates and adaptive processes of internal models for physical and biological motion perception.“.

MIUR: PRIN 2006. Research Unit coordinator: “Neural basis of the internal model of gravity: functional relevance for manual interception of free-falling objects.

MIUR: PRIN 2008. Research Unit coordinator: “Predictive processes for maual interception and biological motion perception”.

MIUR: PRIN 2017. Research Unit coordinator: “Performing Actions in a Changing Environment”.

Italian Spatial Agency: DCMC Program. Workpackages: PR-DCMC-GO-1B11_2 - Posture and Movement, PR-DCMC-GO-1B11_3 - Vestibular Mechanisms, PR-DCMC-GO-1B139 – Spinal Maps, PR-DCMC-GO-1B134 – Virtual Reality Protocols.

University of Tor Vergata Research Program: Consolidate the Foundations 2015. PI of the project: “Cerebellar and hippocampal involvement in motor adaptation and recovery. A study in healthy humans and transgenic mice models of neurodegeneration.”

Academicianships

Member of the elective board of the Department of Neuroscience of the University of Rome “Tor Vergata”

Member of the scientific board of the Center for Space Biomedicine of the University of Rome “Tor Vergata”

Member for the School of Medicine of the Curriculum Design Committee of the University of Rome "Tor Vergata"

Member of the didactic committee of the School of Medicine of the University of Rome "Tor Vergata"

President of the didactic committee of the International School of Medicine of the University of Rome "Tor Vergata"

Member of the peer student-teacher committee of the Faculty of Medicine of the University of

Rome "Tor Vergata"

Secretary member of the council of the Department of Systems Medicine.

President of the degree course in Medicina e Chirurgia of the University of Rome "Tor Vergata"

Peer Reviewing

Peer reviewer for the following indexed journals:

1) Journal of Neuroscience 2) Journal of Neurophysiology 3) Experimental Brain Research 4) Frontiers in Neuroscience 5) PLOSone 6) Journal of Experimental Psychology 7) Scientific Report

Associate Editor for the Neuroscience Journal; Biomed Research International, Frontiers in Integrative Neuroscience.

PUBLICATIONS

Publications on indexed journals

1) Berretta S., Bosco G., Smecca G., e Perciavalle V. The cerebellopontine system: an electrophysiological study in the rat. *Brain Res 568:*178-84, Elsevier B. V., UK 1991

2) Raffaele R., Cosentino E., Anicito MB., Sciacca A., Rampello L., Pennisi G., Genazzani AA., Bosco G., Casabona A., e Drago F. Effects of TRH-T on spinal motoneurones in man. *Neuroreport 3:* 1017-8, Lippincott, Williams & Wilkins, UK 1992

3) Berretta S., Bosco G., Giaquinta G., Smecca G., e Perciavalle V. Cerebellar influences on accessory oculomotor nuclei of the rat: a neuroanatomical, immunohistochemical, and electrophysiological study. *J Comp Neurol 338:*50-66, Wiley-Liss Inc., USA 1993

4) Bosco G. e Poppele R.E. Broad directional tuning in spinal projections to the cerebellum. *J. Neurophysiol. 70:* 863-6, The American Physiological Society, USA 1993

5) Bosco G., Casabona A. e Perciavalle V.Non-N-methyl-D-aspartate receptors mediate neocerebellar excitation at accessory oculomotor nuclei synapses of the rat. *Arch Ital Biol 132:* 215-27, The University of Pisa, Italia 1994

6) Bosco G., Giaquinta G., Raffaele R., Smecca G. e Perciavalle V. Projections from the cerebral cortex to the accessory oculomotor nuclei of the rat: a neuroanatomical and immunohistochemical study. J Hirnforsch*. 35:* 521-29, Germany 1994

7) Perciavalle V, Bosco G e Poppele R Correlated activity in the spinocerebellum is related to spinal timing generators. *Brain Res 695:*293-7, Elsevier B. V., UK 1995

8) Bosco G., Casabona A., Giaquinta G., Giuffrida R. e Perciavalle V. c-fos expression in the accessory oculomotor nuclei following neocerebellar stimulation. *Neuroreport 7:*2135-8, Lippincott, Williams & Wilkins, UK 1996

9) Bosco G., Casabona A., Giaquinta G., e Perciavalle V. Influences exerted by the frontal eye field on accessory oculomotor nuclei neurons of the rat. *Arch Ital Biol 134:* 305-16, The University of Pisa, Italia 1996

10) Bosco, G. e Poppele R.E. Temporal features of directional tuning by spinocerebellar neurons. Relation to limb geometry. *J. Neurophysiol. 75:* 1647-1658, The American Physiological Society, USA 1996

11) Bosco, G., Rankin A. e Poppele R.E. Representation of passive hindlimb postures in cat spinocerebellar activity. *J. Neurophysiol. 76:* 715-726, The American Physiological Society, USA 1996

12) Bosco G. e Poppele R.E. Representation of multiple kinematic parameters of the cat hindlimb in spinocerebellar activity. *J. Neurophysiol.* Sep;78:1421-32, The American Physiological Society, USA 1997

13) Poppele R.E. e Bosco G. Distribution of activity in the cerebellar cortex resulting from passive limb movement. *Behav. Brain Sci.* 20 (2): 262-3, Cambridge University Press, USA 1997

14) Giaquinta, G., Casabona, A., Valle, MS, Bosco, G. e Perciavalle, V. Spinocerebellar Purkinje cells and rat forelimb postures: a direction-dependent activity. *Neurosci Lett* 3;245(2):81-4, Elsevier B. V., UK 1998]

15) Perciavalle V., Bosco G. e Poppele, RE. Spatial organization of proprioception in the cat spinocerebellum. Purkinje cell responses to passive foot rotation. *Eur. J. Neurosci. 10:*1975-85, Blackwell Publishing, UK 1998

16) Bosco G. e Poppele R.E. Low sensitivity of dorsal spinocerebellar neurons to limb movement speed. *Exp. Brain Res.* 125:313-22, Springer-Verlag, Germany 1999

17) Giaquinta G, Casabona A, Smecca G, Bosco G, Perciavalle V. Cortical control of cerebellar dentato-rubral and dentato-olivary neurons. *Neuroreport*. 10(14):3009-13, Lippincott, Williams & Wilkins, UK 1999

18) Giaquinta G, Casabona A, Valle MS, Bosco G, Perciavalle V. On the relation of rat's external cuneate activity to global parameters of forelimb posture. *Neuroreport*. 10(14):3075-80, Lippincott, Williams & Wilkins, UK 1999

19) Giaquinta G, Valle MS, Caserta C, Casabona A, Bosco G, Perciavalle V. Sensory representation of passive movement kinematics by rat's spinocerebellar purkinje cells. *Neurosci Lett*. 285(1):41-4, Elsevier B. V., UK 2000

20) Bosco G., Poppele R.E., Eian E. Reference frames for spinal proprioception: limb endpoint based or joint-level based? *J Neurophysiol*. 83(5):2931-45, The American

Physiological Society, USA 2000

21) Bosco G. e Poppele R.E. Reference frames for spinal proprioception: kinematics based or kinetics based? *J Neurophysiol*. 83(5):2946-55, The American Physiological Society, USA 2000

22) Bosco G., Giaquinta G, Valle MS, Caserta C, Casabona A, Perciavalle V. Distribution of spinocerebellar Purkinje cell responses to passive forelimb movements in the rat. *Eur. J. Neurosci.* 12: 4063-73, Blackwell Publishing, UK 2000

23) Valle M.S., Bosco G. e Poppele R.E. Information processing in the spinocerebellar system. *Neuroreport*. 11: 4075-9, Lippincott, Williams & Wilkins, UK 2000

24) Bosco G. e Poppele R.E. Spinal proprioception from a spinocerebellar perspective. *Physiol. Rev*. 81: 539-68, The American Physiological Society, USA 2001

25) Bosco G. e Poppele R.E. Encoding of hindlimb kinematics by spinocerebellar circuitry. *Arch Ital Biol,* 140: 185-192, The University of Pisa, Italia 2002

26) Garifoli A., Caserta C., Bosco G., Lombardo S.A., Casabona A. e Perciavalle V. Kinematic features of passive forelimb movements and rat cuneate neuron discharges. *Neuroreport* 13:267-271, Lippincott, Williams & Wilkins, UK

27) Poppele R.E., Bosco G. e Rankin, A. Independent representations of limb axis length and orientation in spinocerebellar response components. *J Neurophysiol* 87: 409–422, The American Physiological Society, USA 2002

28) Casabona A. , Valle M.S. , Bosco G. , Garifoli A., Lombardo S. A., Perciavalle V. Anisotropic representation of forelimb position in the cerebellar cortex and nucleus interpositus of the rat*. Brain Res* 972: 127-136, Elsevier B. V., UK 2003

29) Poppele R.E. e Bosco G. Sophisticated spinal contributions to motor control. *Trends Neurosci*. 26 (5): 269-276, Elsevier B. V., UK 2003

30) Bosco G, Poppele R. Cerebellar afferent systems: can they help us understand cerebellar function? *Cerebellum*. 2(3):162-4, UK 2003

31) Bosco G., Rankin A. e Poppele R.E. Modulation of Dorsal Spinocerebellar Responses to Limb Movement I. Effect of Serotonin*. J Neurophysiol* 90 (5): 3361-71, The American Physiological Society, USA 2003

32) Bosco G. e Poppele R.E. Modulation of Dorsal Spinocerebellar Responses to Limb Movement II. Effect of Sensory Input. *J Neurophysiol*. 90 (5): 3372-83, The American Physiological Society, USA 2003

33) Zago M, Bosco G, Maffei V, Iosa M, Ivanenko YP, Lacquaniti F. Internal models of target motion: expected dynamics overrides measured kinematics in timing manual interceptions. *J Neurophysiol*. , 91: 1620-34, The American Physiological Society, USA 2004

34) Casabona A., Valle MS, Bosco G, Perciavalle V. Cerebellar encoding of limb position. *Cerebellum*. 3(3):172-7, UK 2004

35) Zago M, Bosco G, Maffei V, Iosa M, Ivanenko YP, Lacquaniti F. Fast adaptation of the internal model of gravity for manual interceptions: evidence for event-dependent learning. *J Neurophysiol*., 93(2):1055-68, The American Physiological Society, USA 2005

36) Indovina I, Maffei V, Bosco G, Zago M, Macaluso E, Lacquaniti F. Representation of visual gravitational motion in the human vestibular cortex. *Science*. Apr 15;308(5720):416-9. AAAS, USA 2005

37) Bosco G, Eian J, Poppele RE. Kinematic and non-kinematic signals transmitted to the cat cerebellum during passive treadmill stepping. *Exp Brain Res.* Dec 167(3):394-403. Springer-Verlag, Germany 2005

38) Bosco G, Eian J, Poppele RE. Phase-specific sensory representations in spinocerebellar activity during stepping: evidence for a hybrid kinematic/kinetic framework. *Exp Brain Res.* 175(1):83-96 Springer-Verlag, Germany 2006

39) Valle MS, Casabona A., Bosco G, Perciavalle V. Spatial anisotropy in the encoding of 3D passive limb position by the spinocerebellum. *Neuroscience* 144(3):783-7 Elsevier, UK 2007

40) Miller WL, Maffei V, Bosco G, Iosa M, Zago M, Macaluso E, Lacquaniti F. Vestibular nuclei and cerebellum put visual gravitational motion in context. *J Neurophysiol.* 99(4):1969-82 The American Physiological Society, USA 2008

41) Valle MS, Eian J, Bosco G, Poppele RE Cerebellar cortical activity in the cat anterior lobe during hindlimb stepping. *Exp Brain Res*. 187(3):359-72 Springer-Verlag, Germany 2008

42) Valle MS, Casabona A., Bosco G, Perciavalle V. Comparison of neuronal activities of external cuneate nucleus, spinocerebellar cortex and interpositus nucleus during passive movements of the rat's forelimb, *Neuroscience* 157: 271- 79 Elsevier, UK 2008

43) Bosco G, Carrozzo M, Lacquaniti F. Contributions of the human temporo- parietal junction and MT/V5+ to the timing of interception revealed by TMS. *J Neurosci*. 28: 12071-12084 USA 2008

44) Casabona A, Bosco G, Perciavalle V, Valle MS.Processing of Limb Kinematics in the Interpositus Nucleus. *Cerebellum*. 2010 (1): 103-10.

45) Valle MS, Bosco G, Casabona A, Garifoli A, Perciavalle V, Coco M, Perciavalle V. Representation of Movement Velocity in the Rat's Interpositus Nucleus During Passive Forelimb Movements.*Cerebellum*. 2010 9(2): 249-58.

46) Bosco G. Principal Component Analysis of Electromyographic Signals: An Overview. The Open Rehabilitation Journal. 2010, 3: 127- 131

47) Valle MS, Eian J, Bosco G, Poppele RE. The organization of cortical activity in the anterior lobe of the cat cerebellum during hindlimb stepping. *Exp Brain Res. 2012 216: 349-*

48) Bosco G, Delle Monache S, Lacquaniti F. Catching what we can't see: manual interception of occluded fly-ball trajectories. PloS One. 2012 Nov. 14

49) Lacquaniti F, Bosco G, Indovina I, La Scaleia B, Maffei V, Moscatelli A, Zago M. Visual gravitational motion and the vestibular system in humans. Front Integr Neurosci. 2013 Dec 26;7:101

50) Lacquaniti F, Bosco G, Gravano S, Indovina I, La Scaleia B, Maffei V, Zago M. Multisensory integration and internal models for sensing gravity effects in primates. Biomed Res Int. 2014: 615854

51) Delle Monache S, Lacquaniti F, Bosco G. Eye movements and manual interception of ballistic trajectories: effects of law of motion perturbations and occlusions. Exp Brain Res. 2015; 233(2):359-74.

52) Bosco G, Monache SD, Gravano S, Indovina I, La Scaleia B, Maffei V, Zago M, Lacquaniti F. Filling gaps in visual motion for target capture. Front Integr Neurosci. 2015 Feb 23;9:13

53) Lacquaniti F, Bosco G, Gravano S, Indovina I, La Scaleia B, Maffei V, Zago M. Gravity in the Brain as a Reference for Space and Time Perception. Multisens Res. 2015;28(5-6):397-426

54) Delle Monache S, Lacquaniti F, Bosco G. Differential contributions to the interception of occluded ballistic trajectories by the temporoparietal junction, area hMT/V5+, and the intraparietal cortex. J Neurophysiol 118: 1809–1823, 2017.

55) Valle MS, Bosco G, Poppele RE. Cerebellar compartments for the processing of kinematic and kinetic information related to hindlimb stepping. Exp Brain Res 235: 3437–3448, 2017.

56) Indovina I, Riccelli R, Passamonti L, Maffei V, Bosco G, Lacquaniti F, Toschi N. Structural connectome of the human vestibular, pre-motor, and navigation network. Annu Int Conf IEEE Eng Med Biol Soc. 2018 Jul; 2018: 588-591.

57) Delle Monache S, Lacquaniti F, Bosco G. Ocular tracking of occluded ballistic trajectories: Effects of visual context and of target law of motion. J Vis. 2019 Apr 1;19(4):13.

58) De Sá Teixeira NA, Bosco G, Delle Monache S, Lacquaniti F. The role of cortical areas hMT/V5+ and TPJ on the magnitude of representational momentum and representational gravity: a transcranial magnetic stimulation study. Exp Brain Res. 2019 Dec;237(12): 3375-3390.

59) Indovina I, Bosco G, Riccelli R, Maffei V, Lacquaniti F, Passamonti L, Toschi N. Structural connectome and connectivity lateralization of the multimodal

vestibular cortical network. Neuroimage. 2020 Nov 15;222:117247.

60) Delle Monache S, Indovina I, Zago M, Daprati E, Lacquaniti F, Bosco G. Watching the Effects of Gravity. Vestibular Cortex and the Neural Representation of "Visual" Gravity. Front Integr Neurosci. 2021 Dec 1; 15:793634

Publications on edited books

Bosco G, Lacquaniti F. Locomozione. Chapter XXVI in Fisiologia Medica edited by F. Conti ed. Edi-Ermes, Milano ISBN: 8870512827