

## **Giancarlo Panzica**

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Born in Milano (Italy), August 17, 1949.

Married with two daughters

### **Education**

1973 - Master degree in Biological Sciences (University of Torino, Italy).

1993 - PhD in Neuroscience (University of Salamanca, Spain).

### **ACADEMIC POSITION AND TEACHING**

#### **Academic Positions**

2007-today – Head of the Department of Anatomy, Pharmacology and Forensic Medicine.

2000-today - Full Professor of Human Anatomy, Faculty of Science, University of Torino (Italy)

1990-2000 – Associate Professor of Human Anatomy, Faculty of Science, University of Torino (Italy)

1980-1990 – Researcher of Histology and Human Anatomy, School of Medicine, University of Torino (Italy)

1988 - Visiting Professor at the University of Oviedo (Spain), and at the Universidad Nacional de Educacion a Distancia, Madrid, Spain.

1982 – Research Fellow of DAAD at University of Giessen (Germany)

#### **Teaching activity**

1990-2006 - Human Anatomy, Faculty of Science, University of Torino (Italy)

2004-today - Neuroanatomy, Faculty of Science, University of Torino (Italy)

2004-today - Behavioral Neuroendocrinology, Faculty of Science, University of Torino (Italy)

2004-today - Laboratory of Image Analysis, Faculty of Science, University of Torino (Italy)

2004-today Coordinator of Master degree in Neurobiology, Faculty of Science, University of Torino (Italy)

#### **Affiliations**

Department of Anatomy, Pharmacology and Forensic Medicine (Head since 2007)

Rita Levi Montalcini Center for Brain Repair (since 2000)

National Institute for Neuroscience (INN, since 2006)

Neuroscience Institute of Turin (NIT, since 2007, member of the board)

## **RESEARCH ACTIVITIES**

### **Editorial boards**

Member of the Editorial board of:

- Hormones and Behavior
- Domestic Animal Endocrinology
- Cell and Tissue Research
- European Journal of Anatomy

### **Scientific societies**

Member of:

- Society for Behavioral Neuroendocrinology (SBN)
- Society for Neuroscience (SfN)
- Société de Neuroendocrinologie Expérimentale (SNE)
- Federation of European Societies for Neuroscience (FENS)
- Italian Society for Neuroscience (SINS, Secretary and Member of the Board)
- Italian Society of Anatomy and Histology (SIA)
- Gruppo Italiano per lo Studio della Neuromorfologia (GISN)
- Gruppo Italiano per le Scienze Neuroendocrine (GISNe, Member of the Board)

### **Research**

Dr. Panzica's scientific interests are centered on the steroid regulation of central nervous system. Main topics are: the effects of gonadal hormones on the expression of some neuropeptides and receptors, the influence of gonadal hormones on the development of hypothalamic and limbic circuits, and the effects of endocrine disruptors on neural circuits and behavior. These researches has been done also in cooperation with several international laboratories, including those of Drs. Jacques Balthazart and Julie Bakker (Liege, Belgium), Roland Grossmann (Mariensee, Germany), Antonio Guillamon and Paloma Collado (Madrid, Spain), Horst-W. Korf (Frankfurt, Germany), Mary Ann Ottinger (College Park, MD, USA), Fernando Sanchez (Salamanca, Spain), Krister Halldin (Stockholm, Sweden), and Pierre Deviche (Phoenix, AZ, USA).

### **Grants**

The scientific activity has been supported by:

European Brain and Behavior training program

NATO

European Union

National Science Foundation (USA)

Ministry of University (PRIN)

University of Torino

Regione Piemonte

Fondazione CRT

Selected Publications (from 1995)

1. **Panzica** G.C., Aste N., Viglietti-Panzica C., Ottinger M.A. (1995) Structural sex differences in the brain: influence of gonadal steroids and behavioral correlates. *J.Endocrinological Investigations*, 18, 232-252.
2. **Panzica** G.C., Viglietti-Panzica C., Balthazart J. (1996) The sexually dimorphic medial preoptic nucleus of quail: a key brain area mediating steroid action on male sexual behavior. *Front.Neuroendocrinol.*, 17, 51-125.
3. Jurkevich A., Barth S., Aste N., **Panzica** G.C., Grossmann R. (1996) Intracerebral sex differences in the vasotocin system in birds: possible implication in behavioral and autonomic functions. *Horm.Behav.*, 30, 673-681.
4. **Panzica** G.C., Garcia-Ojeda E., Viglietti-Panzica C., Thompson N.E., Ottinger M.A. (1996) Testosterone effects on vasotocinergic innervation of sexually dimorphic medial preoptic nucleus and lateral septum during aging in male quail. *Brain Res.*, 712, 190-198
5. **Panzica** G.C., Castagna C., Aste N., Viglietti-Panzica C., Balthazart J. (1996) Testosterone effects on the neuronal ultrastructure in the medial preoptic nucleus of male Japanese quail. *Brain Res. Bull.*, 39, 281-292
6. Balthazart J., Absil P., Viglietti-Panzica C., **Panzica** G.C. (1997) Vasotocinergic innervation of areas containing aromatase-immunoreactive cells in the quail forebrain. *J.Neurobiol.*, 33, 45-60.
7. **Panzica** G.C., Garzino A. (1997) Anatomically specific colocalization of NADPH-diaphorase and cholinacetyltransferase in the quail brainstem. *Neurosci.Lett.*, 231, 151-154.
8. Ottinger M.A., Thompson N., **Panzica** G.C., Viglietti-Panzica C. (1997) Neuroendocrine regulation of GnRH and behavior during aging in birds. *Brain Res.Bull.*, 44, 471-477.
9. Aste N., **Panzica** G.C., Viglietti-Panzica C., Harada N., Balthazart J. (1998) Distribution and effects of testosterone on aromatase mRNA in the quail forebrain: A non-radioactive *in situ* hybridization study. *J.Chem.Neuroanat.*, 14, 103-115.
10. Aste N., Balthazart J., Absil P., Grossmann R., Mülhbauer E., Viglietti-Panzica C. and **Panzica** G. C. (1998) Anatomical and neurochemical definition of the nucleus of the stria terminalis in Japanese quail (*Coturnix japonica*). *J.Comp.Neurol.*, 396, 141-157.
11. Oberto A., Tolosano E., Brusa R., Altruda F., **Panzica** G.C., Eva C. (1998) The murine Y<sub>1</sub> receptor 5' upstream sequence directs cell-specific and developmentally regulated *LacZ* expression in transgenic mice CNS. *Europ.J.Neurosci.*, 110, 3257-3268.
12. **Panzica** G.C., Castagna C., Viglietti-Panzica C., Russo C., Tlemçani O., Balthazart J. (1998) Organizational effects of estrogens on brain vasotocin and sexual behavior in quail. *J.Neurobiol.*, 37, 684-699.
13. **Panzica** G.C., Plumari L., García-Ojeda E., Deviche P. (1999) Central vasotocin-immunoreactive system in a male passerine migratory bird (*Junco hyemalis*). *J.Comp.Neurol.*, 409, 105-117.
14. **Panzica** G. C., Pessatti M., Viglietti-Panzica C., Grossmann R., Balthazart J. (1999) Effects of testosterone on sexually dimorphic parvocellular neurons expressing vasotocin mRNA in the male quail brain. *Brain Res.*, 850, 55-62.
15. Oberto A., **Panzica** G.C., Altruda F., Eva C. (2000) Chronic modulation of GABA<sub>A</sub> receptor complex regulates Y<sub>1</sub> receptor gene expression in the medial amygdala of transgenic mice. *Neuropharmacology*, 39, 227-234
16. Melcangi R.C., **Panzica** G.C. (2001) Steroids in the nervous system: a Pandora's box? *Trends Neurosci.*, 24, 311-312.
17. Zammaretti F., **Panzica** G.C., Eva C. (2001) Fasting, leptin treatment and glucose administration differentially regulate Y<sub>1</sub> receptor gene expression in the hypothalamus of transgenic mice. *Endocrinology*, 142, 3774-3782.

18. Oberto A., **Panzica** G.C., Altruda F., Eva C. (2001) GABAergic and NPY-Y<sub>1</sub> network in the medial amygdala: a neuroanatomical basis for their functional interaction. *Neuropharmacology*, 41, 639-642.
19. Ferrara G., Serra M., Zammaretti F., Pisu M.G., **Panzica** G.C., Biggio G., Eva C. (2001) Increased expression of the neuropeptide Y receptor Y1 gene in the medial amygdala of transgenic mice induced by long-term treatment with progesterone or allopregnanolone. *J. Neurochem*, 79, 417-425.
20. Peretto P., Giachino C., **Panzica** G.C., Fasolo A. (2001) Sexually dimorphic neurogenesis is topographically matched with the anterior accessory olfactory bulb of the adult rat. *Cell Tissue Res.*, 306, 385-389.
21. Viglietti-Panzica C., Balthazart J., Plumari L., Fratesi S., Absil P., **Panzica** G.C. (2001) Estradiol mediates effects of testosterone on vasotocin-immunoreactivity in the adult quail brain. *Horm. Behav.*, 40, 445-461.
22. **Panzica** G.C., Viglietti-Panzica C., Balthazart J. (2001) Sexual dimorphism in the neuronal circuits of the quail preoptic and limbic regions. *Microsc. Res. Techn.*, 54, 364-374.
23. Aste N., Cozzi B., Stankov B., **Panzica** G.C. (2001) Sexual differences and effect of photoperiod on melatonin receptor in avian brain. *Microsc. Res. Techn.*, 55, 37-47.
24. Absil P., Baillien M., Ball G.F., **Panzica** G.C., Balthazart J. (2001) The control of preoptic aromatase activity by afferent inputs in Japanese quail. *Brain Res. Rev.*, 37, 38-58.
25. **Panzica**, G.C., Aste, N., Castagna, C., Viglietti Panzica, C. and Balthazart, J. (2001) Steroid-induced plasticity in the sexually dimorphic vasotocinergetic innervation of the avian brain: behavioral implications, *Brain Res. Rev.*, 37, 178-200.
26. Absil P., Papello M., Viglietti-Panzica C., Balthazart J., **Panzica** G.C. (2002) The origins of the vasotocinergetic innervation of the medial preoptic nucleus in male quail: a tract-tracing and immunocytochemical study. *J. Chem. Neuroanat.*, 24, 27-39.
27. Plumari L., Viglietti-Panzica C., Allieri F., Honda S., Harada N., Balthazart J., **Panzica** G.C. (2002) Changes in the arginine-vasopressin immunoreactive systems in male mice lacking a functional aromatase gene. *J. Neuroendocrinology*, 14, 971-978.
28. **Panzica**, G.C., Balthazart, J., Pessatti, M., and Viglietti Panzica, C. (2002) The parvocellular vasotocin system of Japanese quail: a developmental and adult model for the study of influences of gonadal hormones on sexually differentiated and behaviorally relevant neural circuits. *Environ. Health. Persp.*, 110, Suppl.3, 423-428.
29. Balthazart J., **Panzica** G.C., Krohmer R.W. (2003) Anatomical relationships between aromatase-immunoreactive neurons and nitric oxide synthase as evidenced by NOS immunohistochemistry or NADPH diaphorase histochemistry in the quail forebrain. *J. Chem. Neuroanat.*, 25, 39-51.
30. Castagna C., Viglietti-Panzica C., **Panzica** G.C. (2003) Protein S100 immunoreactivity in glial cells and neurons of the Japanese quail brain. *J. Chem Neuroanat*, 25: 195-212.
31. Collado P., Guillamon A., Pinos H., Perez-Izquierdo M.A., Garcia-Falgeras A., Carrillo B., Rodriguez C., **Panzica** G.C. (2003) NADPH-diaphorase activity increases during estrous phase in the bed nucleus of the accessory olfactory tract in the female rat. *Brain Res.*, 983: 223-229.
32. Oberto A., Mele P., Zammaretti F., **Panzica** G.C., Eva C. (2003) Evidence of altered neuropeptide Y content and neuropeptide Y1 receptor gene expression in the hypothalamus of pregnant transgenic mice. *Endocrinology*, 144: 4826-4830
33. Melcangi R.C., **Panzica** G.C. (2003) Steroids and nervous system. *Ann. N.Y. Acad. Sci.*, 1007, 1-5
34. Plumari L., Plateroti S., Deviche P., **Panzica** G.C. (2004) Region-specific testosterone modulation of the vasotocin-immunoreactive system in male Dark-eyed junco, *Junco hyemalis*. *Brain Res.*, 999: 1-8.
35. Gotti S., Chiavegatto S., Sica M., Viglietti-Panzica C., Nelson R.J., **Panzica** G.C. (2004) Alteration of NO-producing system in the basal forebrain and hypothalamus

- of Ts65Dn mice: an immunohistochemical and histochemical study of a murine model for Down syndrome. *Neurobiol. Dis.*, 16:563-71
36. Eva C., Mele P., Oberto A., **Panzica G.C.**, Pisu M.G., Serra M. (2004) Neuroanatomical and pharmacological evidence for a functional interaction between GABAergic and NPY-Y1 transmission in the amygdala of Y1R/LacZ transgenic mice. *Critical Reviews in Neurobiology* 16: 33-41
  37. Ottinger M.A., Abdelnabi M., Li Q., Chen K., Thompson N., Harada N., Viglietti-Panzica C., **Panzica G.C.** (2004) The Japanese quail: a model for studying reproductive aging of hypothalamic system. *Exp. Gerontol.* 39: 1679-1693
  38. **Panzica G.C.**, Viglietti-Panzica C., Ottinger M.A. (2005) Introduction: neurobiological impact of environmental estrogens. *Brain Res. Bull.*, 65, 187-191
  39. Viglietti-Panzica C., Montoncello B., Mura E., Pessatti M., **Panzica G.C.** (2005) Organizational effects of diethylstilbestrol on brain vasotocin and sexual behavior in male quail. *Brain Res. Bulletin*, 65, 225-233
  40. Gotti S., Sica M., Viglietti-Panzica C., **Panzica G.C.** (2005) Distribution of nitric oxide synthase immunoreactivity in the mouse brain. *Micr. Res. Techn.*, 68: 13-35
  41. **Panzica G.C.**, Mura E., Pessatti M., Viglietti-Panzica C. (2005) Early embryonic administration of xenoestrogens alters vasotocin system and male sexual behavior of the Japanese quail. *Dom. An. Endocr.*, 29: 436-445.
  42. Ottinger M.A., Quinn M.J., Lavoie E., Abdelnabi M., Thompson N., Hazelton J., McKernan M., Wu J., Henry P., Viglietti-Panzica C., **Panzica G.C.** (2005) Neuroendocrine and behavioral consequences of embryonic exposure to endocrine disrupting chemicals. In: *Functional Avian Endocrinology* (Dawson A., Sharp P.J., eds), Narosa Publ.House, New Dehli. pp. 271-284
  43. De Vries G.J., **Panzica G.C.** (2006) Sexual differentiation of central vasopressin and vasotocin systems in vertebrates: different mechanisms, similar endpoints. *Neuroscience*, 138: 947-955.
  44. **Panzica G.C.**, Viglietti-Panzica C., Sica M., Gotti S., Martini M., Pinos H., Carrillo B., Collado P. (2006) Effects of gonadal hormones on central nitric oxide producing systems. *Neuroscience*, 138: 987-995.
  45. Melcangi R.C., **Panzica G.C.** (2006) Neuroactive steroids: old players in a new game. *Neuroscience*, 138: 733-739
  46. Eva C., Serra M., Mele P., **Panzica G.C.**, Oberto A. (2006) Physiology and gene regulation of brain NPY Y1 receptor. *Front. Neuroendocrinology*, 27: 308-339.
  47. Viglietti-Panzica C., Mura E., **Panzica G.C.** (2007) Effects of early embryonic exposure to genistein on male copulatory behavior and vasotocin system of Japanese quail. *Horm. Behav.* 51: 355-363
  48. Carrillo B., Pinos, H., Guillamon A., **Panzica G.C.**, Collado P. (2007) Morphometrical and neurochemical changes in the anteroventral subdivision of the rat medial amygdala during estrous cycle. *Brain Res.*, 1150:83-93.
  49. Zammaretti F., **Panzica G.C.**, Eva C. (2007) Sex-dependent regulation of hypothalamic NPY-Y1 receptor gene expression in moderate/high fat, high energy diet fed mice. *J.Physiology (London)*, 583:445-453.
  50. **Panzica G.C.**, Viglietti-Panzica C., Mura E., Quinn M. jr., Lavoie E., Palanza P., Ottinger M.A. (2007) Effects of xenoestrogen on the differentiation of behaviorally relevant neural circuits. *Front. Neuroendocrinology*, 28:179-200.
  51. Pierman S., Sica M., Allieri F., Viglietti-Panzica C., **Panzica G.C.**, Bakker J. (2008) Activational effects of estradiol and dihydrotestosterone on social recognition and the arginine-vasopressin immunoreactive system in male mice lacking a functional aromatase gene. *Horm. Behav.* 54: 98-106.
  52. Martini M., Di Sante G., Collado P., Pinos H., Guillamon A., **Panzica G.C.** (2008) Androgen receptors are required for full masculinization of nitric oxide synthase system in rat limbic hypothalamic region. *Horm. Behav.* 54: 557-564
  53. Ottinger M.A., Lavoie E., Thompson N., Barton A., Whitehouse K., Barton M., Abdelnabi M., Quinn M.jr., **Panzica G.C.**, Viglietti-Panzica C. (2008)

- Neuroendocrine and behavioral effects of embryonic exposure to endocrine disrupting chemicals in birds. *Brain Res. Reviews*, 57: 376-385
54. Morale M.C., L'Episcopo F., Tirolò C., Giaquinta G., Caniglia S., Testa N., Arcieri P., Serra P-A., Lupo G., Alberghina M., Harada N., Honda S., **Panzica** G.C., Marchetti B. (2008) Loss of aromatase cytochrome P450 function as a risk factor for Parkinson's disease? *Brain Research Reviews*, 57: 431-443.
  55. **Panzica** G.C., Melcangi, R.C. (2008) The endocrine nervous system: Source and target for neuroactive steroids. *Brain Res Rev* 57: 271-276
  56. Mattsson A., Mura E., Brunstrom B., **Panzica** G.C., Halldin K. Selective activation of estrogen receptor alpha in Japanese quail embryos affects reproductive organ differentiation but not the male sexual behavior or the parvocellular vasotocin system. *Gen. Comp. Endocrinol.*, *in press*.
  57. **Panzica** G.C., Mura E., Miceli D., Martini M.A., Gotti S., Viglietti-Panzica C. Effects of xenoestrogens on the differentiation of behaviorally-relevant neural circuits in higher vertebrates. In: *Trends in Comparative Endocrinology and Neurobiology* (H. Vaudry, M. Vallarino, E. Rubois, eds) New York Acad Sci., New York, *in press*,

#### **Editor of books and special issues**

- Neuropeptides and neuronal circuitries (G. Filogamo and G.C. **Panzica**, eds), *Special Issue* di Basic and Applied Histochemistry, vol. 32/1, 1988, pp 1-192.
- Image analysis in neurohistology (A. Fasolo, G.C. **Panzica**, L. Calzà, L. Giardino, eds), 1989, CSI-Piemonte: Torino, pp. 1-164.
- Hormones, Brain, and Behavior (G.C. **Panzica** and J. Balthazart eds). *Special Issue* of Brain Research Bulletin, vol.44/4, 1997, pp.319-557;
- The Role of Nitric Oxide (G.C. **Panzica** ed). *Special Issue* of Eur. J. Anatomy, vol.2/1, 1998, pp.25-76;
- Neuroactive steroids for the third millenium (Melcangi R.C. and **Panzica** G.C. eds). *Brain Res. Reviews*, vol. 37 (1-3), 2001, pp. 1-384;
- Steroids and Nervous System. (G.C. **Panzica** and R.C. Melcangi eds), *Annals of the New York Academy of Sciences*, 2003, Vol. 1007, , pp.1-406;
- Action of environmental estrogens on neural circuits and behavior (G.C. **Panzica** and M.A. Ottinger, eds), *Brain Res. Bull.*, 2005, special issue, 65.
- Neuroactive steroids: Old players in a new game (R.C. Melcangi and G.C. **Panzica**), *Neuroscience*, 2006, special issue, 138(3).
- The endocrine nervous system: source and target for neuroactive steroids. (a cura di R.C. Melcangi e G.C. **Panzica** ), *Special Issue*, *Brain Res. Reviews*, vol. 57, 2008.