

## Prof. Egidio D'Angelo– CV

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Born in Cremona, 03-07-1960

1979. Scientific Lyceum (60/60), Cremona.

1979. fellow by Collegio Ghislieri, Pavia.

1985. Degree in Medicine with honors.

1989. Specialization in Neurology with honors, IRCCS C. Mondino, Pavia.

1989. Fellow of European Science Foundation, Prof. John Garthwaite, Liverpool (UK).

1991. Fellow of European Science Foundation, Prof. Per Andersen, Oslo (Norway).

1995. SIF prize for young physiologist (Società Italiana di Fisiologia)

1996. Visiting Professor, Università di Heidelberg.

1996. University Researcher, University of Pavia.

1998. Associate Professor, University of Parma.

2000. Visiting Professor, University of Jerusalem.

2005. Full Professor of Physiology, University of Pavia. Sector BIO-09, Faculty of Pharmacy.

2008. Director of the PhD Schol in Physiology and Neuroscience of the University of Pavia.

2009. Director of BCC (Brain Connectivity Center) for neuroscience research, IRCCS C.Mondino, Pavia.

### **Current projects:**

- 1) *PRIN (MIUR). 2007 - 2008* – Induction and expression mechanism of long-term depression at the cerebellum input stage
- 2) *SENSOPAC 2006-2010 – EC (IP)*. Sensorimotor structuring of perception and action for emerging cognition. Direzione Scientifica e PI
- 3) *CYBERRAT 2008-2010 – EC (STREP)*. A Brain-Chip Interface for High-resolution Bi-directional Communication. PI.
- 4) *CNISM – progetti d'innescò – 2007-2009*. Imaging multiple single-neuron activities to reconstruct network computations. Coordinatore generale, in collaborazione con LENS – Firenze
- 5) *Ricerca Corrente – Ministero della Sanità. 2009-2011*

### **Main research lines:**

The group is presently working on the following projects in the cerebellar cortex in situ and in vivo:

- Biophysical properties of glutamate ionotropic receptors (AMPA and NMDA);
- Biophysical properties of Na<sup>+</sup> channels and axonal membrane excitability
- LTP/LTD learning rule and modulation by acetylcholine
- Oscillations and resonance in local microcircuits
- Quantal analysis of synaptic transmission and plasticity
- Determination of excitation and learning dynamics in the cerebellar network
- Animal models of pathology (prion disease, channelopathies)
- VSD imaging and MEA recordings of network activity in situ and in vivo
- fMRI and EEG analysis of the cortico-cerebellar loop in physiological and pathological conditions in humans

- Mathematical modeling of neuronal excitability, synaptic transmission, and network dynamics

***Main techniques:***

- Patch-clamp and calcium imaging in brain slices;
- Extracellular field recording in brain slices and in vivo;
- Voltage-sensitive dye (VSD) imaging in vitro and in vivo
- Multielectrode (MEA) recordings in situ;
- Mathematical modeling of neuronal activity;
- Molecular biology
- Combined EEG and fMRI in humans

***10 selected references (out of 48):***

1. D'Angelo E., Rossi P., and Garthwaite J. (1990). Dual component NMDA receptor currents at a single central synapse. **Nature** 346:467-470
2. Armano S, Rossi P, Taglietti V, D'Angelo E (2000) Long-term potentiation of intrinsic excitability at the mossy fiber – granule cell synapse of rat cerebellum. **J Neurosci**, 15:5208-5216.
3. D'Angelo E, Nieuwenhuis T, Maffei A, Armano S, Rossi P, Taglietti V, Fontana A, Naldi G (2001) Theta-frequency bursting and resonance in cerebellar granule cells: experimental evidence and modeling of a slow K<sup>+</sup>-dependent mechanism. **J. Neurosci.** 21, 759-770.
4. Christian Hansel, David J. Linden, Egidio D'Angelo (2001) Beyond Parallel Fiber LTD: The Diversity of Synaptic and Non-Synaptic Plasticity in the Cerebellum. **Nature Neuroscience** 4:467-475.
5. David Gall, Francesca Prestori, Elisabetta Sola, Anna D'Errico, Celine Roussel, Lia Forti, Paola Rossi, and Egidio D'Angelo (2005) Intracellular calcium regulation by burst discharge determines bidirectional long-term synaptic plasticity at the cerebellum input stage. **J Neuroscience**, 4813-1822.
6. Offenhauser N, Castelletti D, Mapelli L, Soppo BE, Regondi MC, Rossi P, D'Angelo E, Frassonni C, Amadeo A, Tocchetti A, Pozzi B, Disanza A, Guarneri D, Betsholtz C, Scita G, Heberlein U, Di Fiore PP. (2006) Increased ethanol resistance and consumption in Eps8 knockout mice correlates with altered actin dynamics. **Cell** 127(1):213-226.
7. Jonathan Mapelli, Egidio D'Angelo. (2007) The Spatial Organization of Long-Term Synaptic Plasticity at the Input Stage of Cerebellum. **J. Neuroscience** 27(6): 1285-1296.
8. Goldfarb M, Schoorlemmer J, Williams A, Mukundanunni SD, Huang X, Giza J, Tchetchik D, Kelley K, Vega A, Matthews G, Rossi P, Ornitz D, and D'Angelo E (2007) Fibroblast growth factor homologous factors control neuronal excitability through modulation of voltage-gated sodium channels. **Neuron**,55:449-463
9. Roggeri L, Riviaccio B, Rossi P, D'Angelo E (2008) Tactile stimulation evokes long-term synaptic plasticity in the granular layer of cerebellum". **J Neuroscience**, 28:6354-6359
10. D'Angelo, E., DeZeeuw, C (2008). Timing and plasticity in the cerebellum: focus on the granular layer. **TINS**, 32(1):30-40.