

# EDOARDO MARCORA, PH.D.

M/C 216-76 · California Institute of Technology · Pasadena, CA 91125 ☎ +1-626-628-5342 · ✉ marcora@caltech.edu

## EDUCATION

- 2002      **Doctor of Philosophy in Molecular, Cellular and Developmental Biology**  
*University of Colorado at Boulder · Boulder, CO (USA)*  
Dissertation: NeuroD interaction with HAP1 and MLK2: Huntingtin as a scaffold for NeuroD signalling.
- 1996      **CSHL Course: Early Development of *Xenopus laevis***  
*Cold Spring Harbor Laboratory · Cold Spring Harbor, NY (USA)*
- 1995      **Dottore in Scienze Biologiche, Valedictorian**  
*University of Pavia · Pavia, PV (ITA)*  
Dissertation: N-(4-hydroxyphenyl)retinamide: A potent inducer of apoptosis in human neuroblastoma cells.
- 1994      **EU Course: Developmental and Functional Aspects of Human Brain**  
*University of Udine · Udine, UD (ITA)*
- 1992      **Erasmus Course: Molecular Approaches to Genetic Analysis**  
*University of Paris VII · Paris (FRA)*

## RESEARCH EXPERIENCE

- 2008-Present      **Senior Research Fellow**  
*California Institute of Technology · Pasadena, CA (USA)*  
Concentration: Generation and initial phenotypic characterization of a novel mouse model to study the effects of wild-type Huntingtin gene inactivation in the adult brain
- 2003-2008      **Postdoctoral Scholar**  
*California Institute of Technology · Pasadena, CA (USA)*  
Supervisor: Prof. Mary B. Kennedy  
Concentration: Normal function of Huntingtin in synapses; defective synapse-to-nucleus transport of NF- $\kappa$ B in the molecular pathogenesis of Huntington's disease.
- 1996-2002      **Graduate Student Researcher**  
*University of Colorado at Boulder · Boulder, CO (USA)*  
Supervisor: Prof. Jackie E. Lee  
Concentration: NeuroD protein-protein interactions; post-translation control of NeuroD activity; NeuroD signaling and Huntington's disease.
- 1995-1996      **Research Scholar**  
*University of Colorado Health Sciences Center · Denver, CO (USA)*  
Supervisor: Prof. Jackie E. Lee  
Concentration: NeuroD expression pattern in the developing and adult mouse.
- 1993-1995      **Undergraduate Student Researcher**  
*University of Pavia · Pavia, PV (ITA)*  
Supervisor: Prof. Giuliano Della Valle  
Concentration: Use of retinoids for the treatment of neuroblastoma.

## TEACHING EXPERIENCE

- 2008            **Mentor**  
*California Institute of Technology · Pasadena, CA (USA)*  
Course: Caltech Summer Undergraduate Research Fellowship (SURF)  
Student: Martina DeSalvo (UC Berkeley)  
Project: Generation and initial phenotypic characterization of a novel mouse model to study the effects of wild-type Huntingtin gene inactivation in the adult brain.
- 2007            **Mentor**  
*California Institute of Technology · Pasadena, CA (USA)*  
Course: Caltech Summer Undergraduate Research Fellowship (SURF)  
Student: Martina DeSalvo (UC Berkeley)  
Project: Development of a novel synapse-to-nucleus transport assay to probe the normal function of Huntingtin and its role in the etiology of Huntington's disease.
- 2006            **Mentor**  
*California Institute of Technology · Pasadena, CA (USA)*  
Course: Caltech Summer Undergraduate Research Fellowship (SURF)  
Student: John Yong (Chinese University of Hong Kong)  
Project: Development of a Huntingtin knock-down model in primary neuronal cultures to study wild-type Huntingtin function.
- 2001-2002      **Mentor**  
*University of Colorado at Boulder · Boulder, CO (USA)*  
Course: MCDB Departmental Undergraduate Honors Program (UROP)  
Student: Zhi Mao (CU Boulder)  
Project: Generation of a Huntingtin-associated protein 1 (HAP1) mouse knock-out model by gene targeting.
- 1997            **Teaching Assistant and Lab Instructor**  
*University of Colorado at Boulder · Boulder, CO (USA)*  
Course: Developmental Biology, MCDB Undergraduate Program  
Lecturer: Prof. William B. Wood
- 1997            **Teaching Assistant and Lab Instructor**  
*University of Colorado at Boulder · Boulder, CO (USA)*  
Course: Cell Biology, MCDB Undergraduate Program  
Lecturer: Prof. Bradley B. Olwin

## PROFESSIONAL EXPERIENCE

- 1989-1993      **Director, Computer Operations and Software Development**  
*Plastovacuum · Varese, VA (ITA)*  
Concentration: Management of computer, networking, database, and backup systems; development of office automation and accounting software.

## GRANTS AND AWARDS

- 2008            **High Q Discovery Initiative Research Grant (investigator)**  
*High Q Foundation · New York, NY (USA)*  
Project: Generation and initial phenotypic characterization of a novel mouse model to study the effects of wild-type Huntingtin gene inactivation in the adult brain.

- 2007 **HDSA Research Grant (co-investigator)**  
*Huntington's Disease Society of America · New York, NY (USA)*  
Project: NF- $\kappa$ B signaling from synapse to nucleus in Huntington's Disease.
- 2005-2006 **E. S. Gosney Postdoctoral Fellowship (recipient)**  
*California Institute of Technology · Pasadena, CA (USA)*
- 2003-2004 **Milton Wexler Award (recipient)**  
*Hereditary Disease Foundation · New York, NY (USA)*
- 2003-2004 **John J. Wasmuth Postdoctoral Fellowship (recipient)**  
*Hereditary Disease Foundation · New York, NY (USA)*  
Project: Normal function of Huntingtin in synapses.

### SELECTED PUBLICATIONS

- 2009 Marcora E, Kennedy MB  
*The Huntington's disease mutation impairs Huntingtin's role in the transport of NF- $\kappa$ B from the synapse to the nucleus.*  
**Journal of Neuroscience** (in revision)
- 2008 Marcora E, Carlisle HJ, Kennedy MB  
*The role of the postsynaptic density and the spine cytoskeleton in synaptic plasticity.*  
**Learning and Memory: A Comprehensive Reference, Elsevier**, edited by Byrne JH, Eichenbaum H, Menzel R, Roediger H and Sweatt D ISBN: 0123705045 (in press)
- 2008 Carlisle HJ, Manzerra P, Marcora E, Kennedy MB  
*SynGAP regulates steady-state and activity-dependent phosphorylation of cofilin.*  
**Journal of Neuroscience** 28(50):13673-13683
- 2008 Kennedy MB, Marcora E, Carlisle HJ  
*Scaffold proteins in the postsynaptic density.*  
**Structural and Functional Organization of the Synapse, Springer**, edited by Hell JW and Ehlers MD ISBN: 0387772316
- 2005 Marcora E, Jamitzky F  
*Implementing an ImageJ plugin in Jython.*  
**Python Cookbook, 2nd ed., O'Reilly**, edited by Martelli A, Ravenscroft A and Ascher D ISBN: 0596007973
- 2005 Itkin-Ansari P, Marcora E, Geron I, Tyrberg B, Demeterco C, Hao E, Padilla C, Ratineau C, Leiter A, Lee JE, Levine F  
*NeuroD1 in the endocrine pancreas: localization and dual function as an activator and repressor.*  
**Developmental Dynamics** 233(3):946–53
- 2005 Dufton C, Marcora E, Chae JH, McCullough J, Eby J, Hausburg M, Stein GH, Khoo S, Cobb MH, Lee JE  
*Context-dependent regulation of NeuroD activity and protein accumulation.*  
**Molecular and Cellular Neuroscience** 28(4):727-36
- 2003 Marcora E and Lee JE  
*NeuroD interaction with HAP1 and MLK2: Huntingtin as a scaffold for NeuroD signalling.*  
**Proceedings of the National Academy of Sciences** 100(16):9578–83

- 1999 Sharma A, Moore M, Marcora E, Lee JE, Qiu Y, Samaras S, Stein R  
*The NeuroD1/BETA2 sequences essential for insulin gene transcription colocalize with those necessary for neurogenesis and p300/CREB binding protein binding.*  
**Molecular and Cellular Biology** 19(1):704-13
- 1997 Marcora E and Lee JE  
*The expression pattern of NeuroD suggests it plays a role in the development of neural, endocrine, and neuroendocrine structures.*  
**Developmental Biology** 186(300):A220
- 1994 Mariotti A<sup>§</sup>, Marcora E<sup>§</sup>, Bunone G, Costa A, Veronesi U, Pierotti MA and Della Valle G  
<sup>§</sup> equal contribution  
*N-(4-hydroxyphenyl)retinamide: A potent inducer of apoptosis in human neuroblastoma cells.*  
**Journal of the National Cancer Institute** 86(16):1245-7

### INVITED TALKS

- 2009 “Synapses: From Molecules to Circuits & Behavior”, Cold Spring Harbor Laboratory Meetings & Courses Program  
*Cold Spring Harbor, NY (USA)*
- 2009 Neurobiology Department Seminar Series, Institut de Génomique Fonctionnelle  
*Montpellier (FRA)*
- 2008 Biology Department Seminar Series, Penn State  
*University Park, PA (USA)*
- 2008 Neuroscience 2008, 38th Annual Meeting of the Society for Neuroscience  
*Washington, DC (USA)*
- 2008 Neuroscience Research Colloquia, The Brain Research Centre, University of British Columbia  
*Vancouver, BC (CAN)*
- 2008 41<sup>st</sup> Winter Conference on Brain Research  
*Snowbird, UT (USA)*
- 2007 11<sup>th</sup> Annual HDSA Coalition/Scientific Meeting  
*Boston, MA (USA)*
- 2007 The Mountain School of Arts: Topics in Science and Technology  
*Los Angeles, CA (USA)*
- 2006 The Mountain School of Arts: Topics in Science and Technology  
*Los Angeles, CA (USA)*
- 2005 Gordon Research Conference: CAG Triplet Repeat Disorders  
*Mount Holyoke, MA (USA)*
- 2004 HD 2004: Changes, Advances, and Good News (CAG)<sub>n</sub>  
*Cambridge, MA (USA)*
- 2003 HDF Electrophysiology and NMDA Workshop  
*Playa del Rey, CA (USA)*
- 2002 HD 2002: Changes, Advances, and Good News (CAG)<sub>n</sub>  
*Cambridge, MA (USA)*

## PROFESSIONAL AFFILIATIONS AND ACTIVITIES

**Affiliations** Society for Neuroscience (SfN)  
International Brain Research Organization (IBRO)  
American Association for the Advancement of Science (AAAS)

**Ad Hoc Reviewer** Journal of Neurochemistry

## PROFESSIONAL SKILLS

**Molecular and Cellular Biology** Preparation and analysis of DNA (plasmid, genomic, viral and cDNA); PCR (analytical, cloning, genotyping, quantitative, real-time, and RT-PCR); enzymatic manipulation of DNA and molecular cloning; preparation and analysis of RNA; RNA interference (RNAi); construction and screening of genomic and cDNA libraries; site-directed mutagenesis of DNA.

Preparation and analysis of proteins; design and preparation of viral particles; bacterial and insect cell protein expression; affinity protein purification; HPLC; antibody production and characterization; analysis of protein phosphorylation; analysis of protein-protein interactions (yeast two-hybrid system, coimmunoprecipitation, ELSA); *in vitro* kinase activity assays; transcription factor activity assays (EMSA, ELISA).

Bacterial, yeast and mammalian cell culture and transfection (including primary neuronal cultures and establishment of stable cell lines); subcellular fractionation by differential and density gradient centrifugation; immunocytochemistry; wide-field and laser confocal microscopy (including live cell imaging, photomanipulation, and image processing and analysis).

**Developmental and Organismal Biology** Gene targeting in mouse ES cells; injection of mRNA in *Xenopus laevis* embryos; *in situ* hybridization and immunohistochemistry (sections and whole-mount); anatomical analysis of gene expression patterns in the developing and adult mouse.

**Programming Languages** MS Visual Basic and ASP.NET; Java; Python/Jython; Ruby/JRuby; HTML/XML; CSS; JavaScript; JQuery; AJAX; Google App Engine; Amazon AWS; Ruby On Rails; Zope/Plone; SQL;  $\LaTeX$ ; ImageJ; MATLAB; GNU R.

**Programming Projects (partial list)** 1) ImageJ-Python/Ruby interface to script ImageJ (a scientific image processing and analysis tool) using Jython/JRuby <[http://marcora.caltech.edu/jython\\_imagej\\_howto.html](http://marcora.caltech.edu/jython_imagej_howto.html)>; 2) Plone-based LIMS for the management of transgenic mouse colonies; 3) Ruby-based personal web server application for the procurement, management and full-text search of scientific article reprints <<http://code.google.com/p/pdfetch/>>; 4) Ruby on Rails-based LIMS (Ze Brein) for biology laboratory information management based on a directed acyclic graph of networked content nodes metaphor; 5) Social web application (PubMed On Steroids) for the online management, annotation and peer-review of biomedical articles in the PubMed database, based on Mozilla Firefox Extension, jQuery and AJAX technologies (client) and Google App Engine-based RESTful web service (server).

**Operating Systems and Software Applications** DOS/Windows; Macintosh OS; Unix/XWindows; Vax/VMS; MS Office/ OpenOffice; image processing and analysis tools (ImageJ, AutoQuant, Adobe Photoshop, and others); mathematical and statistical tools (MATLAB, GraphPad, GNU R, and others); bioinformatics tools (Omiga, Vector NTI, Lasergene, EMBOSS, BioPython, BioRuby, and others); relational and object database tools (MS SQL,

MySQL, ZODB, Google Datastore); web server tools (MS IIS, Apache, Mongrel, Nginx, Google Application Engine, and others); development tools (Emacs, Eclipse, SVN, Git, and others).

**Scientific and Technical Writing** Author of successfully funded fellowship and grant applications; author of scientific and technical book chapters (*Learning and Memory: A Comprehensive Reference*, Elsevier, 2008 and *Python Cookbook*, O'Reilly, 2005) and scientific journal articles.

## ADDITIONAL INFORMATION

**Leadership** President of the Caltech Italian Club (2004–2007)

**Hobbies** Flying helicopters, riding motorbikes.  
Developing open-source software for the biomedical scientific community.  
Designing and building integrated hardware-software solutions to common problems.

**Languages** Italian, English, Spanish

**VISA Status** Current: H-1B (non-immigrant work permit)  
Pending: EB-1 (application for permanent residency/green card)

## REFERENCES

### Mary B. Kennedy, Ph.D.

*Allen and Lenabelle Davis Professor of Biology*  
Division of Biology  
California Institute of Technology  
M/C 216-76  
Pasadena, CA 91125 (USA)  
☎ +1-626-395-3923  
✉ [kennedym@its.caltech.edu](mailto:kennedym@its.caltech.edu)

### Nancy S. Wexler, Ph.D.

*President of the Hereditary Disease Foundation*  
*Higgins Professor of Neuropsychology*  
Departments of Neurology and Psychiatry of the College of Physicians and Surgeons  
Columbia University  
1051 Riverside Drive, Unit 6, PI Annex 371  
New York, NY 10032 (USA)  
☎ +1-212-543-5667  
✉ [wexlern@pi.cpmc.columbia.edu](mailto:wexlern@pi.cpmc.columbia.edu)

### Jacqueline E. Lee, Ph.D.

*Director*  
Cell Therapy Research · Diabetes  
Regenerative Medicine  
Geron Corporation  
230 Constitution Drive  
Menlo Park, CA 94025 (USA)  
☎ +1-650-566-7244  
✉ [jlee@geron.com](mailto:jlee@geron.com)

**Lynn A. Raymond, M.D., Ph.D.**

*Professor*

Department of Psychiatry, Division of Neuroscience & Brain Research Centre

University of British Columbia

4N3-2255 Wesbrook Mall Vancouver, BC V6T 1Z3 (CAN)

☎ +1-604-822-0723

✉ [lynmr@interchange.ubc.ca](mailto:lynmr@interchange.ubc.ca)