24TH WORLD CONGRESS OF DERMATOLOGY MILAN 2019

CATTANEO ELENA

Department of Biosciences, University of Milano, Italy

Born in Milano, Italy, in 1962. Married. Two children.

Education & Training

- Laurea Degree in Pharmacy (summa cum laude), University of Milano
- PhD in Biotechnology Applied to Pharmacology, University of Milano
- Post-Doctoral Fellow, Department of Brain and Cognitive Sciences (Prof. R. McKay lab) M.I.T., Cambridge USA
- Research stage at the University of Lund, (Prof. A. Björklund lab)

Academic appointments

- Assistant Professor of Pharmacology, University of Milano, 1995
- Associate Professor of Pharmacology, University of Milano, 2001
- Full Professor of Pharmacology, University of Milano, since 2003

At a glance

Elena Cattaneo is the director of the "Laboratory of Stem Cell Biology and Pharmacology of Neurodegenerative Diseases" at the Department of Biosciences (www.cattaneolab.it) as well as cofounder and first appointed Director of UniStem (www.unistem.it), the Centre for Stem Cell Research of the University of Milano.

The main research theme of her lab is the molecular pathophysiology of Huntington's Disease (HD). In particular, the laboratory aims at exploiting the recent advances in embryonic and induced stem cell biology to obtain the medium-sized spiny striatal neurons that degenerate in HD, as they would represent an important tool for disease modelling and to study early pathogenic aspects. On the other hand, the lab is pursuing a detailed characterization of the function of the HD gene in health and disease and has identified a number of molecular pathways targeted by the gene. The lab's ultimate goal is to identify cells, molecules and pathways that are suitable for therapeutic intervention and new reagents for drug screening in Huntington's Disease.

The lab is composed of 20 scientists and includes an internal management.

Over the years, funders of the Cattaneo's lab included the Huntington's Disease Society of America (USA), the Hereditary Disease Foundation (USA), the CHDI Foundation (USA), the European Commission (through EuroStemCell, ESTOOLS, NeuroNE, STEM-HD, Stemstroke, Neuromics, Neurostemcell, Neurostemcellrepair, JPND CircProt and Model PolyQ, ERC advanced projects), the Ministry of Research and University (Italy), Fondazione Cariplo (Italy), Fondazione Telethon (Italy). E. Cattaneo has recently acted as coordinator of the EU project Neurostemcell (2008-2013) and

Neurostemcellrepair (2013-2017). She is currently coordinating an Italian network on stem cells for Huntington's Disease funded by the Ministry of Research and University (2017-2020).

E. Cattaneo is Professor of Pharmacology at the Department of Biosciences of the University of Milano. Cattaneo held several, including "Stem Cells in Pharmacology and in Regenerative Medicine" at the University of Milan. Due to her recent appointment as Senator for Life, starting from September 2013 she can no longer be entitled of courses, but she continues teaching in the context of other courses held by the Professors of the Department and courses held at other Italian higher education entities.
She has been tutoring 22 PhD students (Doctorate programme) and more than 90 undergraduate students for the preparation of their experimental thesis (Master Degree).

She has given more than 400 lectures as an invited speaker at meetings and at seminars in various research institutions in the world. She is also active in organizing professional development and outreach events - for both the scientific community and lay public.

Funding (last 5 years)
First research awards: European Science Foundation (Twinning grant for collaborative research, 1991); Nato-Collaborative research Grant (1992); Research grant from the Hereditary Disease Foundation (USA, 1993), the Alzheimer's Association (USA, 1994), Telethon (Italy, 1995).
During the last five years she has been:

- 2008-2012 PI in EuroSyStem (www.eurosystemproject.eu EU, FP7)
- 2008-2013 Coordinator and PI of NeuroStemcell (www.neurostemcell.org EU, FP7) to study neural stem cell differentiation and transplantation in HD
- 2012-2014 Granted from the CHDI Foundation (USA) to study the in vivo impact of a cholesterol
- dysfunction in Huntington's Disease
- 2012-2016 PI in Neuromics (http://www.rd-neuromics.eu/, EU, FP7)
- 2012-2014 Joint Steering Committee Grant with CHDI Foundation (NY) to model striatal differentiation in vitro
- 2012-2014 Granted from Telethon (Italy) to study the mechanism of cholesterol dysfunction in HD
- 2013-2016 Coordinator of PRIN project (Italy) to study the biology and efficacy of stem cell grafts in HD
- 2013-2017 Coordinator and PI of Neurostemcellrepair (http://www.neurostemcellrepair.org EU, FP7) to study in vivo neural stem cell differentiation and integration in PD and HD
- 2016 2017 Joint Steering Committee Grant with CHDI Foundation (NY) on HD Biology
- 2016-2019 Partner of Model PolyQ Project (EU Joint Programme JPco-fuND H2020), to develop advanced models of polyglutamine disorders.
- 2016-2019 Partner of CircProt Project (EU Joint Programme JPco-fuND H2020), to study synaptic circuit protection in Alzheimer Disease and Huntington's Disease
- 2017-2020 Coordinator of PRIN project (Italy) to study the biology and efficacy of stem cell grafts in HD
- 2017-2022 PI of ERC Advanced Grant HD-Dittograph

Awards

- 2001 Le Scienze Prize for Medicine
- 2001 Gold Medal from the President of the Italian Republic, for her studies on neural stem cells and Huntington's Disease
- 2005 Marisa Bellisario Prize (Italy)
- 2005 Chiara D'Onofrio Prize (Italy)
- 2008 Grande Ippocrate Prize "Medical researcher of the year" for contribution to public outreach and dissemination on stem cells, honored by Unamsi (federation of Italian science journalists) and Novartis Pharma
- 2012 Awarded with Premio Tartufari Prize, Accademia dei Lincei, Rome
- 2012 Ambrogino D'Oro from the District of Milano, Italy
- 2013 EMBO member
- 2013 Member of Academia dei Lincei, Rome, Italy
- 2014 Public Service Award, International Society for Stem Cell Research (USA)
- 2015 "Il Caduceo d'Oro" Prize, Bari
- 2015 Gentile da Fabriano national prize, XIX edition
- 2015 Assobiotech Award 2015
- 2015 School of Advanced Studies Award, Camerino
- 2016 Simpatia Prize for medicine, research and university

Nominations & Roles in the community

- 2000-2001 Elected Member of the Senate of the University of Milano
- 2002-2006 Appointed by the Ministry of the University, Member of the Italian Delegation for Genomics and Biotechnology at the European Union (FP6)
- 2006 Knighted (Cavaliere Ufficiale) by the Presidency of the Italian Republic
- 2006 Member of the European Dana Alliance for the Brain
- 2007 Appointed by the Presidency of the Italian Republic Member and VicePresident of the National Bioethics Committee - resigned in 2008
- 2007 Appointed, by the Ministry of University and Research (Italy), member of the Committee for the selection of the President of the italian CNR
- 2008 Appointed, by the Ministry of University and Research (Italy), member of the National Committee for the Programme Rientro Cervelli (funds to be allocated to Italian scientists abroad returning to the country)
- 2008 Member of ISSCR Task Force for Clinical Translation of Stem Cell Research, USA
- 2009 Member of ISSCR Task Force on Unproven Stem Cell Therapies, USA
- 2012 Member of ISSCR Task Force on Legislative Educational Initiative, USA
- 2013 Committee member for the selection of the Director of CNR Institutes, Roma
- 2013 Committee member for the selection of the president of Anton Dohrn Zoology Institute, Ministero dell'Istruzione, dell'Università e della Ricerca, Roma
- 2013 Senator for life of Italian Republic appointed by the President Giorgio Napolitano, Roma

Invited presentations to peer reviewed internationally established conferences

- 2004 Presidential Lecturer, American Society for Neuroscience, San Diego
- 2007 Lecturer at the Keystone Symposia on Molecular Mechanisms of Neurodegeneration, USA
- 2008 Plenary Lecturer at the Federation for European Neuroscience (FENS) meeting, Geneve
- 2009 Plenary Lecturer at the International Society for Stem Cell Research (ISSCR), Barcelona
- 2009 Lecturer at the Conference in honor of the 100 years of Prof. Rita Levi-Montalcini
- 2009 Lecturer at the World Congress on Huntington's Disease, Vancouver
- 2010 Plenary Lecturer, Euroscience Open Forum (ESOF), Torino, Italy
- 2013 Plenary Lecturer at the International Society for Stem Cell Research (ISSCR), Boston
- 2014 Plenary Lecturer at the Federation for European Neuroscience (FENS) meeting, Milano, Italy
- 2015 Lecturer at the Gordon Research Conference, Lucca, Italy
- 2017 Lecturer at the Keystone Symposia, Olympic Valley, California (USA)

Advisory and Editorial Boards

- 1997-2008 "Coalition for the Cure" Investigator and since 2005 Coordinator of the "Huntingtin Function Team" of the Huntington's Disease Society of America (H.D.S.A.)
- Member of the Board of Directors of several European Consortia (Eurostemcell, NeuroNE, Neuromics) and of the Scientific Advisory Board of the Hereditary Disease Foundation (2010)
- 2006, active in the foundation and constitution of the Euro-HD network, a European consortium supported by the HighQ Foundation and aimed at strengthening clinical studies in HD in Europe
- Member of the Editorial Board of Journal of Biological Chemistry (2005-2009), Neurobiology of Disease (2005), Neuroscience (2006-2011), Progress in Neurobiology (2006)
- Acting as a reviewer for several journals (Science, Nature Neuroscience, Nature Genetics, J. Neuroscience amongst others)
- Acting as a reviewer for several funding agencies (DFG, Germany; Swiss National Foundation; Hereditary Disease Foundation; Austrian National Programmes; National Research Foundation, Singapore; Association Francoise Medical; European Commission)
- Acting as panel member/reviewer for academic positions worldwide (Imperial College London; Harvard Medical School; King's College London; Univ. of California-Irvine; Fred Hutchinson Cancer Center; Karolinska Institute; Univ. of Lund; EPFL, Lausanne)

Organization of Meetings and Science Communication

Elena Cattaneo is strongly committed to dissemination and public understanding of science through:

a) *the organization of International and National Scientific Meetings*
   - since 2003, co-organizer of the International Meeting "Molecular Mechanisms of Neurodegeneration", held in Milano every two year. In 2015 took place the sixth edition (400 scientists from all over the world attending)
   - Co-organizer of the World Congress for Freedom on Scientific Research, 2006; 2008
   - Co-founder of the Group of Italian Scientists for Research on Human Embryonic

Stem Cells (IES group) and co-organizer of an annual public event in Rome on the topic, 2007-2009

b) UniStem activities

Co-founder and Director since 2006 of UniStem (www.unistem.it), Centre for Stem Cell Research of the University of Milano, with main effort towards dissemination and outreach. Every year, she takes the responsibility for collecting the necessary funds, planning, and organizing several UniStem events including two scientific workshops (in Italian) free and open to all scientists and PhD students (attendees ~200); two Keynote Lectures, (attendees ~250); a one-day national event dedicated to high school students and currently involving more than 70 Universities and ~25k students in Europe. Since 2013 the event has become international with participation of Universities from Denmark, Hungary Ireland, Germany, Serbia, Spain, UK and Sweden.

c) Outreach & Dissemination

She has lectured on public policies to left and right political assemblies. She is active with HD patients organizations. She contributes to public education with newspaper editorials (5-10 per year, mostly on stem cells, brain diseases, academic freedom, science & society issues) and occasional appearances on TV and, more frequently, radio (5-10 per year). She is also frequently requested to provide insights on the main Italian newspapers (La Repubblica, Corriere della Sera, Il Sole 24 Ore, La Stampa) over the complex relationships between science, politics and society.

Publication

She has published >160 papers in peer-reviewed journals (including Science, Nature, Nature Genetics, Nature Neuroscience, Journal of Neuroscience, JBC). Her H index is 54.

Selection of the 20 most relevant peer-reviewed publications (from 2000):

1. Faedo A., Laporta A., Segnali A., Galimberti M., Besusso D., Cesana E., Belloli S., Moresco RM, Tropiano M., Fucà E., Wild S., Bosio A., Vercelli AE, Biella G. & Cattaneo E. (2017) Differentiation of human telencephalic progenitor cells into MSNs by inducible expression of Gsx2 and Ebf1. **Proceedings of the National Academy of Sciences USA**, 114(7), E1234-E1242
2. Valenza M., Chen J Y, Di Paolo E., Ruozi B., Belletti D., Ferrari Bardile C., Leon V., Claudio Caccia C.4, Elisa Brilli E., Stefano Di Donato S., Marina M Boido MM, Vercelli A., Vandelli M.A., Forni F., Cepeda C., Levine M.S., Tosi G., Cattaneo E. (2015) Cholesterol-loaded nanoparticles ameliorate synaptic and cognitive function in Huntington's disease mice**. EMBO Molecular Medicine**, 7 (12), 1547–1564
3. Onorati M., Castiglioni V., Biasci D., Cesana E., Menon R., Vuono R., Talpo F., Goya R.L., Lyons P.A., Bulfamante G.P., Muzio L., Martino G., Toselli M., Farina C., Barker R.A., Biella G., Cattaneo E. (2014) Molecular and Functional Definition of the Developing Human Striatum. **Nature Neuroscience**; (12): 1804-15.
4. Crotti A., Benner C., Kerman BE., Gosselin D., Lagier-Tourenne C., Zuccato C., Cattaneo E., Gage FH., Cleveland DW., Glass CK. (2014) Mutant Huntingtin promotes autonomous microglia activation via myeloid lineage-determining factors. **Nature Neuroscience**; 513-21.
5. Delli Carri A., Onorati M., Spaiardi P., Lelos M. J., Castiglioni V., Faedo A., Vuono R., Barker R. A., Dunnett S. B., Biella G., Cattaneo E. Developmentally coordinated extrinsic signals drive human pluripotent stem cell differentiation towards fully functional DARPP-32 medium sized spiny neurons. **Development**, 2013, 140, 301-312

6. Lo Sardo V., Zuccato C., Gaudenzi G., Vitali B., Ramos C., Tartari M., Myre M. A., Walker J. A., Pistocchi A., Conti L., Valenza M., Drung B., Schmidt B., Gusella J., Zeitlin S., Cotelli F., Cattaneo E. An evolutionary recent cell adhesion function for huntingtin in neuroepithelial cells implicates ADAM10-Ncadherin. **Nature Neuroscience**, 2012, 15, 713-21
7. Zuccato C., Valenza M, and Cattaneo E. (2010) Molecular mechanisms and potential therapeutical targets in Huntington's Disease. **Physiological Reviews** 90:905-81
8. Conti L., Cattaneo E., (2010) Neural stem cell systems: physiological players or in vitro entities? **Nature Rev Neurosci**, 11, 176-187
9. Valenza M, Leoni V, Karasinska JM, Petricca L, Fan J, Carroll J, Pouladi MA, Fossale E, Nguyen HP, Riess O, MacDonald M, Wellington C, DiDonato S, Hayden M, Cattaneo E. (2010) Cholesterol defect is marked across multiple rodent models of HD and is manifest in astrocytes **Journal of Neurosci**. 30, 10844-50
10. Zuccato C, Cattaneo E. (2009) Brain-derived neurotrophic factor in neurodegenerative diseases. **Nature Reviews Neurology**, 5, 311-322
11. Tartari M., Gissi C., Lo Sardo V., Zuccato C., Picardi E., Pesole G., Cattaneo E. (2007) Phylogenetic comparison of huntingtin homologues reveals the appearance of a primitive poly Q in sea Urchin. **Molecular Biology and Evolution** 25, 330-338
12. Zuccato C., Belyaev N., Conforti P., Ooi L., Tartari M., Papadimou E., MacDonald M., Fossale E., Zeitlin S., Buckley N., Cattaneo E. (2007) Widespread disruption of REST/NRSF occupancy of its target genes in Huntington's Disease. **Journal of Neuroscience**, 27, 6972-6983
13. Cattaneo E., Zuccato C. and Tartari M. Normal huntingtin function. **Nature Reviews Neuroscience**. (2005), 6, 919-930
14. Valenza M, Rigamonti D, Goffredo D, Zuccato C, Fenu S, Jamot L, Strand A, Tarditi A, Woodman B, Racchi M, Mariotti C, Di Donato S, Corsini A, Bates G, Pruss R, Olson JM, Sipione S, Tartari M, Cattaneo E. (2005) Dysfunction of the cholesterol biosynthetic pathway in Huntington's disease. **Journal of Neurosci**. 25, 9932-9
15. Zuccato C., Tartari T., Crotti C., Goffredo D., Valenza M., Conti L., Cataudella T., Leavitt B. R., Hayden M. R., Timmusk T., Rigamonti D. and Cattaneo E. (2003) Huntingtin interacts with REST/NRSF to modulate the transcription of NRSE-controlled neuronal genes. **Nature Genetics**, 35, 76-83
16. Rossi F. and Cattaneo E. (2002) Neural stem cell therapy for neurological diseases: dreams and reality. **Nature Reviews Neuroscience**, 3, 401-409
17. Zuccato C., Ciammola A., Rigamonti D., Leavitt B.R., Goffredo D., Conti L., MacDonald M.E., Friedlander R.M., Silani V., Hayden M.R., Timmusk., Sipione S., and Cattaneo E. (2001) Loss of Huntingtin-Mediated BDNF Gene Transcription in Huntington's Disease, **Science**, 293, 493-498
18. Conti L., Sipione S., Magrassi L., Bonfanti L., Peschanski M., Haddad B., Pelicci P., Rigamonti D., Pelicci G. and Cattaneo E. (2001) Shc(s) signalling in differentiating neural progenitor cells, **Nature Neuroscience**, 4, 579-586
19. Cattaneo E., Rigamonti D., Zuccato C., Goffredo D., Squitieri F., Sipione S. (2001) Loss of normal huntingtin function: new developments in Huntington's Disease research. **Trends in Neuroscience** [Review], 24, 182-188.
20. Rigamonti R., Bauer J. H., De-Fraja C., Conti L., Sipione S., Sciorati C., Clementi E., Hackam A., Hayden M., Li Y., Ross C., Govoni S., Vincenz C. and Cattaneo E.. (2000) Wild-type huntingtin

protects from apoptosis Upstream of caspase-3. **Journal of Neuroscience**, 20, 3705-3713

Other publications – On science & society

- Zuccato C. and Cattaneo E. (2016), "The Paradox of Huntington's Disease", **Scientific American**, 315(2), 56-61
- Cattaneo E. and Corbellini G., "Stem cells: taking a stand against pseudoscience" (2014), **Nature**, 510, 333-335
- Bianco P., Cattaneo E., De Luca M., Pani L., "Stamina therapies: Let the record stand" (2014), **Nature**, 506,434
- Bianco P, Barker R, Brüstle O, Cattaneo E, Clevers H, Daley GQ, De Luca M, Goldstein L, Lindvall O, Mummery C, Robey PG, Sattler de Sousa E Brito C, Smith A. "Regulation of stem cell therapies under attack in Europe: for whom the bell tolls." (2013), **EMBO Journal**, 32, 1489-95
- In 2010, she helped in the planning of "Staminalia: a dream and a trial", a play based on philosopher Armando Massarenti's italian language book "Staminalia", see Nature 465, pag. 1012, 2010
- Cattaneo E., Garagna S., Cerbai E., "Italy's stem cell challenge gaining momentum"(2010), **Nature**, 463, pag. 729,
- Cattaneo E. and Corbellini G., "Science under Politics. An italian nightmare" (2010), **EMBO reports**, dec 10
- "Science and politics. An interview with Elena Cattaneo, Director of the Centre for Stem Cell Research at the University of Milano, Italy." (2010) **EMBO reports**, dec 3, 2010
- Cattaneo E., "Science, dogmas and the state" (2010), **Nature**, 456, 444-5, 2008

Books

Cattaneo E. (2016), "Ogni giorno. Tra Scienza e Politica" with Josè De Falco and Andrea Grignolio, (Mondadori), dealing with her experience as a researcher and senator for life at the Italian Senate, also reviewed in **Nature** (2016), 539, 492–493