Curriculum Vitae

Federico Benetti

Current Position: Research Scientist, ECSIN-European Center for the Sustainable Impact of Nanotechnology, Veneto Nanotech S.C.p.A., Rovigo, Italy

Education

2008

PhD degree in Molecular Physiology and Structural Biology at the University of Padova with a thesis entitled "Structural Studies on the C-terminal Domain of Human PMCA1b". Supervisor prof. Mariano Beltramini

2004

degree in Biological Sciences at the University of Padova with a thesis entitled "Copper Dysmetabolism and Degenerative Diseases". Supervisor prof. Benedetto Salvato

Courses of study, workshops and symposia

2012

XVI School of Pure and Applied Biophysics on "Multimodal Methods for Cell Imaging and Tracking", Venice, Italy

2011

XV School of Pure and Applied Biophysics on "Protein Stability and Pathways of Self-Assembly", Venice, Italy

2010

1. XIV School of Pure and Applied Biophysics on "Molecular Mechanisms of Neurodegeneration", Venice, Italy.
2. First NeuroIITScience Workshop IIT, Genova, Italy

2009

1. Summer School on Dopaminergic Neurons, Trieste, Italy.
2. 5th Summer School on Personalized Medicine "Nutrition and Health", Trieste, Italy.
3. 3rd International Symposium on "The New Prion Biology: Basic Science, Diagnosis and Therapy", Venice, Italy

2008

1. 4th Summer School on "Advanced topics in Biomedicine III", Trieste, Italy.
2. 1st International Workshop "Human and Animal TSE", Grado, Italy

2007

1. Symposium "New Challenges in Protein Science", Parma, Italy.
2. 1st International Workshop "Proteins at Work", Perugia, Italy.
3. XI School of Pure and Applied Biophysics on "Advanced Optical Microscopy Methods in Biophysics", Venice, Italy

2006

School on "The Stochastic Processes and their Applications to Biology", Padova, Italy

2005

1. School P2P on "Predicting the structure and function of proteins", Padova, Italy.
2. Synchrotron Light National School (8th course), Rome, Italy.
3. EMBL course on "BioXAS on metalloproteins and organism tissue", Hamburg, Germany.
4. VI Mass Spectrometry course, IPSO, Vitorchiano, Italy

Career history

2011-present

Senior Researcher at ECSIN-European Center for the Sustainable Impact of Nanotechnology, Veneto Nanotech S.C.p.A., Rovigo, Italy

2008-2011

Research assignment at Neurobiology Sector at the Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy

2005-2007

PhD student at the Department of Biology at University of Padova, Italy

Professional Activities

2012

1. Organizer of the International Workshop on "Essential metals in brain development and neurodegeneration", Trieste, Italy
2. Responsible for the FTIR project "FTIR microspectroscopy study of lipids and myelin lipids in the central nervous system of mice lacking PrP^{C}"

2011

1. Measurements of Differential Scanning Calorimetry and Circular Dichroism on mouse prion protein at

Department of Chemical Sciences, University of Catania, Catania, Italy.

2. Responsible for the SAXS project "A SAXS study of recombinant prion protein oligomers" at Elettra Synchrotron, Trieste, Italy

2010

1. Measurements of Differential Scanning Calorimetry and Electron Paramagnetic Resonance on mouse prion protein at Department of Chemical Sciences, University of Catania, Catania, Italy.
2. Chairman for the "Neurobiology of disease" session at 14th Young Neuroscientist meeting, Trieste, Italy.
3. Scientific Organizer of the International Workshop on "Fermentation Technology for Large Scale Protein Production", Trieste, Italy

2009

1. Responsible for the SAXS project "A SAXS study of recombinant prion protein oligomers" at Elettra Synchrotron, Trieste, Italy.
2. XAS measurements at the European Synchrotron Radiation Facility (ESRF) for the project, Grenoble, France

2008

Crystallization experiments on the human prion protein 90-231 at Blackett Laboratory of Imperial College, London, Great Britain

2007

SANS measurements at the Laboratoire Leon Brillouin for the project "Contrast variation SANS study of the conformation of C-terminal calcium ATPase upon interaction with allosteric effectors", Saclay, France

2006

Responsible for the SAXS project "SAXS analysis of the oligomerization process in the human Ca^{2+}-ATPase" at Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany

Other professional activities

Reviewer of several peer-reviewed international journals: Neuroscience Letters, American Journal of Biochemistry, Research in Neuroscience, Research in Cell Biology, Nanoscience and Nanotechnology.

Teaching Experience

2008-present

Co-supervisor of PhD students in Functional and Structural Genomics towards experimental thesis on

molecular biology, biochemistry, biophysics and physiology projects

2006-present

Co-supervisor of bachelor degree and master degree students towards experimental thesis on molecular biology, biochemistry and biophysics projects

2005-2006

Lecturer at the laboratory of integrated course of Physiology for Biology at University of Padova, Padova, Italy

Achieved Grants

2011-2012

Young SISSA Scientists Grant with the project "Transition metals and metal-binding proteins in neuroscience: from brain development to neurodegeneration" based on the following criteria: original and innovative contribution to the scientific knowledge of the Sector; scientific importance of the research project; technical or scientific merit of the methodology proposed and their congruity with respect to the objectives of the project. (35,000 €)

2008

SIBPA Grant to attend the Symposium "New Challenges in Protein Science", Parma, Italy

2007

Grant to attend the 1st International Workshop "Proteins at Work", Perugia, Italy

2006

Financial support for the SAXS project at DESY-Synchrotron, Hamburg, Germany

2005

1. SIBPA financial support to attend at Synchrotron Light National School (8th course), Rome, Italy.
2. EMBO financial support to attend the "BioXAS on metalloproteins and organism tissue course", Hamburg, Germany

Conferences

2012

1. International Conference "NanotechItaly 2012", Venice, Italy.
2. 6th International Conference on Nanotoxicology "Nanotoxicology 2012", Beijing, China.
3. Prion2012 International Congress, Amsterdam, The Netherlands

2011

4th International Conference "NanotechItaly 2011", Venice, Italy

2010

Prion2010 International Congress "Form Agent to Disease", Salzburg, Austria

2009

Prion2009 International Congress "Transmissible Spongiform Encephalophaties", Chalkidiki, Greece

2007

14th Congress on "Calcium Binding Protein and Calcium Function in Health and Disease", La Palma, Spain

Selected contributions in workshops and conferences

2012

1. Toward the Identification of the Structural Determinants of Prion Conversion. First Iberian Congress on Prions (Santiago de Compostela, Spain).
2. *In vitro* cytotoxicity cobalt nanoparticles. NanotechItaly2012 (Venice, Italy).
3. Size-dependent effects of uncoated silver nanoparticles on human alveolar basal epithelial cell line A549. NanotechItaly2012 (Venice, Italy).
4. ECSIN and the research project Silver Nanoparticles: a set of in vitro assays for the evaluation of the nanotoxicological effects induced by exposure to Silver Nanoparticles. Nanotoxicology 2012 congress (Beijing, China) and XI National Congress of Biotechnology (Varese, Italy).
5. Effects of the pathological Q212P mutation on human prion protein non-octarepeat copper binding site. Prion2012 congress (Amsterdam, The Netherlands).
6. Cellular Prion Protein: Role in Excitotoxicity and Metal Ions Homeostasis. Prion2012 congress (Amsterdam, The Netherlands) and International Symposium on "Biology and Translational Aspects of Neurodegeneration" (Venice, Italy).
7. Role of Prion Protein Accumulation in Lipid Rafts During Aging. KEYSTONE SYMPOSIA on Molecular and Cellular Biology (Tokyo, Japan)

2011

1. Description and Characterization of a Highly Stable Enthalpic Intermediate State in Mouse Prion Protein Folding. Prion2011 congress (Montreal, Quebec, Canada).
2. NMR Structures of the Human Prion Protein with Pathological Mutations: Insights Into Molecular Basis of Prion Disease. Prion2011 congress (Montreal, Quebec, Canada).
3. Folding and Stability of Mouse Prion Proteins. XV School of Pure and Applied Biophysics (Venice, Italy)

2010

1. Insights into prion protein stability. Prion2010 congress (Salzburg, Austria).
2. Structural insights into prion protein stability and their implications for prion formation. First NeuroIITScience Workshop IIT (Genova, Italy).

3. Gene expression profiling to identify druggable targets in prion diseases. FENS Forum 2010 (Amsterdam, The Netherlands)

2009

1. Insights on neurotoxicity mechanism of Cuprizone. International Symposium on "The New Prion Biology: Basic Science, Diagnosis and Therapy" (Venice, Italy).
2. A structural characterization of recombinant mouse prion protein amyloid fibers. International Symposium on "The New Prion Biology: Basic Science, Diagnosis and Therapy" (Venice, Italy).
3. Molecular properties of the C-terminal domain of human plasma membrane Ca^{2+}-ATPase. Neutrons in Biology congress (Lund, Sweden).
4. Insights on neurotoxicity mechanism of Cuprizone. 5th Summer School on Personalized Medicine "Nutrition and Health" (Trieste, Italy)

2008

Is the oligomerization of Plasma Membrane Calcium ATPase a reversible process? (A new approach to study the oligomerization phenomena). 4th Summer School on "Advanced topics in Biomedicine III" (Trieste, Italy)

2007

Effect of Sodium Dodecyl Sulphate on the aggregation state of PMCA1b C-terminal domain. 14th Congress on "Calcium Binding Protein and Calcium Function in Health and Disease" (La Palma, Spain)

2006

Expression and structural characterization of the C-terminal domain of Plasma Membrane Calcium ATPase 1b. 57th Conference of Italian Society of Physiology (Ravenna, Italy)

Deposited sequences and structures

Ilc, G., Giachin, G., Jaremko, M., Jaremko, Ł., **Benetti, F.**, Plavec, J., Zhukov, I., Legname, G. (2010). Three dimensional structure of HuPrP(90-231 M129 Q212P). PDB ID: 2KUN

Benetti,F., Cappellini, R., Beltramini, M. (2007). Homo sapiens partial mRNA sequence for ATPase, Ca^{2+} transporting, plasma membrane 2 (ATP2B2 gene) splice variant 2a. Accession number: AM491813

Invited presentations

2010

Prions seen with SAXS. Small Angle XmaS Workshop (Trieste, Italy)

2009

SAXS Analysis Of PrP^{Sc} And Oligomeric Recombinant Mouse PrP(89-230). Prion2009 congress (Chalkidiki, Greece)

2009

Insights on neurotoxicity mechanism of Cuprizone. 5th Summer School on Personalized Medicine "Nutrition and Health" (Trieste, Italy)

2008

Small Angle Neutron Scattering; a new approach to study the oligomerization phenomena in multiphasic systems. 4th Summer School on "Advanced topics in Biomedicine III" (Trieste, Italy)

2007

Are acidic phospholipids the trigger for the increase of intracellular calcium concentration after a stimulus? 1st International Workshop "Proteins at Works" (Perugia, Italy)

Prizes and Awards

2009 Registered in the Gold Book of I.T.I.S. Primo Levi (Venice, Italy)

14/01/2013 Federico Beretti

Federico Benetti Publications in peer-reviewed journals

¶,*D'Angelo, P., Della Longa, S., Arcovito, A., Mancini, G., Zitolo, A., Chillemi, G., Giachin, G., Legname, G., **Benetti, F.** (2012). Effects of the Pathological Q212P Mutation on Human Prion Protein Non-Octarepeat Copper-Binding Site. Biochemistry, 51(31), 6068-79. doi:10.1021/bi300233n

¶Didonna, A., Sussman, J., **Benetti, F.**, Legname, G. (2012). The role of Bax and caspase-3 in doppel-induced apoptosis of cerebellar granule cells. Prion, 6(3), 309-16. doi:10.4161/pri.20026

¶**Benetti, F.**, Gustincich, S., Legname, G. (2012). Gene expression profiling and therapeutic interventions in neurodegenerative diseases: a comprehensive study on potentiality and limits. Expert opinion on drug discovery, 7(3), 245-59. doi:10.1517/17460441.2012.659661. Cited by 2

***Benetti, F.**, Mičetić, I., Carsughi, F., Spinozzi, F., Bubacco, L., Beltramini, M. (2011). Insights into the oligomerization process of the C-terminal domain of human plasma membrane Ca2+-ATPase. Archives of biochemistry and biophysics, 506(2), 194-200. doi:10.1016/j.abb.2010.11.017

¶,*Natalello, A., **Benetti, F.**, Doglia, S. M., Legname, G., Grandori, R. (2011). Compact conformations of α-synuclein induced by alcohols and copper. Proteins, 79(2), 611-21. doi:10.1002/prot.22909. Cited by 7

¶Ilc, G., Giachin, G., Jaremko, M., Jaremko, Ł., **Benetti, F.**, Plavec, J., Zhukov, I., Legname, G. (2010). NMR structure of the human prion protein with the pathological Q212P mutation reveals unique structural features. PloS one, 5(7), e11715. doi:10.1371/journal.pone.0011715. Cited by 15

¶**Benetti, F.**, Geschwind, M. D., Legname, G. (2010). De novo prions. F1000 biology reports, 2(June), 4-7. doi:10.3410/B2-46. Cited by 2

¶,***Benetti, F.**, Ventura, M., Salmini, B., Ceola, S., Carbonera, D., Mammi, S., Zitolo, A., D'Angelo, P., Urso, E., Maffia, M., Salvato, B., Spisni, E. (2010). Cuprizone neurotoxicity, copper deficiency and neurodegeneration. Neurotoxicology, 31(5), 509-17. Elsevier B.V. doi:10.1016/j.neuro.2010.05.008. Cited by 5

¶**Benetti, F.**, Gasperini, L., Zampieri, M., & Legname, G. (2010). Gene expression profiling to identify druggable targets in prion diseases. Expert opinion on drug discovery, 5(2), 177-202. doi:10.1517/17460440903544449. Cited by 2

¶Latawiec, D., Herrera, F., Bek, A., Losasso, V., Candotti, M., **Benetti, F.**, Carlino, E., Kranjc, A., Lazzarino, M., Gustincich, S., Carloni, P., Legname, G. (2010). Modulation of alpha-synuclein aggregation by dopamine analogs. PloS one, 5(2), e9234. doi:10.1371/journal.pone.0009234. Cited by 14

¶**Benetti, F.**, Legname, G. (2009). De novo mammalian prion synthesis. Prion, 3(4), 213-9. doi:10.4161/pri.3.4.10181. Cited by 4

¶Polano, M.#, Bek, A.#, **Benetti, F.#**, Lazzarino, M., Legname, G. (2009). Structural insights into alternate aggregated prion protein forms. Journal of molecular biology, 393(5), 1033-42. Elsevier Ltd. doi:10.1016/j.jmb.2009.08.056. Cited by 8

 # first co-authors

Book Chapters

¶Legname, G., Giachin, G., **Benetti, F.** (2012). Structural Studies of Prion Proteins and Prions. In: Non-Fibrillar Amyloidogenic Protein Assemblies - Common Cytotoxins Underlying Degenerative Diseases. p. 289-318, ISBN: 978-94-007-2773-1, doi: 10.1007/978-94-007-2774-8. Cited by 1

Beltramini, M., **Benetti, F.** (2008). Excretion. In Sven Erik Jørgensen and Brian D. Fath (Editor-in-Chief), Ecological Processes. Vol. [2] of Encyclopedia of Ecology, 5 vols. pp. [1485-1498] Oxford: Elsevier

Conferences proceedings

Lisa Bregoli, **Federico Benetti**, Marco Venturini, Enrico Sabbioni (2012). ECSIN's methodological approach for hazard evaluation of engineered nanomaterials. Journal of Physics: conference series. *In press*

¶**Benetti, F.**, Della Longa, S., Arcovito, A., Mancini, G., Zitolo, A., Chillemi, G., Giachin, G., Legname, G., D'Angelo, P. (2012). Effects of the pathological Q212P mutation on human prion protein non-octarepeat copper binding site. Prion 6(Supplement), 76-87

¶Gasperini, L., Legname, G., **Benetti, F.** (2012). Cellular prion protein: Role in excitotoxicity and in metal ions homeostasis. Prion 6(Supplement), 113-127

¶Giachin, G., Ilc, G., **Benetti, F.**, Plavec, J., Zhukov, I., Legname, G. (2011). NMR Structures of the Human Prion Protein with Pathological Mutations: Insights Into Molecular Basis of Prion Disease. Prion 5(Supplement), 21-97

¶**Benetti, F.**, Biarnés, X., Attanasio, F., Rizzarelli, E., Laio, A., Legname., G. (2011). Description and Characterization of a Highly Stable Enthalpic Intermediate State in Mouse Prion Protein Folding. Prion 5(Supplement), 21-97

¶**Benetti, F.**, Pastorino, L., Attanasio, F., Rizzarelli, E., Legname, G. (2010). Insights into Prion Protein Stability. Prion 4(3), 121.

Deposited sequences and structures

¶Ilc, G., Giachin, G., Jaremko, M., Jaremko, Ł., **Benetti, F.**, Plavec, J., Zhukov, I., Legname, G. (2010). Three dimensional structure of HuPrP(90-231 M129 Q212P). PDB ID: 2KUN

Benetti,F., Cappellini, R., Beltramini, M. (2007). Homo sapiens partial mRNA sequence for ATPase, Ca^{2+} transporting, plasma membrane 2 (ATP2B2 gene) splice variant 2a. Accession number: AM491813

¶ publications without PhD supervisor (prof. Mariano Beltramini)

*** representative publications**

14/01/2013 Federico Benetti

Federico Benetti Qualification

2012

Co-supervisor of PhD thesis "Metal ion regulation in the central nervous system and in glutamatergic synapses: role of the cellular prion protein" (SISSA)

2012

Organizer of the Workshop "Essential metals in brain development and neurodegeneration" (SISSA)

2011-2012

Young SISSA Scientists Grant with the project "Transition metals and metal-binding proteins in neuroscience: from brain development to neurodegeneration"

2009-2010

Co-supervisor of the following master degree theses:

1. Insights into the chemical and thermal stability of mouse prion protein (SISSA-University of Trieste)
2. Full-length and truncated murine prion proteins: cloning, expression and characterization of two chimeric proteins for single molecule force spectroscopy studies (SISSA-University of Bologna)
3. Folding and stability of mouse prion proteins (SISSA-University of Trieste)

2008

PhD thesis entitled *Structural Studies on the C-terminal Domain of Human PMCA1b* (Plasma Membrane Calcium ATPase, isoform 1b) (University of Padova)

2005-2007

Co-supervisor of the following bachelor degree theses:

1. Purificazione e Caratterizzazione della Calmodulina umana espressa in *E. coli* (University of Padova)
2. Ottimizzazione della purificazione del dominio C-terminale della Ca^{2+}-ATPasi umana ed esperimenti di *binding* con la Calmodulina (University of Padova)
3. Clonaggio del Dominio C-terminale della variante di splicing a della Ca2+-ATPasi (University of Padova)
4. Clonaggio degli esoni caratterizzanti la variante di splicing umana 2w della Ca^{2+}-ATPasi (University of Padova)

2005-2006

Lecturer at the laboratory of integrated course of Physiology for Biology (University of Padova)

2005

EMBL course on *BioXAS on metalloproteins and organism tissue* (Hamburg, Germany)

2004

Master thesis entitled *Copper Dysmetabolism and Degenerative Diseases* (University of Padova)

14/01/2013 Federico Benetti