TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO **ID CODE 4439**

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di Biotecnologie Mediche e Medicina Traslazionale**

Scientist- in – charge: **Alessandro Prinetti, Professor and Laura Mauri, Dr**

[Elena Chiricozzi]

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Chiricozzi
Name	Elena
Date of birth	[14 Giugno 1981]

POSITIONS AND EMPLOYMENT

January 2017-now
Assistant Professor (RTDa) in Biochemistry (SC 05/E1 - SSD BIO/10)
Department of Medical Biotechnology and Translational Medicine, University of Milano, Segrate, Milano, Italy

October 2014-December 2016
PostDoc
Centre of Excellence on Neurodegenerative Disease, Department of Medical Biotechnology and Translational Medicine, University of Milano, Segrate, Milano, Italy
Advisor: Sandro Sonnino, Professor

June-October 2014
PostDoc
Cancer Gene Therapy Unit, Division of Molecular Oncology, San Raffaele Scientific Institute
Advisor: Vincenzo Russo, Dr

July 2013-June 2014
PostDoc
Laboratory of Cellular Adhesion, University of Vita e Salute San Raffaele, Milano, Italy
Advisor: Ivan De Curtis, Professor

EDUCATION

2010-2013
Biochemistry PhD student, University of Milano

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Centre of Excellence on Neurodegenerative Disease, Department of Medical Biotechnology and Translational Medicine, University of Milano, Segrate, Milano, Italy
Title of Thesis: Sphingolipids as signalling molecules: their involvement in health and disease
Thesis Advisor: Sandro Sonnino, Professor in Biochemistry

2005-2008
Master of Science in Medical Biotechnology, University of Perugia
110 (out of 110) cum laude
Title of Thesis: Correlation between group IIA secretory phospholipase A_2 (sPLA$_2$-IIA) activation and apoptosis in primary neuronal cells: effect of NMDA-receptor activation and oxidative stress
Thesis Advisors: Gianfrancesco Goracci, Professor in Biochemistry and Juan Pedro Bolaños, Professor in Biochemistry and Molecular Biology

2001-2005
Bachelor's Degree in Biotechnology, University of Perugia
108 (out of 110)
Thesis Advisor: Gianfrancesco Goracci, Professor in Biochemistry
Title of Thesis: Use of fluorescent substrates for the assay of phospholipases A_2 (PLA$_2$) *in vivo* and *in vitro*

EDUCATIONAL EXPERTISE

Courses taught or developed

Academic year 2018/2019 – 32 hours
Professor of Biochemistry module (SSD BIO/10), Course of Cell Molecules and Genes, International Medical School, University of Milano

Academic year 2017/2018 – 30 Hours
Professor of Biochemistry module (SSD BIO/10), Course of Cell Molecules and Genes, International Medical School, University of Milano

Academic year 2017/2018 – 12 Hours
Professor of Biochemistry module (SSD BIO/10), Course of Cell Molecules and Genes 2 and Function, International Medical School, University of Milano

Academic year 2012/2013 – 25 Hours
Tutor of Laboratorio di Biochimica (SSD BIO/10), Course of Esercitazioni di Laboratorio, Corso di Laurea Magistrale in Biotecnologie Mediche e Medicina Molecolare, University of Milano

Academic year 2012/2013 – 25 Hours
Tutor of Metodologie Cellulari e Molecolari (SSD BIO/10), Course of Laboratorio interdisciplinare di biotecnologie di base, Laurea Triennale in Biotecnologie Mediche, University of Milano

Academic year 2012/2013 – 6 Hours
Tutor of Bioinformatics course (SSD BIO/10), Elective activities, Corso di Laurea Magistrale in Biotecnologie Mediche e Medicina Molecolare, University of Milano

Internship and thesis supervisions

October 2018-now
Tutor of the PhD student Dr. Giulia Lunghi (Matr. R12092)
PhD in Biochemical Sciences, XXXIII cycle, University of Milano
Project Title: The oligosaccharide chain $II^3Neu5AcGg_4$ as neuronal regulator

October 2017-now
Tutor of the PhD student Dr. Erika Di Biase (Matr. R11775)
PhD in Biochemical Sciences, XXXII cycle, University of Milano
Project Title: Role of glycan chain of gangliosides in modulating the neuronal signaling processes

2015-2017
Tutor of the PhD student Dr. Margherita Maggioni (Matr. R10940)
PhD in Biochemical Sciences, XXX cycle, University of Milano
Title: GM1-mediated neurodifferentiation is promoted by OligoGM1-TrkA interaction

Academic year 2014/2015
Co-supervisor in the bachelor's degree thesis of Gabriele Patti (Matr. 818388)
Corso di Laurea Triennale in Biotecnologie Mediche, University of Milano
Title: Produzione della catena oligosaccaridica del ganglioside GM3 mediante espressione delle proteine ricombinanti CMP-Neu5Ac sintetasi e α-2,3-sialiltransferasi in Escherichia coli.

Academic year 2014/2015
Co-supervisor in the masters' degree thesis of Elena Ravizza (Matr. 845113)
Corso di Laurea Magistrale in Biotecnologie Mediche e Medicina Molecolare, University of Milano
Title: Catena oligosaccaridica del ganglioside GM1: ruolo nel differenziamento di cellule di neuroblastoma e produzione in cellule di Escherichia coli

Others

2018-now
Member of council of PhD program in Translational Medicine

Academic years 2018/2019 & 2017/2018
Reference teacher for the Biochemistry module in Cells Molecules and Genes 2 (CMG2), International Medical School, University of Milano

RESEARCH ACTIVITY

January 2017-now
Department of Medical Biotechnology and Translational Medicine, University of Milano, Italy (Assistant Professor – RTDa)
My research activity is now focusing on the neurotrophic and neuroprotective properties of ganglioside GM1 and its derivate (oligosaccharide portion of GM1 ganglioside, OligoGM1) in the nervous system. Several data suggest a specific role of ganglioside GM1 in neuronal differentiation and development, but the molecular mechanisms behind these processes are largely unknown. Recently, my team found that only the GM1 oligosaccharide, rather than the ceramide portion, is directly involved in these processes (Chiricozzi *et al* 2017 *J Neurochem;* Chiricozzi E. *et al* 2019 *Mol Neurobiol;* Chiricozzi *et al* 2019 *J Neurochem*). We found that GM1 modulates TrkA activity by stabilizing the TrkA-NGF complex with its oligosaccharide portion. The complex induces TrkA phosphorylation and MAPK-pathway activation triggering the differentiation and

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protection signalling. These findings provide a new view for the role of the oligosaccharide chain of gangliosides in plasma membrane signalling.
From here we developed the idea of impaired OligoGM1–plasma membrane protein interaction as main cause underling Parkinson's disease (PD) onset related to aged GM1 decline (Chiricozzi *et al*. under revision for *Scientific Reports*). We pointed out that the OligoGM1 systemically administered to PD mouse model completely rescues the physical impairment as well as the biochemical features reaching the healthy conditions.
This project is carried out in the framework of various national and international collaborations (Prof. Ivano Eberini, University of Milano, Italy; Prof. Nico Mitro, University of Milano, Italy; Prof. Gabriella Tedeschi, University of Milano, Italy; Prof. Elena Menegola, University of Milano, Italy; Prof. Fabien Gosselet, Université Artois, France; Prof. Robert Ledeen, Rutgers University, Newark, NJ, US; Prof. Maria Trinidad Herrero Ezquerro, University of Murcia, Spain; Dr. Tim Bartles, London College University, UK). We aim to dissect both the molecular mechanism underling the GM1 oligosaccharide properties as well as the therapeutic efficacy of GM1 oligosaccharide for the treatment of Parkinson's disease. The research conducted in these years regarding the properties of GM1 oligosaccharide led to the development of an Italian Patent (N° 102018000007093) "Oligosaccaridi per l'uso nel tratttamento della malattia di Parkinson – Oligosaccharide for the use in the treatment of the Parkinson's disease" presented by Prof. Sandro Sonnino and me, as inventors.

October 2014-December 2016
Department of Medical Biotechnology and Translational Medicine, University of Milano, Italy (PostDoc)
The efficacy of ganglioside GM1 has been proved for PD by clinical and preclinical trials. However, the limited bioavailability of ganglioside GM1 and the high risk of protein contamination when obtained from animal brains are two problems hampering the therapeutic use of GM1 for PD. The overall aim of this project was to develop a synthetic ganglioside GM1 by the enzymatic synthesis of the oligosaccharide portion of ganglioside GM1 by *E. coli* engineering, followed by chemical conjunction of the ceramide moiety. For the enzymatic production of OligoGM1, the strain *E. coli* JM109 (DE3) was selected because it is positive for lactose ($LacY^+$) and sialic acid ($NanT^+$) transporters and negative for the ß-gal ($LacZ^-$). Unfortunately, this strain is positive for the sialic acid aldolase (NanA), the enzyme responsible for the sialic acid degradation. Since sialic acid is one of the substrates for the OligoGM1 synthesis, the aldolase could affect OligoGM1 yield. For this reason, the NanA gene was deleted by using the λ red recombinase system. The 5 genes necessary for the OligoGM1 enzymatic synthesis [*i)* CMP-NeuAc-synthase; *ii)* Lst (α-2,3-sialyltranferase); *iii)* WbpP (UDP-GlcNAc C4 epimerase); *iv)* CgtA (ß-1,4-N-acetylgalactosaminyltransferase); *v)* CgtB (ß-1,3-galactosyltransferase)] were successfully synthesized by PCR. The five genes were cloned into a unique plasmid (BAC vector). In the near future, the *E. coli* JM109 (DE) $NanA^-$ strain will be engineered in order to obtain satisfactory quantities of OligoGM1 for a lab-scale production. This project was carried out in collaboration with Prof. Hirotada Mori, Nara Institute of Science and Technology (NAIST), Nara, Japan, where I worked from October 2016 to December 2016 as visiting PostDoc.

June-October 2014
Cancer Gene Therapy Unit, Division of Molecular Oncology, San Raffaele Scientific Institute (PostDoc)
The main goal of this research was to better define the role of oxysterols/LXRα in promoting tumor survival *in vitro*. In particular, we focused our attention on defining novel molecular mechanisms through which LXRα signalling may sustain tumor growth and on identifying molecular markers predicting sensitivity to LXRα signalling abrogation. In this contest, I characterized the mechanism by which LXRα signalling abrogation induces apoptosis through glycosphingolipid-derived ceramide in multiple myeloma cell lines (Chiricozzi *et al* 2015 *Glycoconj J*). The attention was focused on one of LXRα target genes, SREBP1c, a transcription factor regulating *de novo* lipogenesis, which is the main pathway used by cancer cells for the synthesis of new structural lipids. Both SREBP-1c and its target gene FASN are down regulated in LXRα-sensitive cells. Finally, in the LXRα-sensitive cells, an increase of apoptotic cell death was shown due to a

higher level of plasma membrane (PM) ceramide up to three times with respect to the insensitive cells. A reduction in ganglioside GM3 was found, suggesting that the produced ceramide came from the activity of the PM glycosidases, like sialidase neu3, ß-hex, ß-gal and ß-glu. These results suggested that in sensitive cells the reduction in *de novo* lipogenesis and fatty acids synthesis could be responsible for a reorganization of cell membrane which in turn could determine an increase in glycohydrolases activity at PM level with a production of pro-apoptotic ceramide. Interestingly, this pathway may represent a novel potential therapeutic target for multiple-myeloma and other type of tumors.

July 2013-June 2014
Laboratory of Cellular Adhesion, University of Vita e Salute San Raffaele, Milano, Italy (PostDoc)
Cell migration and invasion require the dynamic coordination of adhesion, actin organization, and membrane traffic at the leading edge of the cell. The major interest of the lab was to analyse the molecular mechanisms coordinating the protrusive activity at the edge of migrating cells and to characterize fundamental cellular mechanisms underlying cell motility events relevant to both physiological and pathological conditions. In this contest, my research activity was to define the role of Liprin ß, proposing a possible role as tumor suppression protein for Lipß2 in contrast with the role of onco-protein for Lipα1/Lipß1 (Chiaretti, Chiricozzi *et al* 2016 *Biol Cell*).

2010-2012
Department of Medical Biotechnology and Translational Medicine, University of Milano, Italy (PhD Student)
My research activity has been mainly focused on lipid biochemistry, and in particular on the involvement of the sphingolipids (SLs) in the regulation of the cell homeostasis. Indeed, I studied the role of SLs, and their derivatives in modulating cell surface properties thought the interaction with specific proteins that are associated with a peculiar plasma membrane (PM) macromolecular complex, called lipid rafts, involved in the regulation of the signal transduction. On the other hand, the attention was focused on their implication in several diseases ranging from neurodegenerative disorders to cancer.
The biochemical study on SLs started in collaboration with Juntendo University of Tokyo, where I spent 10 months working on a project aimed to understand the role of a specific glycosphingolipid called Lactosylceramide (LacCer) in modulating the cell signalling involved in neutrophils response upon bacterial infection (Chiricozzi *et al* 2015 *J Lipid Res*). Interestingly, it was found that a lipid raft protein, Lyn, which is associated to the cytoplasmatic layer of PM by a palmitoyl chain, has a direct interaction with a particular class of LacCer characterized by a long fatty acid chain inserted in the external layer of PM forming a chain-to-chain interaction directly in the hydrophobic core of cell plasma membrane.
During my PhD project, the research was oriented also on the study of two different sphingolipidoses. On one side, I analysed the lipid content in an animal model of Niemann-Pick Disease (Prinetti, Chiricozzi *et al*. 2011 *Neurochem R*). In this sphingolipidosis there is an accumulation of undegraded sphingomyelin (SM) in lysosome. Using mass spectrometry, I found in central nervous system that most of the accumulated SM contains a short fatty acid. Moreover, in this disease, it has been demonstrated an accumulation of GM2 and GM3 gangliosides in peripheral tissues as secondary alteration of lipid metabolism. From the other part, thanks to a collaboration between Paris University and Perugia University, I studied the effect of treatment with a pharmacological chaperone - Pyrimenthamine - on fibroblasts from two cases of juvenile Sandhoff disease, another sphingolipidosis caused by the accumulation of the ganglioside GM2 (Chiricozzi *et al*. 2013 *Mol Neurobiol*). Using *in vitro* enzymatic assay, I demonstrated that, after the administration of Pyrimethamine, the increase of the enzymatic activity of the defective enzyme ß-hex against the artificial substrate was an artefact. In fact, the same result was not obtained using the natural GM2 substrate. By the way, this negative result suggested the necessity of *in vitro* tests on the natural substrates and confirmed that biochemical analysis is pivotal in understanding the effect of therapeutic drugs.
Finally, I evaluated the implication of lipids in the process of neoplastic transformation (Aureli, Chiricozzi *et al*. 2012 *Glycoconj J*). I demonstrated that, in different tumor cell lines, the activity of some PM-associated glycohydrolases was increased after the treatment with ionizing radiations, inducing an increased

glycolipids catabolism at the PM level followed by the parallel increased production of apoptotic ceramide. These data suggest that the glycohydrolases associated with the cell surface could represent a new potential therapeutic target, because their modulation could increase the apoptotic effect, generated by the conventional radiotherapy, on the cancer cells.

2004-2009
Dep. of Internal Medicine, University of Perugia, Italy and Department of Biochemistry and Molecular Biology, University of Salamanca, Spain (Undergraduate Student)
My research experience started at the Department of Internal Medicine, University of Perugia during my undergraduate study (2004-2005 Bachelor Degree/2007-2009 Master Degree). Part of this research activity was carried out in the Laboratory of Professor Juan Pedro Bolaños, University of Salamanca, Spain. The research activity was focused on the study of the functions of phospholipases A_2 in neural cells and their involvement in brain dysfunctions. In particular, I developed an innovative methodology for assaying phospholipase A_2 activity *in vitro* and in living cells by the use of fluorogenic substrates (Chiricozzi *et al*. 2010 *J Neurochem*).

Collaborations

The research activity described above is implemented in the context of several national and international collaborations that allowed me to obtain a good degree of independence and large capability of discussion and contacts:

- Dr. Vincenzo Russo, Cancer Gene Therapy Unit, Division of Molecular Oncology, Department of Oncology, San Raffaele Scientific Institute, Milano, Italy
- Professor Ivano Eberini, Department of Pharmacological Sciences, University of Milano, Milano, Italy.
- Professor Kazuisha Iwabuchi, Institute for Environmental and Gender Specific Medicine, Juntendo University, Graduate School of Medicine, Tokyo, Japan
- Professor Catherine Caillaud, Institute Cochin, Université Paris Descartes, CNRS, Paris
- Professor Carla Emiliani, Department of Experimental Medicine and Biochemical Sciences, University of Perugia, Italy
- Professor Gosselet Fabien, Université Artois, EA 2465, Laboratoire de la Barrière Hémato-Encéphalique (LBHE), F-62300 Lens Cedex, France
- Professor Elena Menegola, Dipartimento di Bioscienze, Università degli Studi di Milano, Milano, Italia
- Professor Gabriella Tedeschi, Dipartimento di Medicina Veterinaria, Università degli Studi di Milano, Milano, Italia
- Dr. Massimo Aureli, Department of Medical Biotechnology and Translational Medicine, University of Milano, Italy
- Professor Nico Mitro, Department of Pharmacological Sciences, University of Milano, Milano, Italy
- Professor Hirotada Mori, Nara Institute of Science and Technology, NAIST, Nara, Japan
- Professor Maria Trinidad Herrero Ezquerro, University of Murcia, Murcia, Spain
- Dr. Tim Bartles, London College University, London, UK
- Dr. Michela Deleidi, Hertie Institute for Clinical Brain Research, Department of Neurodegenerative Disease, University of Tübingen, Germany
- Professor Luciano D'Adamio, Herbert C. and Jacqueline Krieger Klein Endowed Chair in Alzheimer's Disease and Neurodegeneration Research, New Jersey Medical School, Rutgers, The State University of New Jersey, Newark, NJ, US
- Professor Robert Ledeen, Rutgers University, Newark, NJ, US

International research activity .

November 2017-February 2018, January-March 2019
Visiting Researcher at the Rutgers University, Newark, NJ, USA in collaboration with Professor Robert Ledeen, Rutgers University, Newark, NJ, US
July 2017

Visiting Researcher at the Laboratoire de physiopathologie de la barrier hemato-encephalique, Université d'Artois, Lens, France, under the supervision of Professor Fabien Gosselet

November-December 2016
Visiting PostDoc at the NAIST, Nara Institute of Science and Technology, Nara, Japan under the supervision of Professor Hirotada Mori

April 2016
Visiting PostDoc at the Research Centre of FIDIA-Pharma, Noto, Siracusa, Sicilia, Italy

February 2015
Brain Blood Barrier (BBB) Training
Visiting PostDoc at the Laboratoire de physiopathologie de la barrier hemato-encephalique, Université d'Artois, Lens, France, under the supervision of Professor Cecchelli Romeo

February 2014
Visiting PostDoc at the Institute for Environmental and Gender Specific Medicine, Juntendo University, Graduate School of Medicine, Tokyo, Japan, under the supervision of Professor Kazuhisa Iwabuchi

July-August, 2012
Visiting PhD Student at the Institute for Environmental and Gender Specific Medicine, Juntendo University, Graduate School of Medicine, Tokyo, Japan, under the supervision of Professor Kazuhisa Iwabuchi

June 2012
Visiting PhD Student at the Department of Experimental Medicine and Biochemical Sciences, University of Perugia, Italy under the supervision of Professor Carla Emiliani

July-December, 2011
Visiting PhD Student at the Institute for Environmental and Gender Specific Medicine, Juntendo University, Graduate School of Medicine, Tokyo, Japan, under the supervision of Professor Kazuhisa Iwabuchi

January-May, 2008
Fellowship by "Leonardo da Vinci II Programme in Bioinformatic and Nano-Biotechnology (Bio-NANO)" at the Laboratory of Biochemistry and Molecular Biology, University of Salamanca, under the supervision of Professor Juan Pedro Bolaños

SCIENTIFIC PROJECTS: DIRECTION AND PARTECIPATION

Project: GM1 oligosaccharide efficacy in Parkinson's disease: a preclinical study
Role: PI
Partner: Prof. Robert Ledeen, Rutgers University, Newark, NJ, US
Description: The efficacy of ganglioside GM1 has been proved for Parkinson's disease (PD) by clinical and preclinical trials. *In vitro* and *in vivo* experiments showed that GM1 exerts neurotrophic functions by interacting with plasma membrane proteins throughout its oligosaccharide portion (OligoGM1).

Nevertheless, the effects exerted *in vitro* are largely lost *in vivo*, due to its amphiphilic properties that limit the passage through the blood brain barrier (BBB). Recently, in collaboration with Prof. Fabien Gosselet from Artois University (France), the PI pointed out the OligoGM1 ability to trick the BBB by a time-concentration dependent paracellular way using a human *in vitro* BBB model (Maggioni *et al*. 2018 *FEBS Open Bio*). Hence, to demonstrate the possibility for OligoGM1 to reach the brain, mice were systemically injected with tritium labeled OligoGM1 and, at different times after administration, its bio-distribution in different tissues was evaluated. Following intraperitoneal, intravenous or subcutaneous injections into mice, OligoGM1 was absorbed and taken up by various organs and tissues, including brain. The effect of the oligosaccharide portion of GM1 has been evaluated using the heterozygous B4galnt1$^{+/-}$ mouse. These mice characterized by half GM1 total amount respect to wild-type mice, develop all the features of sporadic PD: motor/cognitive impairment as well as by biochemical lesions [i.e. alpha-synuclein (αS) aggregates, death of dopaminergic neurons, etc]. It has been demonstrated that the B4galnt1$^{+/-}$ mice systemically treated for 4 weeks with OligoGM1 fully recovered the motor impairment and some of the biochemical features, such as reduction of αS aggregates, recovery of TH^{+} neurons in the *substantia nigra* and restore of striatum level of dopamine, dopac and norepinephrine (Chiricozzi *et al*. under revision for *Scientific Reports*). Now, we are evaluating the ability of OligoGM1 to rescue also the cognitive impairment and the biochemical features apart from those in the SN, considering central (i.e. cortex, hippocampus) but also peripheral (colon) tissues.
This project is running in collaboration with Prof. Robert Ledeen at the Department of Pharmacology, Physiology and Neuroscience, Rutgers University, Newark, NY, USA, where I worked as visiting researcher between 2017 and 2019.

Project: Elucidating the molecular mechanism underling αS aggregation occurring in Parkinson's Disease
Role: PI
Partner: Dr. Tim Bartels from London College University, Dementia Research Institute, London, UK
Description: A switch in the conformational properties of alpha-synuclein (αS) is hypothesized to be a key step in the pathogenic mechanism of αS aggregation in PD. The ß-sheet-rich state of αS has long been associated with its pathological aggregation in PD due to genetic modification that flank a specific domain (34-KEGVLYVGSKTK-45). Structural studies have shown that this region of αS is an α-helical conformation and represents the ganglioside binding region. *In vitro* experiments revealed that the interaction with GM1 results in α-helical folding propensity increase, reducing the aggregative state. Using GM2, GM3, and asialo-GM1 it has been shown the essentiality of both the sialic acid and the four neutral sugar residues present in the GM1 oligosaccharide for the specific interaction with αS and the consequent inhibition of fibrillar aggregation. Currently, in order to prove that the GM1 oligosaccharide is the only molecular portion of GM1 responsible for the interaction with αS and able to induce a resistance in its aggregation, I am working in collaboration with Dr. Tim Bartels from London College University, Dementia Research Institute, London, UK.

Project: Role of GM1 oligosaccharide as mitochondrial regulator in Parkinson's Disease
Role: PI
Partners: Prof. Maria-Trinidad Herrero Hezquerro, University of Murcia, Murcia, Spain, Prof. Nico Mitro and Prof. Gabriella Tedeschi, Milano University, Italy
Description: The GM1 efficacy *in vitro*, in mouse and in non-human primate MPTP model of PD has been reported. MPTP exerts its neurotoxic effect by the interference with mitochondria respiration via inhibition of complex I, leading to neuronal cell death especially in striatum and *substantia nigra*, the brain area most sensitive to MPTP-induced neurotoxicity. An additional mechanism of MPTP toxicity involves oxidative stress resulting in generation of ROS by mitochondria of dopaminergic neurons. Finally MPTP seems to induce glutamate mediated excitotoxicity, due to an increase in [Ca^{2+}]i, which contributes to the exacerbation of nigrostriatal degeneration in PD. The involvement of mitochondria machinery with anti-inflammatory action and oxidative stress protection, both of which contributes to PD neurodegeneration, has been reported.

Recently by MS analysis, we found an increased mitochondria bioenergetics and expression of mitochondria proteins upon OligoGM1 administration (Chiricozzi *et al*. 2019 *Mol Neurobiol*). By biochemical studies we found that OligoGM1 protects N2a cells from MPTP toxic effect as well as from mitochondrial oxidative stress (Lunghi *et al*. 2018 *FEBS Open Bio*). Moreover, by immunoblotting we identified an increased expression of Tom20/HtrA2 mitochondrial proteins, whose reduced expression has been associated with PD. At functional level, we found increased basal and uncoupled mitochondrial respiration following OligoGM1 administration. The effect of the oligosaccharide portion of GM1 is currently under evaluation using the MPTP mice, an *in vivo* model recapitulating typical neurological lesions of PD, which is fully accepted for the exploration of neuroprotective and neurorestorative strategies.
This project is running in collaboration with Prof. Maria-Trinidad Herrero Hezquerro at the Clinical & Experimental Neuroscience (NiCE-IMIB), Department of Human Anatomy & Psychobiology, University of Murcia, Murcia, Spain, wit Prof. Gabriella Tedeschi, and with Prof. Nico Mitro, Department of Pharmacological Sciences, University of Milano, Milano, Italy and I am the head of collaborative project.

Project: Role of GM1 oligosaccharide in development, aging and neurodegeneration of central nervous system
Role: PI
Partner: Dr. Michela Deleidi, Hertie Institute for Clinical Brain Research, Department of Neurodegenerative Disease, University of Tübingen, Germany
Description: Following the identification of the molecular portion of the GM1 ganglioside responsible of inducing neuroblastoma cells differentiation and protection, we decide to better understand the role of GM1 oligosaccharide on neuronal differentiation and development, studying its effect on mouse immature neurons and primary neurons prepared from induced pluripotent stem cells (iPS). Preliminary results showed that GM1-oligosaccharide accelerates in vitro neuron's development, with a significant impact on neuronal migration, dendrite emission and growth cone elongation. From a molecular point view, oligosaccharide effects seem to be due to an interaction at plasma membrane level that results in an early activation of TrkA receptor associated to MAPK and FAK increased phosphorylation. These data suggest that GM1-oligosaccharide represents a completely new neurotrophic player whose potential will be further investigated in the context of aging and neurodegenerative disorders. To do that we are now characterizing the process of aging in cerebellar granule neurons and we are working on neurons prepared from iPS derivate from sporadic PD patients.

Project: Molecular details of sugar-protein interactions in biomembranes
Role: PI
Partners: Dr. Valeria Rondelli and Dr. Giuliano Zanchetta, Department of Medical Biotechnology and Translational Medicine University of Milano, Milano, Italy and Prof. Ivano Eberini, Department of Pharmacological Sciences, University of Milano, Milano, Italy
Description: Recently we pointed out that the minimal structure required for GM1 neuro-properties is represented by the GM1 oligosaccharide chain (II3Neu5Ac-Gg4), which interacts with plasma membrane (PM) proteins (like TrkA). It was found that the soluble GM1 oligosaccharide is able to cross an in vitro model of human blood brain barrier, using a paracellular route, maintaining its stability and its differentiative properties [Maggioni et al. FEBS Open Bio, 8:14-017 (2018)]. In addition, X-Ray Scattering measurements demonstrated OligoGM1-PM interaction and highlighted its dependence on membrane composition and its effects on membrane structuring in solution. Neutron reflectivity measurements on supported model membranes also allowed to confirm the hypothesis that the interaction is localized to the membrane surface. Based on these evidences, we are aimed to characterize and quantify the interactions between GM1 (and its oligosaccharide derivatives) and putative protein targets within a membrane environment. In particular, we aim at discriminating among possible scenarios for GM1-induced activation of signaling pathways at plasma membrane: i) the oligosaccharide chain directly interacts with the TrkA extracellular

portion; ii) GM, acting on a different PM receptor, induces a trans activation of TrkA by modulating the PM organization; iii) GM1 in the PM modulates the TrkA activity within the lipid rafts.

Project: Studying the role of GM1 deficiency in the onset of Alzheimer's disease
Role: PI of the unit involved in the biochemical studies
Partner: Dr. Luciano D'Adamio, Department of Pharmacology, Physiology and Neuroscience, Rutgers University, Newark, NJ, US
Description: Recent evidence suggest a deficit of gangliosides content (GD1a and GM1) in the frontal cortex of Alzheimer' patients, suggesting a possible role for gangliosides in the establishment of neurodegenerative condition. In this contest, I am the head of the biochemical units investigating the lipid content in brain tissues from rat model of Alzheimer's disease. Preliminary data highlight a reduction in a-series gangliosides.

Project: Biochemical Characterization of the GBA2 Missense Mutation in Lymphoblastoid Cells from Patients with Spastic Ataxia
Role: Co-PI of the unit involved in the biochemical studies
Partner: Dr. Massimo Aureli, Department of Medical Biotechnology and Translational Medicine, University of Milano and Prof. Kyproula Christodoulou, Neurognetics Department, Cyprus Institute of Neurology and Genetics
Description: The research group is investigating the molecular mechanism responsible for the onset of Spastic Ataxia following the GBA2 c.1780G>C [p.Asp594His] missense mutation, in a Cypriot consanguineous family with spastic ataxia. The data obtained (Malekkou, Samarani et al. 2018 *Int J Mol Sci*) showed that the mutation strongly reduce NLGase activity both intracellularly and at the plasma membrane level. Additionally, we observed a two-fold increase of GlcCer content in LCLs derived from patients compared to controls, with the C16 lipid being the most abundant GlcCer species. Moreover, we showed that there is an apparent compensatory effect between NLGase and the lysosomal glucosylceramidase (GCase), since we found that the activity of GCase was three-fold higher in LCLs derived from patients compared to controls. We conclude that the c.1780G>C mutation results in NLGase loss of function with abolishment of the enzymatic activity and accumulation of GlcCer accompanied by a compensatory increase in GCase.

Project: Investigating the role of the sphingolipids in the onset of cellular damage occurring in cancer cells treated with ionization radiation
Role: Co-PI of the unit involved in the biochemical studies
Partners: Dr. Nadia di Muzio, Radiotherapy Center of San Raffaele Hospital Milano and Dr. Sandro Sonnino and Massimo Aureli, Department of Medical Biotechnology and Translational Medicine, University of Milano
Description: Since 2011 I am involved in a research group investigating the role of plasma membrane glycosphingolipid and associated glycohydrolases inducing the production of cytotoxic ceramide following radiotherapy treatment. Our data (Aureli, Chiricozzi *et al*. 2012 *Glycoconj J*) open a new scenario on the involvement of glycosphingolipip in the cancer radiotherapy.

Project: Investigating the role of glycosphingolipid-derived ceramide in different tumor cell type
Role: Co-PI of the unit involved in the biochemical studies
Partners: Dr. Vincenzo Russo, San Raffaele Research Institute, Milano and Prof. Sandro Sonnino, Department of Medical Biotechnology and Translational Medicine, University of Milano
Description: Since 2011, I participate in a research project aimed to define the mechanism by which LXRα-silencing induces apoptosis through glycosphingolipid-derived ceramide in multiple myeloma cell lines. The data obtained suggest that in shLXRα-sensitive cells the tumor-promoting role of LXRα might be due to an effect on the SREBP-1c-driven *de novo* lipogenesis. FASN inactivation could be responsible for a reorganization of cell membrane given a decrease in the synthesis of fatty acids, therefore an alteration of lipid metabolism: increase in glycohydrolase activity and in plasma membrane glycosphyngolipids (GM3, LacCer, GlcCer) and pro-apoptotic ceramide. This pathway may represent a novel potential drug-target in

multiple-myeloma and other tumors (Chiricozzi *et al* 2011 *FEBS J*, Aureli, Chiricozzi *et al*. 2012 *Glycoconj J*).

Project: Studying the role of sphingolipids in the stabilization of the protein CTFR at the cell plasma membrane
Role: Co-PI of the unit involved in the biochemical studies
Partners: Dr. Massimo Aureli, Department of Medical Biotechnology and Translational Medicine, University of Milano, Dr. Maria Cristina Dechecchi and Dr. Anna Tamanini, University Hospital, Verona, Italy
Description: Since 2015 I am part of research project aimed to study the effect of Pseudomonas aeruginosa infection on plasma membrane sphingolipid composition in epithelial cells derived from Cystic Fibrous (CF) patients (CuFi-1 cells). The data obtained showed that Pseudomonas aeruginosa infection causes a recruitment of plasma membrane-associated glycosphingolipid hydrolases into lipid rafts of CuFi-1-infected cells. This reorganization of cell membrane may be responsible for activation of a signaling cascade, culminating in aberrant inflammatory response in CF bronchial epithelial cells upon bacterial infection (Schiumarini, Chiricozzi *et al*. 2017 *Mediators Inflam*). Taken together, the presented data further support the role of sphingolipids and their metabolic enzymes in controlling the inflammatory response in CF.

PUBLICATIONS

The scientific activity (2010-2019) is documented by 37 peer-reviewed articles, with a total impact factor of 146,762, with 211 citation and with an h-index of 8 (Scopus). I have the first/last authorships for 17 and the corresponding author for 3 of those publications.

1. **E. Chiricozzi,** M. Maggioni, E. Di Biase, G. Lunghi, M. Fazzari, N. Loberto, E. Maffioli, F. Grassi-Scalvini, G. Tedeschi, S. Sonnino (2019) The Neuroprotective Role of the GM1 Oligosaccharide, $II^3Neu5Ac\text{-}Gg_4$, in Neuroblastoma Cells. *Mol Neurobiol*. Mar 26. doi: 10.1007/s12035-019-1556-8. [Epub ahead of print]

2. **E. Chiricozzi**, E. Di Biase, G. Lunghi, M. Fazzari, M. Maggioni, D.Y. Pomè, R. Casellato, N. Loberto, L. Mauri, S. Sonnino (2019) GM1 promotes TrkA-mediated neuroblastoma cell differentiation by occupying a plasma membrane domain different from TrkA *J Neurochem* Feb 18, 2019 DOI:10.1111/jnc.14685

3. M. Maggioni, E. Di Biase, G. Lunghi, E. Sevin, F. Gosselet, **E. Chiricozzi**, S. Sonnino S (2018) Charaterization of GM1 oligosaccharide transport across the blood-brain-barrier *FEBS Open Bio*, 8:14-017 doi:10.1002/2211-5463.12453

4. G. Lunghi, M. Maggioni, E. Di Biase, G. Tedeschi, E. Maffioli, F. Grassi Scalvini, **E. Chiricozzi**, S. Sonnino (2018) GM1 neuroprotective properties are related to GM1 oligosaccharide *FEBS Open Bio*, 8:14-018 doi:10.1002/2211-5463.12453

5. A. Malekkou, M. Samarani, A. Drousiotou, C. Votsi, S. Sonnino, M. Pantzaris, **E. Chiricozzi**, E. Zamba-Papanicolaou, M. Aureli, N. Loberto, K. Christodoulou (2018) Biochemical Characterization of the GBA2 c.1780G>C Missense Mutation in Lymphoblastoid Cells from Patients with Spastic Ataxia. *Int J Mol Sci*. 19(10). pii: E3099. doi: 10.3390/ijms19103099.

6. M. Samarani, N. Loberto, G. Soldà, L. Straniero, R. Asselta, S. Duga, G. Lunghi, F.A. Zucca, L. Mauri, M.G. Ciampa, D. Schiumarini, R. Bassi, P. Giussani, **E. Chiricozzi**, A. Prinetti, M. Aureli, S: Sonnino (2018) A lysosome-plasma membrane-sphingolipid axis linking lysosomal storage to cell growth arrest. *FASEB J*. 32, 5685-5702.

7. S. Sonnino, **E. Chiricozzi**, S. Grassi, L. Mauri, S. Prioni, A. Prinetti (2018) Gangliosides in Membrane Organization. *Prog Mol Biol Transl Sci*. 156:83-120

8. N. Loberto, G. Lunghi, D. Schiumarini, M. Samarani, **E. Chiricozzi**, M. Aureli (2018) Methods for Assay of Ganglioside Catabolic Enzymes. *Methods Mol Biol*. 1804:383-400. doi: 10.1007/978-1-4939-8552-4_18.

9. S. Grassi, E. **Chiricozzi,** L. Mauri, S. Sonnino, A. Prinetti (2019) Sphingolipids and neuronal degeneration in lysosomal storage disorders. *J Neurochem*. 148 :600-611. doi: 10.1111/jnc.14540.

10. M. Aureli, M. Samarani, N. Loberto, **E. Chiricozzi**, L. Mauri, S. Grassi, D. Schiumarini, A. Prinetti, S. Sonnino (2018) Neuronal membrane dynamics as fine regulator of sphingolipid composition. *Glycoconj J*. 35(4):397-402.

11. **E. Chiricozzi,** L. Mauri, M.G. Ciampa, A. Prinetti, S. Sonnino (2018) On the use of cholera toxin. *Glycoconj J*. 35, 161-163.

12. **E. Chiricozzi**, N. Loberto, D. Schiumarini, M. Samarani, G. Mancini, A. Tamanini, G. Lippi, M.C. Dechecchi, R. Bassi, P. Giussani, M. Aureli (2018) Sphingolipids role in the regulation of inflammatory response: from leukocyte biology to bacterial infection. *J. Leuk. Biol*. DOI:10.1002/JLB.3MR0717-269R

13. **E. Chiricozzi**, Y.D. Pomè, M. Maggioni, E. Di Biase, C. Parravicini, L. Palazzolo, N. Loberto, I. Eberini, S. Sonnino (2017) Role of the GM1 ganglioside oligosaccharide portion in the TrkA-dependent neurite sprouting in neuroblastoma cells. *J Neurochem*. 143(6):645-659 doi: 10.1111/jnc.14146

14. D. Schiumarini, N. Loberto, G. Mancini, R. Bassi, P. Giussani, **E. Chiricozzi**, M. Samarani, S. Munari, A. Tamanini, G. Cabrini, G. Lippi, M.C. Dechecchi, S. Sonnino, M. Aureli (2017) Evidence for the involvement of lipid rafts and plasma membrane sphingolipid-hydrolases in Pseudomonas aeruginosa infection of cystic fibrosis bronchial epithelial cells *Mediators Inflamm*. doi: 10.1155/2017/1730245

15. E. Di Biase, **E. Chiricozzi**, M. Maggioni, D. Y. Pomè, M. Samarani, S. Prioni, M. Aureli, S. Sonnino (2017) Study of the neurodifferentiative role of GM1 oligosaccharide chain in mouse primary cerebellar neurons. Poster Sessions Monday/Tuesday. *J. Neurochem*., 142:78–164. doi:10.1111/jnc.14093

16. M. Maggioni, **E. Chiricozzi**, D. Y. Pomè, E. D. Biase, M. Aureli, S. Sonnino (2017) GM1 neurotrophic properties are related to GM1 oligosaccharide - TRKA interaction. Poster Sessions Monday/Tuesday. *J. Neurochem*., 142:78–164. doi:10.1111/jnc.14093

17. **E. Chiricozzi**, D.Y. Pomè, M. Maggioni, E.D. Biase, C. Parravicini, I. Eberini, S. Sonnino (2017) GM1 neurotrophic properties are related to GM1 oligosaccharide - TrkA interaction in mouse neuroblastoma cells, Young Members' Symposia. *J. Neurochem*., 142:63–71. doi:10.1111/jnc.14091

18. **E. Chiricozzi**, Y.D. Pomè, M. Maggioni, E. Di Biase, C. Parravicini, I. Eberini, S. Sonnino (2017) The Neurotrophic properties of GM1 oligosaccharide: a new promising story *Glycoconj J* 34(Suppl 1): 1. DOI: 10.1007/s10719-017-9784-5

19. M. Aureli, M. Samarani, N. Loberto, G. Mancini, V. Murdica, **E. Chiricozzi**, A. Prinetti, R. Bassi and S. Sonnino (2016) Current and Novel Aspects on the Non-lysosomal ß-Glucosylceramidase GBA2. *Neurochem Res* 41(1-2):210-20. DOI: 10.1007/s11064-015-1763-2.

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20. S. Chiaretti, V. Astro, **E. Chiricozzi** and I. De Curtis (2016) Effects of the scaffold proteins liprin-α1, β1 and β2 on invasion by breast cancer cells. *Biol Cell* 108(3):65-75. DOI: 10.1111/boc.201500063.

21. S. Sonnino, **E. Chiricozzi**, M.G. Ciampa, L. Mauri, A. Prinetti, G. Toffano and M. Aureli (2016) Serum Antibodies to Glycans in Peripheral Neuropathies. *Mol Neurobiol* DOI: 10.1007/s12035-016-9775-8

22. S. Sonnino, S. Grassi, S. Prioni, M.G. Ciampa, **E. Chiricozzi** and A. Prinetti (2016) Lipids rafts and neurological disease In *eLS* John Wiley & Sons, Ltd: Chichester *in press*. DOI: 10.1002/9780470015902.a0023405

23. **E. Chiricozzi**, M.G. Ciampa, Brasile G., Compostella F., A. Prinetti, Nakayama H., Eyalongo R.C., K. Iwabuchi, S. Sonnino and L. Mauri (2015) Direct interaction, instrumental for signaling processes, between Lactosylceramide and Lyn in the lipid rafts of neutrophile-like cells. *J Lipid Res* 56(1):129-41. DOI: 10.1194/jlr.M055319.

24. **E. Chiricozzi**, A. Paniccia, V. Russo and S. Sonnino (2015) LXRα-silencing induces apoptosis by glycosphingolipid-derived ceramide in different tumor type. *Glycoconj J* 32(5):173-342 DOI: 10.1007/s10719-015-9596-4

25. **E. Chiricozzi**, N. Niemir, M. Aureli, A. Magini, N. Loberto, A. Prinetti, R. Bassi, A. Polchi, C. Emiliani, C. Caillaud and S. Sonnino (2014) Chaperone therapy for GM2 gangliosidosis: effects of pyrimethamine on β-hexosaminidase activity in Sandhoff fibroblasts. *Mol Neurobiol* 50(1):159-67. DOI: 10.1007/s12035-013-8605-5.

26. V. Murdica, M. Aureli, N. Loberto, R. Bassi, M. Samarani, S. Prioni, **E. Chiricozzi**, V. Chigorno, A. Prinetti, S. Sonnino (2013) Glycohydrolases and glycosphingolipids behavior in acid-sphingomyelinase knock-out mice. *FEBS Journal* 280:3-617 DOI: 10.1111/febs.12340

27. **E. Chiricozzi**, M. Aureli, N. Loberto, A. Magini, N. Niemir, A. Polchi, R. Bassi, C. Emiliani, C. Caillaud and S. Sonnino (2013) Pyrimethamine chaperone enhances β-hexosaminidase activity in Sandhoff fibroblasts without restoring lysosomal GM2 catabolism. *FEBS Journal* 280:3-617 DOI: 10.1111/febs.12340

28. S. Prioni, M. Aureli, N. Loberto, R. Bassi, V. Murdica, M. Samarani, **E. Chiricozzi**, V. Chigorno, S. Sonnino and A. Prinetti (2013) Glycosphingolipid patterns and glycohydrolases behavior in acid-sphingomyelinase knock-out mice. *J Neurochem* 125:194-280, Supplement I DOI: 10.1111/jnc.12186

29. L. Raccosta, R. Fontana, D. Maggioni, C. Laura, E.J. Villablanca, A. Leiva, **E. Chiricozzi**, J.A. Gustafsson, K.R. Steffensen, C. Doglioni, S.G. Feo, L. Mauri, C. Sensi, I. Eberini, A. Prinetti, S. Sonnino, S. Sozzani, J.R. Mora, C. Bordignon, C. Traversari and R. Vincenzo (2013) The Oxysterol-CXCR2 Axis Plays a Key Role in the Recruitment of Tumor Promoting Neutrophils. *J Exp Med* 210(9):1711-28. DOI: 10.1084/jem.20130440.

30. **E. Chiricozzi,** H. Nakayama, S. Watanabe, L. Mauri, G. Brasile, MG Ciampa, F. Compostella, F. Ronchetti, V. Chigorno, A. Prinetti, S. Sonnino and K. Iwabuchi (2012) Lyn-coupled LacCer-enriched lipid rafts in neutrophilis: a possible organization *FEBS Journal* 279:241-242 DOI: 10.1111/j.1742-4658.2010.08705.x

31. M. Aureli, R. Bassi, A. Prinetti, **E. Chiricozzi**, B. Pappalardi, V. Chigorno, N. Di Muzio, N. Loberto and S. Sonnino (2012) Ionizing radiation increase the activity of cell surface glycohydrolases and plasma membrane ceramide content. *Glycoconj J* 29(8-9):585-97. DOI: 10.1007/s10719-012-9385-2.

32. **E. Chiricozzi**, S. Prioni, V. Chigorno, A. Prinetti and S. Sonnino (2011) Secondary accumulations of gangliosides in sphingolipidosis. *J Neurochem* 118:210 Issue S1 DOI: 10.1111/j.1471-4159.2011.07326.x

33. Prinetti, S. Prioni, **E. Chiricozzi**, Edward H. Schuchman, V. Chigorno and S. Sonnino (2011) Secondary alterations of sphingolipid metabolism in lysosomal storage disease. *Neurochem Res* 36(9):1654-68 DOI: 10.1007/s11064-010-0380-3.

34. **E. Chiricozzi**, M. Aureli, N. Loberto, P. Lanteri, V. Chigorno, A. Prinetti and S. Sonnino (2011) Cell surface glycohydrolase modulation during tumor irradiation. *FEBS Journal* Supplement I *Erratum*. 278:1–3. DOI: 10.1111/j.1742-4658.2011.08225.x

35. **E. Chiricozzi**, S. Prioni, V. Chigorno, A. Prinetti and S. Sonnino (2011) Secondary accumulations of gangliosides in sphingolipidosis. *FEBS Journal* Supplement I 278: 74–445 DOI: 10.1111/j.1742-4658.2011.08137.x

36. **E. Chiricozzi**, S. Fernandez-Fernandez, A. Almeida', J.P. Bolaños and G. Goracci (2009) Group IIA secretory phospholipase A_2 (sPLA$_2$-IIA) activation contributes to apoptosis after NMDA-receptor over-activation in primary neurons. *J Neurochem* 110:19-28 Issue S1, DOI: 10.1111/j.1471-4159.2009.06064_6.x)

37. **E. Chiricozzi**, S. Fernandez-Fernandez, V. Nardicchi, A. Almeida, J.P. Bolaños, and G. Goracci (2010) Group IIA secretory phospholipase A_2 (GIIA) mediates apoptotic death during NMDA-receptor activation in rat primary cortical neurons. *J Neurochem* 112(6):1574-83. DOI: 10.1111/j.1471-4159.2010.06567.x.

EDITING AND REVIEWING

I have reviewed several articles for the following journals:

- FEBS Letters, *2012-now*
- World Journal of Pediatrics, *2014-now*
- Molecular Neurobiology, *2014-now*
- Glycoconjugate Journal, *2017-now*
- Molecular Genetics and Metabolism Journal, *2018-now*
- Molecular and Cellular Neuroscience, *2019-now*

In addition, I was invited (2019) to join the Editorial Board of Frontiers in Molecular Neuroscience as Review Editor for Frontiers in Neuroscience.

MEMBERSHIP

- International Society for Neurochemistry (ISN), *2011-now*
- Italian Society of Biochemistry (SIB), *2010-now*
- European Society for Neurochemistry (ESN), *2009-now*

MEETING ORGANIZATION

- ESN Biennial Conference, Molecular Mechanism of Regulation of the Nervous System, to be held Milano, Italy, September 1-4, 2019 – *Local committee*
- 25th International Symposium on Glycoconjugates, to be held in Milano, Italy, August 25-31, 2019 – *Local committee*
- BioMeTra Workshop, September 24, 2018
  Department of Medical Biotechnology and Translational Medicine, University of Milano, Lita, Segrate, Milano (MI), Italia – *Scientific committee*
- BioMeTra Seminars 2017-2018
  Department of Medical Biotechnology and Translational Medicine, University of Milano, Lita, Segrate, Milano (MI), Italia – *Scientific committee*
- BioMeTra Workshop, September 26, 2017
  Department of Medical Biotechnology and Translational Medicine, University of Milano, Lita, Segrate, Milano (MI), Italia – *Scientific committee*

DISSEMINATION ACTIVITY

- InnovaAgorà, Milano, Italy, May 6-8, 2019
- Biovaria, Munich, Germany, May 8-9, 2019
- Third mission for University of Milano: activities in primary schools in Milano and neighbouring municipalities to describe with a lay language the principle of biochemistry, 2014-present
- MeetMeTonight, September 28-29, 2018 "Run into the cell" – *Referent*
- Interview to Blockchain for Life project – *April 2018*
- Interview fot the BioMeTra facebook page – *2018*
- MeetMeTonight "Viaggio al centro della cellula" - *September 29-30, 2017*
- MeetMeTonight, "Viaggio al centro della cellula" - *September 30, 2016*
- MeetMeTonight, "Viaggio al centro della cellula" - *September 25-26, 2015*
- MeetMeTonight, "Tutta colpa della Biochimica" - *September 26-27, 2014*

KNOWLEDGE TRANSFER

Patent

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2018 - Italian Patent (N° 102018000007093)
Inventors: **Chiricozzi E**. and Sonnino S.
Holder: University of Milano
Title: "Oligosaccaridi per l'uso nel tratttamento della malattia di Parkinson – Oligosaccharide for the use in the treatment of the Parkinson's disease"

FUNDING .

Projects funded

- Funding Agency: University of Milano - Piano sostegno alla Ricerca 2019
  Title: BIOSWEET - Molecular details of sugar-protein interactions in Biomembranes
  Start/Ending dates: October 2019 / September 2020
  Amount of Money Allocated: Euro 20000
  Description: The proposed project aimed to characterize the interaction between plasma membrane components: proteins and lipids
  Role: PI

- Funding Agency: University of Milano - Piano sostegno alla Ricerca 2018
  Title: Uso dell'oligosaccaride del GM1 per il trattamento di neuroblastomi
  Start/Ending dates: October 2018 / September 2029
  Amount of Money Allocated: Euro 20000
  Description: The proposed project aimed to understand the oligosaccharide effect on neuroblastoma cell lines
  Role: PI

- Funding Agency: University of Milano - Piano sostegno alla Ricerca 2017
  Title: Verso il traslazionale: derivati del ganglioside GM1 per la cura della malattia di Parkinson
  Start/Ending dates: October 2017 / June 2019
  Amount of Money Allocated: Euro 30000
  Description: The proposed project aimed to understand the interaction between GM1 derivatives and plasma membrane components
  Role: Co-PI

Projects under evaluation

- Funding Agency: Cariplo Foundation - Biochemical Research conducted by young researcher 2019
  Title: Role of GM1 deficiency in the onset of Parkinson's disease — GoPARK
  Start/Ending dates: April 1, 2020 / March 31, 2022
  Amount of Money Requested: Euro 250000
  Description: The proposed project aimed to understand the molecular mechanism linking the reduction of plasma membrane GM1 to the onset of sporadic Parkinson's disease
  Role: PI

- Funding Agency: Banca D'Italia – Richiesta di contributo liberale
  Title: Un nuovo farmaco per il trattamento del Parkinson sporadico: l'oligosaccaride del GM1 (OligoGM1)
  Start/Ending dates: Sep 2019/Aug 2020
  Amount of Money Requested: Euro 50000

Description: The principal goal of the proposed project is to fully strengthen the oligosaccharide chain of GM1 ($II^3Neu5Ac\text{-}Gg_4$, OligoGM1) as a symptomatic and disease modifier molecule, able to block and/or reverse Parkinson's disease (PD) motor and non-motor symptoms and the sparing of dopaminergic neurons
Role: PI

- Funding Agency: Twenty-seven (2020) Research Grant from Mizutani Foundation for Glycoscience
  Title: $II^3Neu5Ac\text{-}Gg_4$ oligosaccharide as a new neurotrophic players
  Start/Ending dates: April 1, 2020/March 31, 2021
  Amount of Money Requested: US$ 58000
  Description: The proposed project aimed to understand how the oligosaccharide $II^3Neu5Ac\text{-}Gg_4$ modulates the neuronal processes, to understand its pharmaco-distribution when injected in mice and to develop a procedure for its bacterial production.
  Role: PI

FELLOWSHIPS

1. Fellowship by "Leonardo da Vinci II Programme in Bioinformatic and Nano-Biotechnology (Bio-NANO)" spend at the Laboratory of Biochemistry and Molecular Biology, University of Salamanca, under the supervision of Professor Juan Pedro Bolaños. January-May, 2008

2. Fellowship for Ph. D., Department of Medical Biotechnology and Translational Medicine, University of Milano 2010-2013

AWARDS

1. Glyco XXIV Poster Award – 24th International Symposium on Glycoconjugates, Jeju, Republic of Korea 27 August – 1 September 2017

2. Young Member Simposia Awardee ESN – ISN-ESN Meeting, Paris, France 20-24 August 2017

3. Travel Award - Frontiers in Sialic Acid Research Conference – From Structural Diversity to Functional Glycobiology, Bad Lauterberg, Germany 23-25 April 2016 by "The Cluster of Excellence: From Regenerative Biology to Reconstructive Therapy" REBIRTH Foundation.

4. Travel Award - XXIII International Symposium on Glycoconjugates GLYCO 23, Spit, Croatia, 15-20 September 2015 by International Glycoconjugate Organization (IGO)

5. Travel Award - 38th Federation of European Biochemical Societies (FEBS) Congress "Mechanisms in Biology" St. Petersburg, Russia, 6-11 July 2013 by Federation of European Biochemical Societies (FEBS)

6. Young Investigator Award - "Porcellati Foundation Young Investigator Lecture" International Society for Neurochemistry/American Society for Neurochemistry (ISN/ASN) Satellite meeting "Unveiling the Significance of Lipid Signaling in Neurodegeneration and Neuroprotection", Cancun, Mexico,17-19 April 2013 by Porcellati Foundation

7. Travel Award - 22nd International Union of Biochemistry and Molecular Biology (IUBMB) and 37th Federation of European Biochemical Societies (FEBS) Congress "From Single Molecules to Systems Biology", Siviglia, Spain, 4-9 September 2012 by Federation of European Biochemical Societies (FEBS)

8. Young Scientist Award - 12th Young Scientist Program, Costa Ballena, Spain, 1-4 September 2012 by Federation of European Biochemical Societies (FEBS)

9. Travel Award - 23rd International Society for Neurochemistry/European Society for Neurochemistry, (ISN/ESN) Biennal Meeting, Atene, Greece, 28 August-1 September 2011 by International Society of Neurochemistry (ISN)

10. Travel Award - 10th International Society for Neurochemistry (ISN) Summer School "Molecular basis of higher cognitive functions" Delphi, Greece, 24-28 August 2011 by International Society of Neurochemistry (ISN)

11. Travel Award - 36th Federation of European Biochemical Societies (FEBS) Congress "Biochemistry for tomorrow's medicine" Torino, Italy, 25-30 June 2011 By Società Italiana di Biochimica e Biologia Molecolare (SIB)

CONGRESS PARTICIPATION

1. ESN Biennial Conference, Molecular Mechanism of Regulation of the Nervous System, to be held Milano, Italy, September 1-4, 2019

2. 25th International Symposium on Glycoconjugates, to be held in Milano, Italy, August 25-31, 2019

3. AD/PD 14th Conference Lisbon, Portugal March 26-31, 2019

4. Gordon Research Conference "Glycolipid and Sphingolipid Biology on the Biochemistry, Biophysic and Physiology of Glycolipid and Sphyngolipid Biology", Galveston, Texas, USA February 11-16, 2018

5. 1st International Conference on the Glycobiology of Nervous System From the Genome Research Era to the Glycome Korea University, Seoul, Korea September 2-5, 2017

6. 24th International Symposium on Glycoconjugates, Jeju, Korea August 27 – September 1, 2017

7. ISN-ESN Meeting, Paris, France *August 20-24, 2017*

8. III° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italy June *25-27, 2017*

9. II° Giornata Scientifica del Gruppo delle Membrane, Italian Society of Biochemisty, Orto Botanico, Università di Catania, Catania, Italy *25-27 Giugno 2017*

10. Sialic Acid Research Conference, From Structural Diversity to Functional Glycobiology, Bad Lauterberg, Germania *23-25 Aprile 2016*

11. II° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italy *20-22 Marzo 2016*

12. GLYCO 23 XXIII International Symposium on Glycoconjugates, Split, Croatia, September 15-20, 2015

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13. I° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italia, *10-12 Aprile 2015*

14. San Raffaele Scientific Retreat, San Raffaele, Milano, Italia, *29-30 Novembre 2013*

15. ISN/ASN Satellite meeting Unveiling the Significance of Lipid Signaling in Neurodegeneration and Neuroprotection, Cancun, Mexico April 17-19, 2013

16. 37th FEBS Congress, 2012, Seville, Spain *September 4-9, 2012*

17. Young Scientists Program, Costa Ballena, Spain *September 1-4, 2012*

18. 24th Annual meeting of PhD School in Biochemistry of Italian Society of Biochemistry, Brallo di Pretola, Pavia, Italy *June 10-15, 2012*

19. Gordon Research Conference "Glycolipid and Sphingolipid Biology", Renaissance Tuscany Il Ciocco Resort, Barga, Lucca, Italy *April 22-27, 2012*

20. 84th Annual Meeting of the Japanese Biochemical Society, University of Kyoto, Japan *September 21-24, 2011*

21. 23rd ISN/ESN Biannual Meeting, Athens, Greece *August 28- September 1, 2011*

22. 36Th FEBS Congress "Biochemistry for tomorrow's medicine", Torino, Italy *June 25-31, 2011*

23. Annual meeting of regional section (Liguria-Lombardia-Piemonte) of Italian Society of Biochemistry, 2011, University of Novara, Novara, Italy *May 20, 2011*

24. Annual meeting of regional section (Liguria-Lombardia-Piemonte) of Italian Society of Biochemistry, 2010, University of Insubria, Varese, Italy *May 28, 2010*

25. 8ª Giornata di Studio sulle Cellule Staminali, UNISTEM, Centro per la Ricerca delle Cellule Staminali, Milan, Italy *January 29, 2010*

26. 18th European Society for Neurochemistry Meeting - 4th Conference on "Advances in Molecular Mechanisms of Neurological Disorders", Leipzig, Germany *July 11-14, 2009* – Poster presentation

27. 2° Encuentro Instituto de Neurosciencias Castilla Leòn/ Instituto Cajal, Madrid, Spain, Instituto Cajal, CSIN *January 17, 2008*

28. International Symposium on Novel Advances in Parkinson's Disease, Salamanca, Spain, Fundaciòn Ramòn Areces, *May 27-28, 2008*

COMMUNICATIONS TO SCIENTIFIC MEETINGS .

1. E. Di Biase, G. Lunghi, M. Fazzari, S. Prioni, S. Sonnino and **E. Chiricozzi** "The oligosaccharide chain of GM1 ganglioside acts as a neurotrophic agent for neuronal development" ESN Biennial Conference, Molecular Mechanism of Regulation of the Nervous System, to be held in Milano, Italy, September 1-4, 2019

2. G. Lunghi, M. Fazzari, E. Di Biase, M. Maggioni, G. Tedeschi, E. Maffioli, F. Grassi Scalvini, S. Sonnino and **E. Chiricozzi** "GM1 oligosaccharide modulation of calcium signaling in neuronal functions" ESN Biennial Conference, Molecular Mechanism of Regulation of the Nervous System, to be held in Milano, Italy, September 1-4, 2019

3. M. Fazzari, G. Lunghi, E. Di Biase, M. Audano, E. Maffioli, F. Grassi Scalvini, G. Tedeschi, N. Mitro, S. Sonnino and **E. Chiricozzi** "GM1 oligosaccharide as mitochondrial regulator in neuronal cells" ESN Biennial Conference, Molecular Mechanism of Regulation of the Nervous System, to be held in Milano, Italy, September 1-4, 2019

4. E. Di Biase, G. Lunghi, M. Fazzari, S. Prioni, **E. Chiricozzi** and S. Sonnino "Neurotrophic properties of GM1 oligosaccharide: evidence on the development of primary neurons in culture" 25th International Symposium on Glycoconjugates, to be held in Milano, Italy, August 25-31, 2019

5. M. Fazzari, G. Lunghi, E. Di Biase, M. Audano, E. Maffioli, F. Grassi Scalvini, G. Tedeschi, N. Mitro, **E. Chiricozzi** and S. Sonnino "Mitochondrial modulation: a novel role for GM1 oligosaccharide" 25th International Symposium on Glycoconjugates, to be held in Milano, Italy, August 25-31, 2019

6. G. Lunghi, M. Fazzari, E. Di Biase, L. Mauri, E. Maffioli, F. Grassi Scalvini, G. Tedeschi, **E. Chiricozzi** and S. Sonnino "GM1 oligosaccharide modulation of calcium signaling in neuronal functions" 25th International Symposium on Glycoconjugates, to be held in Milano, Italy, August 25-31, 2019

7. **E. Chiricozzi**, G. Lunghi, E. Di Biase, M. Fazzari, M. Valsecchi, L. Mauri, S. Alselehdar, R.W. Ledeen and S Sonnino "The GM1 ganglioside oligosaccharide-TrkA interaction as starting biochemical information for the developing of a new therapy for the treatment of Parkinson's disease" 25th International Symposium on Glycoconjugates, to be held in Milano, Italy, August 25-31, 2019

8. G. Lunghi, M. Maggioni, E. Di Biase, M. Fazzari , G. Tedeschi, E. Maffioli, F. Grassi-Scalvini, S. Sonnino and **E. Chiricozzi** "GM1 oligosaccharide is the active portion responsible for GM1 neuroprotective properties" 2019 ISN-ASN Meeting to be held in Montreal, Canada August 4-8, 2019

9. M. Fazzari, G. Lunghi, E. Di Biase, M. Audano, N. Mitro, S. Sonnino and **E. Chiricozzi** "The GM1 oligosaccharide stimulates mitochondriogenesis and enhances mitochondrial activity in neuroblastoma cells" 2019 ISN-ASN Meeting to be held in Montreal, Canada August 4-8, 2019

10. **E. Chiricozzi**, E Di Biase, G Lunghi, M Fazzari, S Prioni, E Sevin, F Gosselet, R Ledeen and S Sonnino "GM1 oligosaccharide as a new therapeutic player for sporadic Parkinson's disease" PD/AD 14th conference, Lisbon, Portugal, March 26-31, 2019

11. **E. Chiricozzi** "Ganglioside neurotrophic properties and the microenvironment of TrkA in neuroblastoma cells" Gordon Research Conference – Glycolipid and Sphingolipid Biology on the Biochemistry, Biophysics and Physiology of Glycolipid and Sphyngolipid Biology, Galveston, TX, USA, February 11-16, 2018.

12. E. Di Biase, M. Maggioni, G. Lunghi, **E. Chiricozzi** and S. Sonino "Effects of GM1 Oligosaccharide on differentiation of mouse primary neurons" Gordon Research Conference – Glycolipid and Sphingolipid Biology on the Biochemistry, Biophysics and Physiology of Glycolipid and Sphyngolipid Biology, Galveston, TX, USA, February 11-16, 2018

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13. E. Di Biase, M. Maggioni, M. Samarani, S. Prioni, **E. Chiricozzi** and S. Sonnino "Dissecting molecular basis of ganglioside gm1 neuro-properties: effects of GM1 oligosaccharide on differentiation of mouse primary neurons" Workshop BIOMETRA 2017, Università di Milano, Milano, Italia, 26 Settembre 2017

14. M. Maggioni, E. Di Biase, C. Parravicini, I. Eberini, **E. Chiricozzi** and S. Sonnino "Mouse neuroblastoma cells neurodifferentiation promoted by GM1 ganglioside is mediated by the interaction between its oligosaccharide and TrkA receptor"Workshop BIOMETRA 2017, Università di Milano, Milano, Italia, 26 Settembre 2017

15. **E. Chiricozzi**, M. Maggioni, E. Di Biase, D.Y. Pomè and S. Sonnino "GM1 oligosaccharide neurotrophic properties" 1st International Conference on the Glycobiology of Nervous System From the Genome Research Era to the Glycome, Korea University, Seoul, Korea, September 2-5, 2017

16. **E. Chiricozzi**, Y.D. Pomè, M. Maggioni, E. Di Biase, C. Parravicini, I. Eberini, S. Sonnino "The Neurotrophic properties of GM1 oligosaccharide: a new promising story" 24th International Symposium on Glycoconjugates, Jeju, Korea August 27 – September 1, 2017

17. E. Di Biase, **E. Chiricozzi**, M. Maggioni, D. Y. Pomè, M. Samarani, S. Prioni, M. Aureli, S. Sonnino "Study of the neurodifferentiative role of GM1 oligosaccharide chain in mouse primary cerebellar neurons". ISN-ESN Meeting, Paris, France *August 20-24, 2017*

18. M. Maggioni, **E. Chiricozzi**, D. Y. Pomè, E. Di Biase, M. Aureli, S. Sonnino "GM1 neurotrophic properties are related to GM1 oligosaccharide - TRKA interaction". ISN-ESN Meeting, Paris, France *August 20-24, 2017*

19. **E. Chiricozzi**, Y.D. Pomè, M. Maggioni, E. Di Biase, C. Parravicini, I. Eberini, S. Sonnino "GM1 neurotrophic properties are related to GM1 oligosaccharide TrkA-Interaction in mouse neuroblastoma cells" ISN-ESN Meeting, Paris, France *August 20-24, 2017*

20. E. Di Biase, **E. Chiricozzi**, M. Maggioni, D. Yuri Pomè, M. Samarani, N. Loberto, M. Aureli, S. Sonnino "GM1 oligosaccharide as new pharmacological perspective in central nervous system damage" III° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italia June 25-27, 2017

21. M. Maggioni, **E. Chiricozzi**, E. Di Biase, D. Y. Pomè, M. Aureli, C. Parravicini, I. Eberini, S. Sonnino "GM1 neurotrophic properties are related to GM1 oligosaccharide – TrkA interaction in mouse neuroblastoma cells" III° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italy, June 25-27, 2017

22. **E. Chiricozzi** "The neurotrophic properties of GM1 oligosaccharide: a new promising story",III° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italy June *25-27, 2017*

23. **E. Chiricozzi** "The neurotrophic properties of GM1 oligosaccharide: a new promising story", II° Giornata Scientifica del Gruppo delle Membrane, Italian Society of Biochemisty, Orto Botanico, Università di Catania, Catania, Italy June *25-27, 2017*

24. **E. Chiricozzi**, D.Y. Pomè, M. Samarani, MG Ciampa, L. Mauri, M. Aureli, S. Sonnino "Neu5AcGgOse4, the GM1 ganglioside oligosaccharide, induces neuritogenesis and activates phosphorylation of TRK receptors in mouse neuroblastoma cells" Sialic Acid Research Conference – From Structural Diversity to Functional Glycobiology, Bad Lauterberg, Germany, April 23-25, 2016

25. **E. Chiricozzi**, D.Y. Pomè, L. Mauri, M. Aureli, S. Sonnino "GM1 ganglioside oligosaccharide activates phosphorylation of TRK receptors inducing neuritogenesis in mouse neuroblastoma cells" II° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italy March 20-22, 2016

26. **E. Chiricozzi**, A. Paniccia, V. Russo and S. Sonnino "LXRα-silencing induces apoptosis by glycosphingolipid-derived ceramide in different tumor type" GLYCO 23 Congress, Split, Croatia September 15–20, 2015 published in a special issue of Glycoconjugate Journal 2015 32(5):173-342

27. **E. Chiricozzi**, D.Y. Pomè, M.G. Ciampa, L. Mauri, M. Aureli, S. Sonnino "The fate of exogenous ganglioside: how can they reach the brain?" I° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italy, April 10-12, 2015

28. V. Murdica, M. Aureli, N. Loberto, R. Bassi, M. Samarani, S. Prioni, **E. Chiricozzi**, V. Chigorno, A. Prinetti and S. Sonnino "Glycohydrolases and glycosphingolipids behavior in acid-sphingomyelinase knock-out mice" 38Th FEBS Congress, Saint Petersburg, Russia July 1-6, 2013 published in a special issue of FEBS Journal DOI: 10.1111/febs.12340

29. **E. Chiricozzi**, M. Aureli, N. Loberto, A. Magini, N. Niemir, A. Polchi, R. Bassi, C. Emiliani, C. Caillaud and S. Sonnino. "Pyrimethamine chaperone enhances betahexosaminidase activity in Sandhoff fibroblasts without restoring lysosomal GM2 catabolism" 38Th FEBS Congress, Saint Petersburg, Russia July 1-6, 2013 published in a special issue of FEBS Journal DOI: 10.1111/febs.12340

30. S. Prioni, M. Aureli, N. Loberto, R. Bassi, V. Murdica, M. Samarani, **E. Chiricozzi**, E. Chigorno, S. Sonnino, A. Prinetti Glycosphingolipid patterns and glycohydrolases behavior in acid-sphingomyelinase knock-out mice. The 24th Biennial Meeting of the International Society for Neurochemistry and the American Society for Neurochemistry. 20–24 April 2013. Cancun, Mexico. published in a special issue of Journal of Neurochemistry DOI: 10.1111/jnc.12186

31. **E. Chiricozzi**, N. Niemir, M. Aureli, A. Magini, N. Loberto, R. Bassi, A. Polchi, A. Prinetti, C. Emiliani, C. Caillaud and S. Sonnino. "Effect of the pharmacological chaperone "Pyrimethamine" on ß-Hexosaminidase activity in Sandhoff fibroblasts" ISN/ASN Satellite meeting Unveiling the Significance of Lipid Signaling in Neurodegeneration and Neuroprotection, Cancun, Mexico April 17-19, 2013

32. **E. Chiricozzi,** H. Nakayama, S. Watanabe, L. Mauri, G. Brasile, MG Ciampa, F. Compostella, F. Ronchetti, V. Chigorno, A. Prinetti, S. Sonnino and K. Iwabuchi "Lyn-coupled LacCer-enriched lipid rafts in neutrophilis: a possible organization" (2012) YSP 12 Costa Ballena, Cádiz, Spain, September 1-4, 2012 and 37Th FEBS Congress, Sevilla, Spain, September 4-9, 2012 published in a special issue of FEBS Journal 279:241-242 doi: 10.1111/j.1742-4658.2010.08705.x

33. **E. Chiricozzi** "Lyn-coupled LacCer-enriched lipid rafts in neutrophilis: a possible organization" 24th Annual meeting of PhD School in Biochemistry of Italian Society of Biochemistry, June 14, 2012 Brallo di Pretola, Pavia, Italy

34. **E. Chiricozzi**, L. Mauri, M.G. Ciampa, G. Brasile, H. Nakayama, S. Watanabe, F. Compostella, F. Ronchetta, A. Prinetti, K. Iwabuchi and S. Sonnino. "Photoactivable lactosylceramide derivates: preparation and use in the comprehension of the role of lactosylceramide-enriched micro domain in neutrophils" Gordon Conference on Glycolipid and Sphingolipid Biology, Italy 22-27 April, 2012

35. **E. Chiricozzi**, S. Prioni, V. Chigorno, A. Prinetti and S. Sonnino. "Secondary accumulations of gangliosides in sphingolipidosis" ISN/ESN 2011 23rd Biennal Meeting, held in Athens (Greece), August

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28-September 1, 2011 published in a special issue of J.Neurochem (2011) 118:210 doi: 10.1111/j.1471-4159.2011.07326.x

36. **E. Chiricozzi**, S. Prioni, V. Chigorno, A. Prinetti and S. Sonnino. "Secondary accumulations of gangliosides in sphingolipidosis" 36th FEBS Congress "Biochemistry for tomorrow's medice" Torino, Italy June 25-30, 2011 published in a special issue FEBS Journal, 278: 74–445. doi:10.1111/j.1742-4658.2011.08137.x

37. **E. Chiricozzi**, M. Aureli, N. Loberto, P. Lanteri, V. Chigorno, A. Prinetti and S. Sonnino. "Cell surface glycohydrolase modulation during tumor irradiation" 36th FEBS Congress "Biochemistry for tomorrow's medice" Torino, Italy June 25-30, 2011 published in a special issue: Erratum. FEBS Journal, 278: 1–3. doi: 10.1111/j.1742-4658.2011.08225.x

38. **E. Chiricozzi**, S. Prioni, V. Chigorno, A. Prinetti, S. Sonnino "Secondary accumulations of gangliosides in sphingolipidosis" Convegno annuale della Sezione Ligure-Lomabardo-Piemontese della Società Italiana di Biochimica e Biologia Molecolare, Università del Piemonte Orientale, Novara, Italy, May 20, 2011

39. S. Fernández Fernández, **E. Chiricozzi**, V. Nardicchi, A. Almeida, G. Goracci, J.P. Bolaños. "La fosfolipasa secretora A_2 (isoforma IIA) interviene decisivamente en la apoptosis neuronal inducida por estimulación de receptores NMDA" XXXIII Congresò de La Sociedad Espanola de Bioquimica y Biologìa Molecular, SEBBM2010, Cordoba, September 14-17, 2010

40. S. Prioni, **E. Chiricozzi**, A. Prinetti, M. Piccinini, B. Buccinà, F.Scandroglio, M. Valsecchi, A. Lomartire, E. Lupito, C. Ramondetti, M.T.Rinaudo, S. Sonnino "Deregulated sphingolipid metabolism in neurodegenerative disorders: acid sphingomyelinase knockout mice, an animal model for NPD-A" Convegno annuale della Sezione Ligure-Lomabardo-Piemontese della Società Italiana di Biochimica e Biologia Molecolare, Università dell'Isumbria, Varese, Italy, May 28, 2010

41. V. Nardicchi, E. Biagioni Angeli, M. Ferrini, **E. Chiricozzi**, G. Goracci "Brain low molecular weight phospholipases A_2 ($sPLA_2$): role in neuronal functions and in neurodegenerative diseases" 54th National Meeting of the Italian Society of Biochemistry and Molecular Biology (SIB), Catania, Italy, 23-27 September 2009

42. G. Goracci, V. Nardicchi, M. Ferrini, E. Biagioni-Angeli, **E.Chiricozzi** "Role of low molecular weight phospholipases A_2 in brain functions and dysfunctions" ISN/APSN Joint Meeting Satellite Conference on: Novel Strategies for Intervention in Neurodegenerative Diseases, Academia Sinica, Taipei, Taiwan August 30-September 2, 2009

43. **E. Chiricozzi**, S. Fernandez-Fernandez, A. Almeida', J.P. Bolaños, G. Goracci "Group IIA secretory phospholipase A_2 ($sPLA_2$-IIA) activation contributes to apoptosis after NMDA-receptor over-activation in primary neurons" 18th European Society for Neurochemistry Meeting - 4th Conference on "Advances in Molecular Mechanisms of Neurological Disorders", Leipzig, Germany 11-14 July 2009, published in a special issue of *J.Neurochem* 110:20 (2009) Supplement 1 July 2009 (doi: 10.1111/j.1471-4159.2009.06064_6.x

ORAL PRESENTATIONS .

1. 25th International Symposium on Glycoconjugates, to be held in Milano, Italy, August 25-31, 2019. Invited speaker

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"Interaction between neuronal membrane components as a new therapy for Parkinson's disease"

2. Membrane Protein Workshop, Italian Society of Biochemisty, Università della Calabria, Cosenza, Italy, June 27-28, 2019
   "GM1 neuro properties are due to the plasma membrane interaction between GM1 oligosaccharide and TrkA receptor"

3. Department of Pharmacology, Physiology and Neuroscience, Rutgers – New Jersey Medical School, Newark, NJ, US, March 8, 2019
   Invited speaker
   "New therapy for treatment of Parkinson's Disease: interaction between neuronal membrane components"

4. Gordon Research Conference – Glycolipid and Sphingolipid Biology on the Biochemistry, Biophysics and Physiology of Glycolipid and Sphyngolipid Biology, Galveston, TX, USA, February 11-16, 2018.
   Invited speaker
   "Ganglioside neurotrophic properties and the microenvironment of TrkA in neuroblastoma cells"

5. 1st International Conference on the Glycobiology of Nervous System From the Genome Research Era to the Glycome, Korea University, Seoul, Korea, September 2-5, 2017.
   Invited speaker
   "GM1 oligosaccharide neurotrophic properties"

6. 24th International Symposium on Glycoconjugates, Jeju, Korea August 27 –September 1, 2017.
   Glyco XXIV Award
   "The Neurotrophic properties of GM1 oligosaccharide: a new promising story"

7. ISN-ESN Meeting, Paris, France August 20-24, 2017.
   Young Member Simposia Award ESN
   "GM1 neurotrophic properties are related to GM1 oligosaccharide TrkA-Interaction in mouse neuroblastoma cells"

8. III° Incontro dei Giovani Biochimici dell'area Milanese, Palazzo Feltrinelli, Gargnano, Garda, Italy June, 25-27, 2017.
   "The neurotrophic properties of GM1 oligosaccharide: a new promising story"

9. II° Giornata Scientifica del Gruppo delle Membrane, Italian Society of Biochemisty, Orto Botanico, Università di Catania, Catania, Italy, June 12, 2017
   "The neurotrophic properties of GM1 oligosaccharide: a new promising story"

10. BIOMETRA's Seminars, Department of Medical Biotechnology and Translational Medicine, University of Milano, Italy, March 1, 2017
    Invited speaker
    "GM1 neurotrophic properties are related to GM1 oligosaccharide – TrkA interaction"

11. NAIST, Nara, Japan, November 24, 2016
    Invited speaker
    The neurotrophic properties of GM1 ganglioside: a new study

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12. International Society for Neurochemistry/American Society for Neurochemistry (ISN/ASN) Satellite meeting "Unveiling the Significance of Lipid Signaling in Neurodegeneration and Neuroprotection", Cancun, Mexico, April 17-19, 2013
    Young Investigator Award - "Porcellati Foundation Young Investigator Lecture"
    "Effect of the pharmacological chaperone "Pyrimethamine" on ß-Hexosaminidase activity in Sandhoff fibroblasts"

13. Tohoku Pharmaceutical University, Sendai, Miyagi, Japan, August 16, 2012
    Invited speaker
    Topic 1: LacCer with long fatty acid and cell signaling in neutrophil functions.
    Topic 2: Use of Pyrimethamine, a pharmacological chaperon, for the treatment of Sandhoff Disease.

14. 24th Annual meeting of PhD School in Biochemistry of Italian Society of Biochemistry, Brallo di Pregola, Pavia, Italy June 10-14, 2012
    "Lyn-coupled LacCer-enriched lipid rafts in neutrophilis: a possible organization"

COURSES

June 19-21, 2018
Laboratory animal science introductive course, Istituto di Ricerche Farmacologiche M. Negri, Milano, Italy

May 22-24, 2018
XL ALEMBIC Theoretical and Practical Course of Optical and Electron Microscopy, ALEMBIC, San Raffaele Hospital, Milano, Italy

November 2017
Radiochemistry course, Rutgers University, Newark, NJ, USA

February 16-20, 2015
Brain Blood Barrier (BBB) Training, Université Artois, Artois, Francia

October 2014
Basic methodologies for the innovation in diagnosis and therapy of multifactorial diseases-MbMM, CNR, Milano, Italy

February 9-23, 2011
Bioinformatics course (MOE 2011), University of Milano

August 2011
Radiochemistry course, Juntendo University, Tokyo

TECHNICAL SKILL AND COMPETENCES .

My unique collaborative spirit has made me able in adapting to diverse scientific and multi-cultural environments. From these challenging but rewarding experiences, I acquired both organizational and managerial skills that are essential to lead my current research group "the OligoTeam", which is composed by two PhD students, one Postdoctoral fellow and two research technicians. Moreover, the broad collaborative networks to which I participated in, at both domestic and international institutes, will certainly give an important support to my research projects.

From to the many years of experience in biochemistry and neurochemistry labs, I developed the scientific knowledge, methodological skills and never-ending enthusiasm and motivation for these fascinating fields of biology.

The research conducted in these years has required the use of multidisciplinary approaches consisting in chemical and biochemical techniques, and molecular and cellular procedures.
Experience in the following laboratory techniques has been acquired: primary neuronal cultures preparation; cell lines culture; cell extraction from human blood; human brain blood barrier (hBBB) preparation; cell transfection (silencing and overexpressing); labeling of cells with radioactive and photoactivable compounds; flow cytometry; determination of enzyme activities with fluorogenic and radiolabeled substrates; protein immunoprecipitation; western blotting; tissue and cell lipid analysis; immunocytochemistry; immunofluorescence; HPLC-MS/MS analysis; molecular biology; expression of recombinant proteins; gene editing from E. coli genome; in vivo experiments; in vivo behavioural tests.

Expert in using most Microsoft Office and Macintosh software, Origin Lab, GraphPadPrism, X-calibur, MOE-2011 program. Very good experience in acquisition of bibliography from data bases by Internet.

Languages

- Italian (native)
- English (B2, fluent)
  - January-March 2017- *Berlitz Schools, Milano, Italy*
  - July 5-23, 1999 - *Summer School, City of Bath College, England*
  - July 4-24, 1998 - *ABC Language Schools, The Old School, Furness Road, Eastbourne, England*
  - July 8-22, 1995 - *Stafford House, School of English, Canterbury, England*
- Spanish (fluent)

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Place and date: Segrate, 3/12/2019

SIGNATURE