PERSONAL INFORMATION

Ambra Del Grosso

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Research group website: http://web.nano.cnr.it/neurosens/

Date of birth | Nationality Italian

ACADEMIC EXPERIENCE

From 8/11/2018 to now

Research fellow

Scuola Normale Superiore of Pisa (SNS; https://www.sns.it/; contratto regionale. n. 393 del 12/11/2018)

Projects

- Continuation of the PhD project:
  - testing of a nanovector mediated enzyme replacement therapy (developed during the PhD) for Globoid Cell Leukodistrophy (GLD) in cellular and murine models of the disease;
  - testing autophagy modulators in cellular and murine models of GLD (Project supported by European Leukodistrophy associaction, ELA, see the “award section” of this CV).
- Molecular design and testing of SAW (surface acoustic wave) - based biosensors for the determination of molecular biomarkers (miRNAs and/or proteins) and for the early diagnosis in different kind of neurodegenerative diseases and cancer.
- CRISPR/Cas9 or Cas12 system projecting and testing for the development of new detection methods (diagnostic) and new cellular models.

From 31/10/2014 to 31/10/2018

PhD student (Biophysical sciences)

Scuola Normale Superiore of Pisa (SNS)

PhD project (thesis will be discussed within 2019): development of a nanovector mediated enzyme replacement therapy (ERT) for Globoid Cell Leukodistrophy, a rare neurodegenerative and demyelinating disease. I also investigated if a dysfunction of the autophagy process could be related with GLD pathogenesis and with the nanovector trafficking.
Examinations taken (1 and 2 year of PhD): Quantum mechanics, Biophysics 1, Biophysics 2, Biophysical principles of Neuroscience (all in English language).
Formation courses: English course (level B2), English for writing and presenting research papers, Italian and European legislation on laboratory animals (Experimental Biomedicine Center).

From 10/2012 to 10/2014

Master thesis internship

Retrovirus centre, department of translational research, university of Pisa (UNIPI)

Thesis project: development of a new approach of gene therapy for a rare genetic disease (Primary ciliary dyskinesia, PCD), performed by site-specific recombination mediated by transcription activator-like effector nucleases (TALENs). This study demonstrated that gene editing can rescue ciliary beating (supervisor: Prof. Pistello Mauro).

From 10/2010 to 11/2011

Bachelor thesis internship

Microbiology section, department of translational research, university of Pisa (UNIPI)

Thesis project: development of a PCR-based technique for the molecular characterisation of Mycobacterium Tuberculosis’s strains (Supervisor: Dr. Rindi Laura).

EDUCATION AND TRAINING

From 1/4/2016 to 6/4/2016

International astrocyte school of Bertinoro

Certificate of attendance

International astrocyte school (IAS), Bertinoro, Forlì-Cesena, Italy.

- Gliotransmission in health and disease

From 11/2011 to 10/2014

Master's Degree in Molecular and Cellular Biology

110/110

University of Pisa, UNIPI (Italy)

- Molecular biology and biotechnology

From 10/2008 to 11/2011

Bachelor's Degree in Biological and Molecular Science

105/110

University of Pisa, UNIPI (Italy)

- Maths, physics, biology and chemistry

From 9/2003 to 7/2008

High school diploma in scientific studies

90/100

Liceo Scientifico Vallisneri (Lucca, Italy)

- Maths, physics, biology and chemistry
- Italian literature and philosophy

PERSONAL SKILLS

Mother tongue(s): Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2
	B1 level certification				
French	A1	A2	A1	A1	A1
	High school studies				

Communication skills

During my Master's degree and PhD:

- I have participated to many International meeting, conferences and Schools (Italy, Spain, Denmark, Germany, Greece and USA), developing the capability of interact and discuss with people in multicultural environments.
- I developed the capacity of expose my scientific results to different kind of audience with digital presentation.

Organisational / managerial skills

- During my Master's degree and PhD I have acquired skills and competences for organizing my work and that of bachelor's and master's degree students. I followed the work of 1 bachelor's and 4 master's degree students (1 master's at the moment).
  - Lucia Angella (thesis link: https://etd.adm.unipi.it/t/etd-01282016-163943/)
  - Elisa Petri (thesis link: https://etd.adm.unipi.it/t/etd-03072017-183033/)
  - Alice Bettelli (thesis link: https://morethesis.unimore.it/theses/available/etd-10122017-083808/)
- I am capable to help in the administration of small budgets to purchase materials needed for research
- I am capable to monitor the products needed in a molecular biology laboratory and to organise the subsequent order (I am responsible for the ordering of the molecular biology products of my institute from 2 year).
- I am responsible to manage the Twitcher mice colony in collaboration with the veterinary of our institute.

Job-related skills

Expertise in:

- extraction of nucleic acids from blood, fluids, cell cultures and tissues;
- electrophoretic analysis of nucleic acids; PCR, nested PCR, RT-PCR, rolling circle PCR, Real-Time PCR, Digital PCR; digestion and sequencing of nucleic acids; DNA purification from agarose gel; spectrophotometric quantification of nucleic acids;
- transformation of bacterial cells; production of competent bacterial cells; cloning in plasmids and viral vectors;
- cell culture (immortalized and not); cell transfection (PEI, calcium phosphate, lipofectamine, electroporation);
- flow cytometry assays and cells sorting;
- luciferase assay;
- design and testing of TALEN and CRISPR/Cas system for editing gene and gene regulation;
- western Blot; recombinant protein production and purification (FPLC and gravity column chromatography);
- lipid extraction from cell and tissue;
- confocal imaging;
- ability to work with mouse models in vivo (drug administration through intraperitoneal injection, animal perfusion and fixed organs extraction, flash freezing and organs extraction for microdissection and proteomics analysis), production of primary fibroblast and astrocyte cultures;
- ability in vibratome organs sectioning and following immunohistochemistry analysis;
- immunocytochemistry;
- fluorimeter analysis.

Digital skills

- Knowledge of MS Windows and MAC OS environments.
- Expertise in the use of Microsoft Office tools (Word, Excel and PowerPoint) and Adobe tools (Illustrator and Photoshop).
- Expertise in the use of Bioedit and other programs for the analysis of nucleic acid and amino acid sequences, CLC Main Workbench for the *in silico* design of DNA cloning, CELLQuest Pro for the analysis of results obtained by flow cytometry (FACS), ImageJ for confocal microscopy and images elaboration and Prism for statistical analysis.
- Expertise in the use of *in silico* databases (NCBI, UCSC, ENSEMBL, UNIPROT).
- In possession of the following modules of the European Computer Driving Licence (ECDL): use of the computer and managing files, word processing, spreadsheet and computer networks.

ADDITIONAL INFORMATION

Publications

- Pellegrini, D., **Del Grosso, A.,** Angella, L., Giordano, N., Dilillo, M., Tonazzini, I., ... & McDonnell, L. A. (2019). Quantitative Microproteomics Based Characterization of the Central and Peripheral Nervous System of a Mouse Model of Krabbe Disease. *Molecular & Cellular Proteomics*, mcp-RA118.

- Begarani, F., D'Autilia, F., Signore, G., **Del Grosso, A.**, Cecchini, M., Gratton, E., ... & Cardarelli, F. (2019). Capturing Metabolism-Dependent Solvent Dynamics in the Lumen of a Trafficking Lysosome. ACS nano.

- Galliani, M., Santi, M., **Del Grosso, A.,** Cecchettini, A., Santorelli, F. M., Hofmann, S. L., ... & Signore, G. (2018). *Cross Linked Enzyme Aggregates as Versatile Tool for Enzyme Delivery: Application to Polymeric Nanoparticles. Bioconjugate chemistry*.

- Parenti, N., **Del Grosso, A.,** Antoni, C., Cecchini, M., Corradetti, R., Pavone, F. S., & Calamai, M. (2017). *Direct imaging of APP proteolysis in living cells. PeerJ*, *5*, e3086.

- **Del Grosso, A.,** Antonini, S., Angella, L., Tonazzini, I., Signore, G., & Cecchini, M. (2016). *Lithium improves cell viability in psychosine-treated MO3. 13 human oligodendrocyte cell line via autophagy activation. Journal of neuroscience research*, *94*(11), 1246-1260.

- Lai, M., Pifferi, M., Bush, A., Piras, M., Michelucci, A., Di Cicco, M., **Del Grosso A.,**... & Franceschi, S. (2016). *Gene editing of DNAH11 restores normal cilia motility in primary ciliary dyskinesia. Journal of medical genetics*, *53*(4), 242-249.

- **Del Grosso, A.,** Antonini, S., Tonazzini, I., Signore, G., & Cecchini, M. (2015, August). *Galactosylceramidase (GALC) enzymatic activity and psychosine accumulation in central and peripheral nervous system cells and tissues from wild-type and Twitcher mice. GLIA* (Vol. 63, pp. E163-E164). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY-BLACKWELL.

- **Del Grosso, A,** et al*. Dysregulated autophagy as a new aspect of the molecular pathogenesis of Krabbe disease.* (Submitted to *Neurobiology of disease*).

- **Del Grosso, A,** et al., *Brain-targeted enzyme loaded nanoparticles: a breach through the blood brain barrier for enzyme replacement therapy in Krabbe disease.* (Submitted to SCIENCE ADVANCES).

Abstract presented in international conferences

Poster presentation:

- **Del Grosso Ambra**, et al. *"Nanoparticle-mediated Enzyme Replacement Therapy and Autophagy Modulation: a new perspective for Krabbe disease."* CNR-Nano Meeting (Pisa, 2018).
- **Del Grosso Ambra**, et al. *"Nanoparticle-mediated Enzyme Replacement Therapy and Autophagy Modulation: a new perspective for Krabbe disease."* NanoBio meeting (Heraklion, 2018).
- **Del Grosso Ambra**, et al. *"Impaired autophagy as a new aspect involved in the molecular pathogenesis of Krabbe disease."* FENS meeting (Berlino, 2018).
- **Del Grosso Ambra**, et al. *"Moving towards a novel nanovector-mediated enzyme replacement therapy for Globoid Cell Leukodystrophy (GLD)."* Gordon Research Conference on LSD (Lucca, 2017).
- **Del Grosso Ambra**, et al. *"Li improves cell viability in psychosine treated MO3.13 human oligodendrocyte cell line via autophagy activation".* FENS meeting (Copenaghen, 2016).
- **Del Grosso Ambra**, et al. *"Galactosylceramidase (GALC) enzymatic activity and psychosine accumulation in central and peripheral nervous system cells and tissues from wild-type and Twitcher mice."* Glia meeting (Bilbao, 2015).

- Galliani Marianna, Santi Melissa, **Del Grosso Ambra**, et al. *"Cross linked enzyme aggregates as versatile tool for enzyme delivery: application to polymeric nanoparticles".* NanoBio meeting (Heraklion, 2018).
- Galliani Marianna, Santi Melissa, **Del Grosso Ambra**, et al. *"Cross linked enzyme aggregates as versatile tool for enzyme delivery: application to polymeric nanoparticles."* ANNIC 2018 (Berlino, 2018).
- Pellegrini Davide, **Del Grosso Ambra**, et al. *"Quantitative microproteomics for the characterization of Central and Peripheral Nervous System of the Twitcher mouse."* ASMS (San Diego 2018).
- Angella Lucia, **Del Grosso Ambra**, et al. *"Nanoparticle-mediated Enzyme Replacement Therapy and Autophagy Modulation in Globoid Cell Leukodystrophy".* FENS meeting (Berlino, 2018).
- Pellegrini Davide, **Del Grosso Ambra**, et al. *"Krabbe disease: quantitative microproteomics on specific histological brain regions of the Twitcher mouse"* MSACL EU (Salzburg, 2017).

- Galliani Marianna, Santi Melissa, Cecchettini Antonella, **Del Grosso Ambra**, et al. *"A new strategy for efficient enzyme loading into polymeric nanoparticles for enzyme replacement therapies".* 8th International Nanomedicine Conference (Sydney, 2017).

Awards

Winning of the two years fellowship of the ELA International association (grant agreement no: 2018-008F2; amount funded: 56000 euro) with a project entitled "*Pre-clinical testing of single and combined autophagy modulation by Lithium and Rapamycin in Globoid Cell Leukodystrophy*"). Fellowship will start the 1-6-2019 in the Istituto Nanoscience-CNR of Pisa (legal grant officer: Prof. Lucia Sorba.)

References

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Pisa, May 3th, 2019.