EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Università degli Studi di Napoli "Federico II"	BSc	26/10/2006	Biological Sciences
Università degli Studi di Napoli "Federico II"	MSc	20/10/2008	Molecular Biology
Università degli Studi di Napoli "Federico II"	PHD	27/01/2012	Model Systems in Biomedical and Veterinary Research
Telethon Institute of Genetics and Medicine (TIGEM) Pozzuoli (NA)	Postdoctoral	2012-2020	Cell Biology and Diseases Mechanisms
Institute for Genetic and Biomedical Research (IRGB) - National Research Council-CNR-Milan-ITALY	Principal Investigator	07/2020-to date	Genetic and Biomedical Research
Telethon Institute of Genetics and Medicine (TIGEM) Pozzuoli (NA)	Assistant Investigator	09/2020-to date	Cell Biology and Diseases Mechanisms

A. Personal Statement

I am an Assistant investigator at TIGEM and my work is focused on the study of the contribution of membrane trafficking and phosphoinositides metabolism to organelle homeostasis in order to decipher the molecular basis of inherited diseases. I worked for several years in the field of Biomedicine at the Telethon Institute of Genetics and Medicine (TIGEM), where I started as a postdoc after a PhD in Developmental Biology at the Stazione Zoologica Anton Dohrn in Naples. During the PhD, I also spent one year in Lyon, in the laboratory of Prof. Vincent Laudet at the Institute of Functional Genomics in Lyon (France), where I characterized the function of an orphan nuclear receptor (CiNR1) as a bona fide thyroid hormone receptor of the ascidian *Ciona intestinalis*. After three years as EvoDevo biologist, I joined TIGEM as Postdoctoral Fellow in the lab of M.A. De Matteis where I focused my research interest on the study of the basic cell biology aspects of Lowe Syndrome and on the development of new therapy for this disease(1–3). Most of my work has been carried out in the context of this rare multisystemic neuromuscular-kidney disease, for which in the last years I contributed to the identification of a new cellular role for OCRL (in autophagosome-lysosome fusion) and worked on the development of microscopy-based phenotypical screening (by High Content microscopy). This approach led to the identification of drugs that in cells from Lowe patients were able to rescue disease-relevant phenotypes. Then I worked to translate in vivo the results obtained in vitro by using the mouse model of Lowe syndrome, which I also contributed to characterize. Other interests regard the study of intracellular trafficking of autophagic proteins and the regulation of key cellular functions, such as protein synthesis and their dependence on nutrient availability. I acquired a strong expertise in the cell biology of membrane trafficking, phosphoinositide metabolism and cutting-edge microscopy. My expertise and research interests include human genetics, molecular therapy, molecular and cellular biology, with a particular interest in intracellular trafficking (endolysosomal and autophagy pathways)(4). My laboratory is also currently developing kidney organoids to model Fabry Disease and Cystinosis and to define the spatiotemporal progression of two Lysosomal storage diseases. The use of hESCs and patient-derived iPSCs to differentiate specific cell lines (muscle cells, cardiomyocytes, kidney epithelial cell lines) and 3D systems such as spheroids and kidney organoids is a growing interest and expertise of the laboratory and is used to generate more physiologically relevant in vitro model to study inherited diseases.

Citations:

1. de Leo MG, Staiano L, Vicinanza M, Luciani A, Carissimo A, Mutarelli M, et al. Autophagosome-lysosome fusion triggers a lysosomal response mediated by TLR9 and controlled by OCRL. Nature Cell Biology. 2016;18(8).

2. de Matteis MA, Staiano L, Emma F, Devuyst O. The 5-phosphatase OCRL in Lowe syndrome and Dent disease 2. Nature Reviews Nephrology. 2017;13(8).
3. Festa BP, Berquez M, Gassama A, Amrein I, Ismail HM, Samardzija M, et al. OCRL deficiency impairs endolysosomal function in a humanized mouse model for Lowe syndrome and Dent disease. Human molecular genetics. 2019;28(12).
4. Gambardella G, Staiano L, Moretti MN, de Cegli R, Fagnocchi L, di Tullio G, et al. GADD34 is a modulator of autophagy during starvation. Science Advances. 2020;6(39).

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2020-to date	**Researcher (tenured)**, Institute for Genetic and Biomedical Research (IRGB), National Research Council (CNR), Milan, Italy.
2020-to date	**Assistant Investigator**, Kidney Organoids Laboratory, TIGEM
2020 -to date	**Lecturer,** European School of Molecular Medicine (SEMM), Naples – Milan, Italy
2020-to date	Member, European Association for the Study of Diabetes
2018 – 2019	Currency review Editor, Cell Biology & Genetics section (Reference Module in Life Sciences) Elsevier
2012-2020	**Postdoctoral fellow**, TIGEM. (A. De Matteis lab)
2012-to date	Member, Italian society of Biochemistry and Molecular biology
2011	**Visiting PhD student**, Institute of functional genomics (IGFL), Lyon, FRANCE
2009-2012	**Ph.D. Student** in Model Systems in Biomedical and Veterinary Research (Supervisor Pr. R. Di Lauro), University of Naples Federico II, Naples, ITALY
2009-to date	Member, Italian association for Cell biology and differentiation (ABCD)
2009-2012	Member, Associazione Italiana per lo studio degli animali da laboratorio (FELASA constituent)

Honors

2020-2023	Telethon Start-up installation Grant (PI)
2017	Lowe Syndrome Trust Research Grant (Co-PI)
2012	FEBS travel grant
2011	EMBO Short Term Fellowship

C. Contributions to Science

1. In the last years I contributed to the identification of a new cellular role for OCRL. OCRL encodes for a phosphatidylinositol 4,5 bisphosphate 5-phosphatase and is the gene mutated in Lowe Syndrome. We have described a novel mechanism that is triggered by mitochondrial DNA (mtDNA) delivery to lysosomes occurring when autophagosomes (that can also contain mitochondria) fuse with lysosomes. In this scenario, mtDNA is fragmented in the lysosomal lumen and mtDNA fragments can be recognized by Toll-like receptor 9-TLR9 that activate a signaling cascade culminating with the recruitment of PIP5K1a and b, two phosphoinositide kinases that generate PI4,5P2 on autolysosomal membranes. PI4,5P2 synthesis on autolysosomes is required for proper recycling of autophagosome components (such as the SNARE STX17). However, the levels of autolysosomal PI4,5P2 has to be restricted in time and space and, for this purpose, OCRL is recruited on autolysosomal membranes to consume the PI4,5P2 that, if accumulated have deleterious effects on autophagic flux. I also contributed, in a more translational project, on the identification of potential correctors for Lowe syndrome, by microscopy-based phenotypical screening (by High Content microscopy) on kidney cells. This approach led to the identification of drugs that in Lowe cells were able to rescue disease-relevant phenotypes. Then I worked to translate the *in vitro* results using the mouse model of Lowe syndrome, that I also contributed to characterize.

a) De Leo MG, Staiano L, Vicinanza M, Luciani A, Carissimo A, Mutarelli M, et al. Autophagosome-lysosome fusion triggers a lysosomal response mediated by TLR9 and controlled by OCRL. Nature Cell Biology. 2016;18(8).
b) Festa BP, Berquez M, Gassama A, Amrein I, Ismail HM, Samardzija M, et al. OCRL deficiency impairs endolysosomal function in a humanized mouse model for Lowe syndrome and Dent disease. Human molecular genetics. 2019;28(12).

2. In addition, I also worked on other projects regarding the autophagy pathway. In particular I contributed to projects focused on the role of ER-phagy in the control of procollagen homeostasis, on the intracellular trafficking of autophagic proteins and on the regulation of key cellular functions, such as protein synthesis, in course of nutrient deprivation. In this context I contributed to the identification of a regulatory axis that, through the nuclear translocation of TFEB that increases the expression of GADD34 that, in turn, dephosphorylates p-eIF2a and guarantees the reactivation of protein synthesis when nutrients are absent and global protein synthesis is supposed to be inhibited.

a) Forrester A, de Leonibus C, Grumati P, Fasana E, Piemontese M, Staiano L, et al. A selective ER-phagy exerts procollagen quality control via a Calnexin-FAM134B complex. EMBO Journal. 2019;38(2).
b) Gambardella G, Staiano L, Moretti MN, de Cegli R, Fagnocchi L, di Tullio G, et al. GADD34 is a modulator of autophagy during starvation. Science Advances. 2020;6(39).

Complete List of Published Work at https://orcid.org/0000-0001-7017-1516