

BIOGRAPHICAL SKETCH

NAME: Alessandro Rosa

POSITION TITLE: Associate Professor

EDUCATION/TRAINING:

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date	FIELD OF STUDY
Sapienza University of Rome, Italy	MS	07/2003	Biology
Sapienza University of Rome, Italy	Ph.D.	02/2007	Genetics and Molecular Biology
The Rockefeller University, NY USA	Postdoctoral Associate	10/2010	Stem Cell Biology and Molecular Embryology

A. Personal Statement

My research goal is to elucidate the molecular mechanisms underlying differentiation, development, and neurodegeneration, with a particular focus on the role of non-coding RNA molecules and RNA-binding proteins in these processes. Specifically, my lab aims to characterize the molecular mechanisms driving neuromuscular diseases, such as Amyotrophic Lateral Sclerosis (ALS), using human induced pluripotent stem cells (iPSCs) as an in vitro model system. We have generated a collection of iPSC lines with mutations in RNA-binding proteins (FUS, TDP-43, FMRP) through reprogramming and gene editing. Additionally, we have established protocols for differentiating iPSCs into human motor neurons, cortical neurons, and skeletal muscle cells in both conventional 2D cultures, co-cultures and advanced 3D organoids (cortical and neuromuscular organoids) and bioprinted constructs.

B. Positions, Scientific Appointments, and Honors

Positions and Employment

2003-2007 Doctoral Student / Ph.D. program, Genetics and Molecular Biology, Sapienza University of Rome.

2007-2010 Postdoctoral associate. The Rockefeller University, New York, USA. Long term 2008 Human Frontier Science Program (HFSP) post-doctoral fellowship

2009-2010 Director of the Rockefeller University Stem Cell Derivation Core. New York, USA.

2011-2019 Assistant Professor (tenured in 2014), Sapienza University of Rome.

2019-present Associate Professor, Sapienza University of Rome.

Honors and awards

2006. SIBBM (Italian Society of Biophysics and Molecular Biology) Award

2008. RNA Society 2008 poster award in the category "Genetics and Development"

2012. Bioeconomy Award "For the most innovative Italian intuitions of 2011 in the field of biomedical sciences"

2017. 1st Award at the business plan competition StartCup Lazio

2018. National Prize for Innovation Italy. Special award for best project for Equal Opportunities

C. Contributions to Science

During my PhD and post-doc, I studied miRNAs in hematopoietic differentiation and embryonic development. In 2005, we identified miR-223's role in granulopoiesis, demonstrating miRNAs' regulatory function in cell differentiation. We also revealed complex miRNA-transcription factor interactions in hematopoiesis. I later investigated the miR-430/427/302 family in *X. laevis* and human embryonic stem cells, showing their role in Nodal signaling and mesendodermal lineage promotion. Using iPSCs, we modeled ALS, generating mutant lines and identifying transcriptomic and miRNA pathway changes. In our latest work, we discovered HuD as a key RNA-binding protein playing a role in ALS pathogenesis. Our lab pioneered 3D bioprinting of cortical constructs from human iPSC-derived neural cells and developed the first 3D brain organoids to model fragile X syndrome, advancing tissue engineering and regenerative medicine.

As of September 2025, I authored more than 75 publications in international peer-reviewed journals and two patents, with an h-index of 30 and more than 4,000 citations (sources: Scopus and WOS).

Full list of publications: <https://orcid.org/0000-0001-9999-7223>

Scopus Author ID: 9638433400

10 most relevant publications for the present application

- Silvestri B, [...] [Rosa A](#) (2024) HuD impairs neuromuscular junctions and induces apoptosis in human iPSC and Drosophila ALS models. *Nat Commun* 15: 9618
- Garone MG, Salerno D & [Rosa A](#) (2023) Digital color-coded molecular barcoding reveals dysregulation of common FUS and FMRP targets in soma and neurites of ALS mutant motoneurons. *Cell Death Discov* 9: 33
- Silvestri B, Mochi M, Garone MG & [Rosa A](#) (2022) Emerging Roles for the RNA-Binding Protein HuD (ELAVL4) in Nervous System Diseases. *Int J Mol Sci* 23: 14606
- Brighi C, [...] [Rosa A](#)* & Di Angelantonio S* (2021) Novel fragile X syndrome 2D and 3D brain models based on human isogenic FMRP-KO iPSCs. *Cell Death Dis* 12: 498. *Co-last authors
- Garone MG, [...] [Rosa A](#) (2021) ALS-related FUS mutations alter axon growth in motoneurons and affect HuD/ELAVL4 and FMRP activity. *Commun Biol* 4: 1025
- Garone MG, [...] [Rosa A](#) (2020) Proteomics analysis of FUS mutant human motoneurons reveals altered regulation of cytoskeleton and other ALS-linked proteins via 3'UTR binding. *Sci Rep* 10: 11827
- Salaris F, [...] [Rosa A](#) (2019) 3D Bioprinted Human Cortical Neural Constructs Derived from Induced Pluripotent Stem Cells. *J Clin Med* 8: 1595
- De Santis R [...] [Rosa A](#) (2019) Mutant FUS and ELAVL4 (HuD) Aberrant Crosstalk in Amyotrophic Lateral Sclerosis. *Cell Rep* 27: 3818-3831.e5
- De Santis R, [...] [Rosa A](#) (2018) Direct conversion of human pluripotent stem cells into cranial motor neurons using a piggyBac vector. *Stem Cell Res* 29: 189–196
- De Santis R, [...] [Rosa A](#) (2017) FUS Mutant Human Motoneurons Display Altered Transcriptome and microRNA Pathways with Implications for ALS Pathogenesis. *Stem Cell Rep* 9: 1450–1462