Martina Cusan

Contact

Professional Experience

Postdoc Researcher August 2022-March 2025
Prof. Sirio Dupont lab, University of Padova, Italy

- Lead research on the impact of mechanobiological input over mitochondrial dynamics, lipid metabolism, and autophagy, in the context of metastatic cancers.

Postdoc Researcher November 2017 - May 2022
Dr. Lili Wang, City of Hope Cancer Center, California, USA

- Investigated the role of RNA splicing factor mutations over DNA damage response, mitotic stress, and RNA:DNA hybrids formation, in several types of leukemia
- Designed and conducted high-throughput CRISPR/Cas9 screening to identify protein domains essential for RNA splicing factors mutated cell survival under several DNA insults

PhD Researcher January 2014 - September 2017
Dr. Gustavo Baldassarre lab, CRO National Cancer Institute-Aviano, Italy

- Focused on the generation and characterization of breast cancer cell lines cell cycle inhibitor p27 knock-out and driver mutations knock-in over radio- and endocrine-therapy resistance.
- Developed custom Next Generation Sequencing panels for screening cancer mutations in patient samples.

Education

Second-Level University Master in "OMICS - Omic Data Analysis" December 2024 - Ongoing (expected completion October 2025)
University of Padova, Italy

- Specialized in advanced data analysis techniques for genomics, transcriptomics, metabolomics, and single-cell data.
- Focus on using R programming and statistical tools for large-scale biological data analysis.

Course in Scientific Writing for Science Communication "Scrivere di scienza: realizzare un prodotto di divulgazione scientifica" October 2024 - January 2025
Feltrinelli Educational in collaboration with SISSA (Trieste), Italy

- Gained skills in science communication, public outreach, and writing for diverse audiences.
- Focus on storytelling, scientific journalism, and the production of engaging science content

PhD in Molecular Biomedicine January 2014 - May 2017
University of Trieste, Italy

- Thesis: "Significance of p27 in growth and response to therapy in luminal breast cancer. Supervisor: Dr. Gustavo Baldassarre, National Cancer Institute of Aviano, Italy.

Master's Degree in Medical Biotechnology October 2010 - December 2012
University of Trieste, Italy

- Thesis: "Functional characterization of ANKRD26 gene mutations"; Supervisor: Prof. Anna Savoia, Children's Hospital "Burlo Garofolo," Trieste (TS) Italy.

Awards

- **Umberto Veronesi Postdoctoral Fellowship 2024**
- **Umberto Veronesi Postdoctoral Fellowship 2023**
- **Selected Speaker** at ABCD Meeting 2023; Presentation: "Novel small molecule inhibitors of mitochondrial fission regulator Drp1"
- **Congress Poster Award** at American Society of Hematology 63rd Annual Meeting 2021; Presentation: "R-loop associated mitotic stress confers vulnerabilities in splicing factor mutant leukemia"
- **Invited Speaker** at SoCal Genome Stability Symposium 2021; Presentation: "Breaking bad: role of the splicing factor SF3B1 in genomic stability maintenance."

Skills

Technical Skills

- **Molecular biology techniques:**
  - Illumina NGS library preparation
  - Cloning and site-directed mutagenesis
  - Dotblot assay and DNA:RNA hybrids immunoprecipitation
  - genome editing (CRISPR/Cas9; ZincFinger)
  - PCR and Sanger Sequencing
  - RNA extraction and Real time-PCR
  - Digital droplet PCR
- **Cellular biology techniques:**
  - Adherent and suspension cells culture
  - DNA / siRNAs transfection
  - Virus preparation and transduction
  - Proliferation assays (growth curve; proliferation dye)
  - Apoptosis assays (AnnexinV)
  - Survival assays (clonogenic; MTT; CellTiter Glow; Resazurin)
  - Random motility & wound-healing assays, and time lapse microscopy
  - Soft agar
  - Mammospheres assay
- **Immunofluorescence, unfixed chromosomes spread immunolabeling, and confocal microscopy**
- **Flow cytometry**
- **Protein extraction, immunoprecipitation, and western blot**
- **EU incorporation and chromatin immunoprecipitation (ChIP)**
- **High-throughput CRISPR/Cas9 screenings**
- **Comet assay**
- **Murine immune cells isolation from spleen, peripheral blood and bone marrow to perform ex-vivo experiments**
- **Projects Management:** lead cross-functional team, identify and prioritize tasks, manage timelines and research collaborations, mentor peers and junior colleagues
- **Scientific writing and communication**
- **Developing grant proposals**
- **Software & Tools:** ImageJ Fiji, FlowJo, IGV, Snapgene, Adobe Illustrator, R programming, data visualization (R, Excel, Graphpad)

Soft Skills

- **Proactive and problem-solving attitude**
- **Critical thinking**
- **Attention to details**
- **Adaptability & learning agility**
- **Indipendent**
- **Collaborative**
- **Empathy and active listening**
- **Science dissemination and outreach**

Language

- Italian (native)
- English (professional fluency)

Peer-reviewed articles

- Romani P, Benedetti G, Cusan M, Arboit M, Cirillo C, Wu X, Rouni G, Kostourou V, Aragona M, Giampietro C, Grumati P, Martello G, Dupont S. **"A unifying nuclear mechanotransduction system based on MIEF1-dependent mitochondrial fission"**. Nat. Cell Biol. 2024 Dec;26(12):2046-2060. doi: 10.1038/s41556-024-01527-3.
- Cusan M, Shen H, Zhang B, Ilao A, Yang L, Jin M, Fernandez M, Iyer P, Wu Y, Hart K, Guiterrez C, Nik S, Pruett-Miller S, Stark J, Bowman T, Wu C, Lin RJ, Wang L. **"SF3B1 mutation and ATM deletion co-drive leukemogenesis via centromeric R-loop"**. J Clin Invest. 2023 Sep 1;133(17):e163325. doi: 10.1172/JCI163325.
- Cusan M and Wang L. "NEK2, a promising target in TP53 mutant cancer". Commentary in Blood Science; doi: 10.1097/BS9.0000000000000106.

- Viotto D, Russo F, Anania I, Segatto I, Rampioni Vinciguerra GL, Dall'Acqua A, Cusan M, Bomben R, Perin T, D'Andrea S, Musco L, Mattevi MC, Mungo G, Citron F, Schiappacassi M, Massarut S, Barzan L, Nicoloso M, Gerratana L, Sorio R, Franchin G, Giorda G, Sulfaro S, Lucia E, Giacomarra V, Polesel J, Toffolutti F, Canzonieri V, Puglisi F, Gattei V, Vecchione A, Belletti B, Baldassarre G. **"CDKN1B mutation and copy number variation is associated with tumor aggressiveness in luminal breast cancer"**. The Journal of Pathology. 2021Feb;253(2):234-245. DOI: 10.1002/path.5584.
- Cusan M, Mungo G, De Marco Zompit M, Segatto I, Belletti B, Baldassarre G. **"Landscape of CDKN1B Mutations in Luminal Breast Cancer and Other Hormone-Driven Human Tumors"**. Front Endocrinol (Lausanne). 2018;9:393. PMCID: PMC6056726.
- Berton S*, Cusan M*, Segatto I, Citron F, D'Andrea S, Benevol S, Avanzo M, Dall'Acqua A, Schiappacassi M, Bristow RG, Belletti B, Baldassarre G. **"Loss of p27kip1 increases genomic instability and induces radio-resistance in luminal breast cancer cells"**. Sci Rep. 2017 Apr4;7(1):595. PMID: 28377607. *Co-first authors
- Pellizzari I, Fabris L, Berton S, Segatto I, Citron F, D'Andrea S, Cusan M, Benevol S, Perin T, Massarut S, Canzonieri V, Schiappacassi M, Belletti B, Baldassarre G. **"p27kip1 expression limits HRas-driven transformation and tumorigenesis by both canonical and non-canonical mechanisms"**. Oncotarget. 2016 Oct 4;7(40):64560-64574. PMID: 27579539.

Conference presentations

- Cusan M, Romani P, Varricchio C, Brancale A, Dupont S. "Novel small molecule inhibitors of mitochondrial fission regulator Drp1". **Congress poster and selected speaker.** ABCD Meeting. September 2023.
- Cusan M, Jin M, Zhang B, Fernandez M, Ilao A, Yang L, Wu Y, Iyer P, Hart K, Guiterrez C, Stark J, Bowman T, Wu C, Lin RJ, Wang L. "R-loop associated mitotic stress confers vulnerabilities in splicing factor mutant leukemia". **Congress poster award.** ASH 63rd Annual Meeting. December 2021.
- Cusan M "Breaking bad: role of the splicing factor SF3B1 in genomic stability maintenance." **Invited speaker.** Southern California Genome Stability Symposium. September 2021.
- Cusan M, Yin S, Jin M, Guiterrez C, ten Hacken E, Herman S, Rassenti L. Ghia E., Kipps T, Wiestner A, Getz G, Siddiqi T, Rosen S, Wu C, Wang L. "Cooperation between SF3B1 mutations and ATM deletion in CLL development." **Congress poster.** iWCLL 2019.
- Cusan M, Hart K, Jin M, Iyer P, Wang L. "Cooperation between SF3B1 mutations and ATM deletion in CLL development." **Congress poster.** Southern California RNA meeting. April 2019.
- Cusan M, Hart K, Iyer P, Wang L. "Cooperation between SF3B1 mutations and ATM deletion in CLL development." **Congress poster.** ISEH-47th annual scientific meeting. August 2018.
- Iyer P, Cusan M, Hart K, Wang L. "Deciphering the NOTCH Pathway Alterations in Chronic Lymphocytic Leukemia Using Integrated Approaches". **Congress poster.** ISEH-47th annual scientific meeting. August 2018.
- Cusan M, D'Andrea S, Benevol S, Segatto I, Belletti B, Baldassarre G. "Significance of CDKN1B driver mutations in the growth and response to therapy of Luminal Breast Cancer." **Congress poster.** Special Conference EACR AACR SIC. June 2015.

Dissemination activites

- **Public speaking and outreach:** participation as a speaker at the event 'Passione' organized in June 2024 by the local association PUNTO. DIVERSE PROSPETTIVE to share my passion for science and research with the general public; collaborated in organizing interactive scientific themed games during the Science4All events (September 2023 and 2024) organized by the University of Padova, promoting science as an accessible and stimulating experience
- **Mentorship in schools:** meetings with high school students as part of the Umberto Veronesi fellowship (2023 and 2024) to present scientific projects and stimulate interest in STEM careers

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Padova, 15th May 2025