

# Curriculum Vitae

**Marzullo Marta**

## CURRENT POSITION

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01/07/2019-to date      **Postdoctoral Researcher**  
Department of Biology and Biotechnologies “C. Darwin”,  
Sapienza, University of Rome. Italy  
Advisors: Laura Ciapponi and Maurizio Gatti  
Project: “The role of the *pendolino* gene in epigenetic telomere maintenance and its interaction with PEV(Position Effect Veriegation) modifiers ”

## PAST POSITION

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01/01/2018-30/06/2019      **Postdoctoral Researcher**  
Telomere and Genome stability group,  
Insituto Gulbenkian de Ciência (IGC), Oeiras, Portugal  
Advisor: Miguel Godinho Ferreira  
Project: “Age as a Carcinogen – are Telomeres the culprit?”  
I worked on the characterization of the systemic effect of telomere shortening, using the model system *Danio Rerio* (Zebrafish). We use the telomerase mutant (*tert*<sup>-/-</sup>) to dissect the consequences of telomere attrition at cell and tissue level. Ultimately, aiming to define the pathways involved in aging in human and to contribute to find therapy for aging-associated diseases.

15/11/2016- 30/11/2017      **Postdoctoral Researcher**  
Department of Biology and Biotechnologies “C. Darwin”,  
Sapienza, University of Rome. Italy  
Advisors: Laura Ciapponi and Maurizio Gatti  
Project: “Exploiting the *Drosophila* model system to investigate the function of human proteins involved in telomere maintenance”

01/11/2013- 31/10/2016      **PhD student**  
Department of Biology and Biotechnologies “C. Darwin”,  
Sapienza, University of Rome. Italy  
Advisor: Laura Ciapponi and Maurizio Gatti  
Project: “*pendolino* (*peo*), a *Drosophila* gene preferentially required for heterochromatic telomeres protection”

## EXPERTISE AND SKILLS

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**Lab Techniques**      - **Genetics and cytology:**  
**Zebrafish**- Maintaining Zebrafish stock (stocks maintenance, genotyping, crosses, mutant analysis).Genetic screening. Fish organs dissection and fixation. Histopathological analysis of specific tissues and cells (Beta-Gal assay, H&E, IF, etc). Induction of enterocolitis (through anal injection and or oral gavage).

Analysis of the main inflammatory pathways. Analysis of the consequences of telomere shortening.

**Drosophila**- Genetic screening. Culturing of *Drosophila* stocks, formal genetics analysis (stocks maintenance, mutant analysis, recombination, mutation induction). Chromosomes analysis, direct and indirect immunofluorescence. Mitosis and Meiosis analysis

- **Cell biology:** *Drosophila* cell cultures maintenance, transfection and manipulation.

- **Molecular Biology and Biochemistry:** Standard molecular biology techniques to analyze nucleic acids and proteins; DNA and RNA extraction, PCR, RT-PCR, Real-Time PCR, cloning, sequencing analysis, western blotting, protein purification, co-immunoprecipitation, GST-pulldown, ChIP, induction of Cas9 mutation.

### IT skills

Word, PowerPoint, Excel, Photoshop, Image J, FIJI, Image Lab, Sequencer

### Languages

**Italian:** native

**English:** good level spoken and written

## EDUCATION

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24/02/2017

### **PhD degree in Genetics and Molecular Biology**

Department of Biology and Biotechnologies “C. Darwin”,  
Sapienza, University of Rome. Italy

Supervisor: Laura Ciapponi

Thesis title: *pendolino* (*peo*), a *Drosophila* gene preferentially required for “heterochromatic telomeres” protection

Classification: Excellent

**Project:** I used molecular, biochemical and cytological approaches to characterize *Peo* molecular functions. I analyzed the effects of mutations in *peo* on the heterochromatin state and how changes of the epigenetic modifications could impair telomere stability leading to the formation of telomere fusions.

25/07/2013

### **Master's degree in Genetics and Molecular Biology**

Department of Biology and Biotechnologies “C. Darwin”,  
Sapienza, University of Rome. Italy

Thesis title: Role of *pendolino* gene in the heterochromatic telomeres stability in *Drosophila melanogaster*

Supervisor: Laura Ciapponi

Vote: 110/110 summa cum laude

**Project:** I examined the particular telomere fusions phenotype of the *peo<sup>h</sup>* allele analyzing the chromosomes morphology of the larval brain metaphases. I compared *peo* telomere fusion phenotype with those of other telomere mutants. I analyzed the genetic interactions of *peo* with genes encoding for factors involved in heterochromatin and telomere maintenance. I also investigated through immunofluorescence experiments the localization of proteins required for telomere stability in *peo* mutants in different cell types.

28/10/2011

### **University degree in Biology**

Department of Biology and Biotechnologies “C. Darwin”,  
Sapienza, University of Rome. Italy

Thesis title: Identification of mutations in mitotic and telomere genes associated to *Drosophila melanogaster* chromosome II

Supervisor: Laura Ciapponi

Vote: 110/110 summa cum laude

**Project:** I performed a screening on different mutant lines induced with EMS aimed to the identification of new gene involve in chromosomes stability. I analyzed the larval brain metaphases of the different mutants looking for chromosomal defects caused by the EMS-induced mutations. I identified a mutant line with a telomere fusion phenotype; a complementation test revealed that the mutation was a new mutation in the *pendolino* gene.

## INTERNATIONAL PEER-REVIEWED PUBLICATIONS

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**Marzullo M.**, Mosti F., Pellacani C., Gatti M. and Ciapponi L. Interactions between *pendolino* and histone modifiers reveal an epigenetic regulation of *Drosophila* telomere stability. *Manuscript in preparation*.

**Marzullo M.\***, Andreyeva E.N\*., Pellacani C., Ciapponi L and Gatti M. SUUR is a telomere-associated protein that interacts with *Pendolino* and plays a role at *Drosophila* telomeres. *Manuscript in preparation*. \*These authors contributed equally to the work.

*Summary 1+2: This two works represent the follow up of the Plos Genetics 2015 first paper on pendolino, and represent my own work done during the master degree and PhD. In these two papers we characterize the role of pendolino in heterochromatin maintenance and DNA replication, showing for the first time a relationship between histone modification and telomeric fusions. We found that peo interacts with factor required for both heterochromatin formation and replication, and that mutation in peo strongly affect both methylation and ubiquitination of heterochromatin. The results included in these two papers will give a great relevance to Peo and its epigenetic role at telomeres, proving valbel information on the possible role of its human homologue AKTIP.*

Lex K.\*, Gil M.\*, Lopes-Bastos B., Figueira M., **Marzullo M.**, Giannetti K., Carvalho T, Ferreira M.G. Telomere shortening produces an inflammatory environment that increases tumor incidence in zebrafish. **PNAS**. Manuscript accepted, in press June 2020

El Maï M.\*, **Marzullo M.\***, Pimenta de Castro I. and Ferreira M.G. Opposing p53 and mTOR/AKT promote an in vivo switch from apoptosis to senescence upon telomere shortening in zebrafish. **Elife**. 2020 May 19;9:e54935. doi: 10.7554/eLife.54935. \*These authors contributed equally to the work.

Strah N, Romano G, Introna C, Klima R, **Marzullo M**, Ciapponi L, Megighian A, Nizzardo M, Feiguin F. TDP-43 promotes the formation of neuromuscular synapses through the regulation of Disc-large expression in *Drosophila* skeletal muscles. *BMC Biol*. 2020 Mar 26;18(1):34. doi: 10.1186/s12915-020-00767-7.

Razzoli M., Dufe K., Gurney A., Erickson C., McCallum J., Spielman N., **Marzullo M.**, Patricelli J., Kurata M., Touma C., Palme R., Largaespada D., Allison D.B., Bartolomucci A. Social Stress Regulates Lifespan in Mice. **Aging Cell**. 2018 May 28:e12778. doi: 10.1111/accel.12778.

Blum J.A.\*, Bonaccorsi S.\*, **Marzullo M.**, Palumbo V., Barbash D.A. and Gatti M. The Lhr-Hmr complex is required for sister chromatid separation during anaphase but not for centromere/kinetochore function. *Genetics*. 2017;207: 1457–1472. doi:10.1534/genetics.117.300390.

**Marzullo M.**, Gatti M. Telomere fusion in *Drosophila*: The role of subtelomeric chromatin. *Fly (Austin)*. 2015 Jul 3;9(3):121-5. doi:10.1080/19336934.2015.1131882.

Cenci G.\*, Ciapponi L.\*, **Marzullo M.**, Raffa G.D., Morciano P., Raimondo D., Burla R., Saggio I., Gatti M. The Analysis of *Pendolino* (*peo*) Mutants Reveals Differences in the Fusigenic Potential among *Drosophila* Telomeres. PLoS Genet. 2015 Jun 25;11(6):e1005260. doi: 10.1371/journal.pgen.1005260. eCollection 2015 Jun.

## HONORS AND AWARDS

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- 2017 **Best PhD thesis prize** “Ferruccio Ritossa” for the years 2015-2017, awarded by AGI (Associazione Genetica Italiana)  
Thesis title: *pendolino* (*peo*), a *Drosophila* gene preferentially required for “heterochromatic telomeres” protection
- 2015 **Best poster prize** awarded by VI BEMM (Biology and Molecular Medicine PhD School) symposium, Rome 30<sup>th</sup> November 2015 (Annual meeting)  
Title: Functional characterization of *pendolino*, a *Drosophila* gene required for telomere protection and DNA replication

## ORAL COMMUNICATIONS

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*Presenting author underlined*

**Marta Marzullo**, Maurizio Gatti and Laura Ciapponi. Interactions between *pendolino* and histone modifiers reveal an epigenetic regulation of *Drosophila* telomere stability. EMBO Workshop “Telomeres in Health and Human disease” Troia (PT) 1<sup>st</sup>-6<sup>th</sup> May 2018.

**Marta Marzullo**, Evgeniya N. Andreyeva, Maurizio Gatti and Laura Ciapponi. The role of *pendolino* in epigenetic regulation of *Drosophila* telomere capping. I EMBL-SAPIENZA PhD meeting “Chromatin and Epigenetics”, Rome 26<sup>th</sup>-27<sup>th</sup> September 2016.

**Marta Marzullo**, Evgeniya N. Andreyeva, Maurizio Gatti and Laura Ciapponi. Functional characterization of *pendolino*, a *Drosophila* gene required for telomere protection and DNA replication. XVIII Italian *Drosophila* Research Conference (IDRC), Bologna 14<sup>th</sup>-16<sup>th</sup> **September, 2016**.

**Marta Marzullo**, Giovanni Cenci, Grazia D. Raffa, Patrizia Morciano, Domenico Raimondo, Romina Burla, Isabella Saggio, Maurizio Gatti and Laura Ciapponi. *Pendolino* (*peo*), a *Drosophila* gene preferentially required for “heterochromatic telomeres” protection. XVII Italian *Drosophila* Research Conference (IDRC), Anagni (FR) 6<sup>th</sup>-8<sup>th</sup> **October, 2014**.

## POSTER COMMUNICATIONS

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*Presenting author underlined*

**Marta Marzullo**, Evgeniya N. Andreyeva, Maurizio Gatti and Laura Ciapponi. Functional characterization of *pendolino*, a *Drosophila* gene required for telomere protection and DNA replication. EMBO/FEBS lecture course “Chromatin & Environment”, Spetses island (ATH) 8<sup>th</sup>-14<sup>th</sup> **August, 2016**. Poster P46.

**Marta Marzullo**, Giovanni Cenci, Patrizia Morciano, Maurizio Gatti and Laura Ciapponi. Functional characterization of *pendolino*, a *Drosophila* gene required for telomere protection and DNA replication VI BEMM (Biology and Molecular Medicine PhD School) symposium, Rome 30<sup>th</sup> **November 2015** Annual meeting. Poster P33.

**Marta Marzullo**, Giovanni Cenci, Patrizia Morciano, Maurizio Gatti and Laura Ciapponi. Functional characterization of *pendolino*, a *Drosophila* gene required for telomere protection and DNA replication (A-160). XXIV European *Drosophila* Research Conference (EDRC), Heidelberg 9<sup>th</sup>-12<sup>th</sup> **September, 2015**. Poster P35.

**Marta Marzullo**, Giovanni Cenci, Maurizio Gatti and Laura Ciapponi. The analysis of *pendolino* reveals unexpected differences between euchromatic and heterochromatic *Drosophila* telomeres. Conference AGI (Associazione Genetica Italiana), Cortona (SI) 25<sup>th</sup>-27<sup>th</sup> **September, 2013**. Poster 5.7 and short talk.

**Marta Marzullo**, Giovanni Cenci, Maurizio Gatti and Laura Ciapponi. *Pendolino*, a *Drosophila* gene that controls the behavior of heterochromatic telomeres. *XVI* Italian *Drosophila* Research Conference (*IDRC*), Palermo 1<sup>st</sup>-3<sup>rd</sup> **October, 2012**. Poster.