



## Filomena Ristoratore

**Nationality:** Italian **Date of birth:** 15/04/1965

✉ **Email address:** [filomena.ristoratore@szn.it](mailto:filomena.ristoratore@szn.it)

### PRESENT POSITION

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#### Position

[ 01/12/2020 – Current ]

Scientist, Ricercatore II livello- Department of Biology and Evolution of Marine Organisms - Stazione Zoologica Anton Dohrn, Villa

Comunale, 80121 Napoli, Italy

### EDUCATION AND TRAINING

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#### Associate Professor Qualification in Comparative Anatomy and Cytology

[ 05/08/2018 – Current ]

Address: (Italy)

#### PhD (Cellular and Molecular Biology and Pathology )

*Università degli studi di Napoli Federico II, Napoli (Italy)* [ 26/09/1996 ]

Thesis: Title: "Characterization of Hox gene Complex in the ascidian *Ciona intestinalis*."

#### Summa cum Laude Laurea (Biological sciences)

*Università degli studi di Napoli Federico II, Napoli (Italy)* [ 22/07/1988 ]

Thesis: Title: The Role of cellular junction in differentiation of germinal cells and in folliculogenesis

### WORK EXPERIENCE

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#### Staff Scientist (Ricercatore II Livello, TI)

*Stazione Zoologica Anton Dohrn, Napoli* [ 01/12/2020 – Current ]

City: Naples

Country: Italy

Direction of a research group focused on

1. Elucidate the role of nervous system new candidate genes in *Ciona* development by studying their transcriptional regulation and their function by CRISP/Cas9 inactivation.
2. Development and evolution of pigmented sensory organs in chordates
3. Role of antropogenic underwater noise on ascidians development and behaviour.

#### Staff Scientist (Ricercatore III Livello, TI)

*Stazione Zoologica Anton Dohrn* [ 01/05/2000 – 29/11/2020 ]

City: Naples

Country: Italy

■ **2014- to 2022.** Collaboration on a project aimed to study of the "Long non-coding RNAs" and the transposable elements in the *Octopus vulgaris* nervous system. We have studied the presence of a still active transposable element in the *Octopus* genome. expression study of this element suggests its specific enrichment in neurons

associated with behavioral plasticity. Studies are underway to confirm the ability of the isolated element to reverse transcribe

■ **2008- to 2020.** Direction of a research group focused on "Development and evolution of pigmented sensory organs in chordates". We employed for the first time a pigment cell lineage-specific whole genome transcription profiling to characterize the FGF downstream expression program that governs pigment cell formation in the ascidian *Ciona robusta*.

Study on Molgulidae species with different mode of development and different pigmentation patterns, revealed trace of pseugenization mechanisms occurring in the *Molgula occulta* (that lack pigmentation) in pigmentation genes.

■ **2006-2009.** Direction of a research group aimed to search for a stem cell population in the larva of *C. intestinalis*. The study aimed to find and characterize new determinants that regulate the maintenance of neural stem cells in the undifferentiated state and / or the inversion of differentiated neural cells towards the pluripotent state of neural stem cell. Development of a protocol for primary cell culture from dissociated larvae of *C. intestinalis*. It was possible, for the first time, to put in culture and maintain for about two weeks all the cells present in the larva of *Ciona*.

### Research postdoctoral fellow

**"Laboratoire di Genetique des Poissons" dell'INRA** [ 30/09/1997 – 30/12/1999 ]

City: Jouy-en-Josas (Paris)

Country: France

1. ■ Role of engrailed on the medaka fish (*Oryzias latipes*) nervous system regionalization.
2. ■ New techniques for transgenensis in fish.

### Visiting Scientist

**Developmental Biology Programme Group EMBL** [ 14/09/1999 – 29/09/1999 ]

City: Heidelberg

Country: Germany

■ Mutagenesis screening in Medaka fish.

### PhD (Cellular and Molecular Biology and Pathology )

**Università degli studi di Napoli Federico II** [ 02/11/1991 – 26/09/1996 ]

City: Naples

Country: Italy

**Characterization of genes controlling development of the ascidian *Ciona intestinalis*.**

### Research student

**Università degli studi di Napoli Federico II, Department of Evolutionary Biology** [ 05/1987 – 07/1988 ]

City: Naples

Country: Italy

Studies on ultrastructural aspects of oogenesis in *Podarcis s. sicula* raf. Analisis of several cellular junctions during the differenziation of germinal cells and folliculogenesis.

### CNR research fellow

**Consiglio Nazionale delle Ricerche (CNR). Istituto Internazionale di Genetica e Biofisica** [ 11/1989 – 10/1991 ]

City: Naples

Country: Italy

■ Characterization of a chemioreception mutant in the nematode *Caenorhabditis elegans*

- Immunolocalization of cut-1 and cut-2 in *C. elegans*.

## HONOURS AND AWARDS

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### Member of the Scientific Evaluation Panel ATIP Avenir LS3

Inserm [ 2019 ]

### Associate Professor Qualification

[ 2018 ]

Associate Professor Qualification in Comparative Anatomy and Cytology (Abilitazione Scientifica Nazionale Seconda Fascia, settore concorsuale BIO/06 ANATOMIA COMPARATA E CITOLOGIA)

### Member of the Scientific Evaluation Panel ANR

2016-2017 Member, as a scientific expert, of the Scientific Evaluation Panel CE12 "Genetics genomics- RNA committee" of the The French National Research Agency (ANR) 2017

### Fellowship from the National council of research

1989/1991: Fellowship from the National council of research (C.N.R.) (All Fell. 1)

## EDITORIAL ACTIVITIES

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### Review Editor for Invertebrate Physiology, Frontiers in Physiology

[ 2020 - Current ]

### Guest editor Dev Biol

2017-2019: Guest Editor on the Board of the journal Developmental Biology on - "Current Directions in Tunicate Biology"

<https://www.journals.elsevier.com/developmental-biology/call-for-papers/special-issue-on-currentdirections-in-tunicate-biology>

## GRANT SUPPORT

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### JPI Oceans, Underwater noise in the marine environment

[ 2022 - Current ]

Project title: "Deuteronoise: Characterization of maritime noise in different European basins and its impact on ecological relevant deuterostome invertebrates". Role: principal investigator and coordinator for SZN Financial support: € 100.000.

### PON PRIMA

[ 2018 - Current ]

Member of the committee for the PON PRIMA (Potenziamento Ricerca e Infrastrutture Marine) for the OR Genome editing, and cell culture room. reference person for the cell culture room.

## **EU INFRAIA Assemble plus**

[ 2016 – 2022 ]

EU INFRAIA Assemble plus "Association of European Marine Biological Laboratories Expanded". Call: H2020-INFRAIA-2016-2017. The goal is to stimulate European excellence in fundamental and applied research in marine biology and ecology, thereby improving our knowledge- and technology-base for the blue economy. Joint Research Activities (JRA) involving all partners aim to develop innovative new technologies and/or methodologies to be offered to users through the TA programmes. Involved in the Joint Research Activity 3 "Functional genomics" which aim is to improve methods of interference with gene function in marine models. Role: principal investigator and coordinator for SZN JRA3 Financial support: € 133.750.

## **EU Infradev Corbel**

[ 2014 – 2019 ]

"Coordinated Research Infrastructures Building Enduring

Lifescience Services ". EU Horizon 2020 research and innovation programme (GA No 654248). Involved in the project as an expert of ascidian marine models. Role: staff scientist. Financial support: € 90,700.

## **FIRB**

[ 2012 – 2019 ]

(Futuro in Ricerca- MIUR): Non-Coding RNA Explosion: Novel Implications in Neurotrophin Biology (RBFR12QW4I). Involved in this project as an expert of expression analysis and non coding RNA. Principal investigator: Salvatore D'Aniello. Role: staff scientist. Financial support: € 864.000.

## **ABBaCo**

[ 2015 – 2019 ]

"Restauro ambientale e balneabilit. del SIN Bagnoli-Coroglio". Financed by Cipe, Fondo integrativo speciale per la ricerca (FISR) 2015 and 2016. Role staff scientist for WP 4, Financial support: € 30'000,00

## **Ritmare**

[ 2012 – 2017 ]

(MIUR- Progetto Bandiera): 6–WP3 Attivit. di formazione, A2 Predisposizione di Dottorati di Ricerca, Master (I e II livello) e Corsi di perfezionamento sugli argomenti oggetto di ricerca in ambito RITMARE. Role: Principal investigator for WP3. Financial support: €80000

## **Assemble grant**

Received one accesses from ASSEMBLE Transnational Access for access to the Station Biologique de Roscoff with a project entitled "Investigating Mechanisms of Development in a tailless ascidian, *Molgula occulta* (Evolution and Development in *Molgula*, MoEvoDevo)".

## **Assemble grant**

[ 2007 – 2013 ]

"Improving the provision of cultures of marine protists and cell lines of marine animals". Principal investigator: Laura Zanetti. Role: staff scientist involved in the set up of new protocols for primary cell culture from ascidian *Ciona intestinalis*.

## **EC, FP6-STREP PLURIGENES**

[ 2003 – 2009 ]

"Pluripotency associated genes to de-differentiate neural cells into pluripotent cells". Role: principal investigator (coordinator of SZN unit). Financial support: € 210,000.

## Network of Excellence (NoE) Marine Genomics Europe

[ 2003 – 2009 ]

Role: Staff scientist

### COMMUNICATION AND INTERPERSONAL SKILLS

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#### Communication and interpersonal skills

excellent communication skills testified by (i) invitation as speaker to Conference, Departmental Seminars, (ii) Teaching and (iii) Outreach activities

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### MANAGEMENT AND LEADERSHIP SKILLS

#### Organisational / managerial skills

Leadership skills gained as responsible for research teams of 3-5 people including postdocs, PhDs and undergraduate students.

■ Organizational skills gained through: (i) PI, or WP coordinator for EU financed project; (ii) the participation to several Committee and Panels;

■ Service and Committee Work performed at SZN since 2000 and through the organization of international Meetings,

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### PATENT

#### “Random integration of a polynucleotide by in vivo linearization”

Possessor of international US patent number 7098031 (publication August 29, 2006) and international Patent number 20030106077 ( June 5, 2003 ) entitled: “Random integration of a polynucleotide by in vivo linearization”.(Patent 1US and Patent1\_international).

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### PUBLICATIONS

1. Petrosino G., Ponte G., Volpe M., Zarrella I., Ansaloni F., Langella C., Di Cristina G., Finaurini S., Russo MT, Basu S., Musacchia F., Ristoratore F., Pavlinic D., Benes V, Ferrante MI, Albertin C, Simakov O, Gustincich S, Fiorito G, Sanges R. (2022) Identification of LINE retrotransposons and long non-coding RNAs expressed in the octopus brain. **BMC biology** 20, 1-22
2. Lowe E. K, Racioppi, C.,Peyri ras N., Ristoratore F., Christiaen L., Swalla BJ,Stolfi A. (2021) A *cis*-regulatory change underlying the motor neuron-specific loss of *Ebf* expression in immotile tunicate larvae. **Evolution & Development** 23, 72-85
3. Olivo P., Palladino A., Ristoratore F., Spagnuolo A. (2021) Brain sensory organs of the ascidian *Ciona robusta*: structure, function and developmental mechanisms. **Frontiers in Cell and Developmental Biology**, 2435
4. Macel ML., Ristoratore F., Locascio A., Spagnuolo A., Sordino P., D’Aniello S (2020). Sea as a color palette: the ecology and evolution of fluorescence. **Zoological Letters**, 6, 1-11
5. Caccavale F., Coppola U., Vassalli Q A., La Vecchia C., Palumbo A., D’Aniello E., Locascio A., Ristoratore F., D’Aniello S.. (2020) Transphyletic conservation of nitric oxide synthase regulation in cephalochordates and tunicates. **Development Genes and Evolution**. 230, 329-338
6. Coppola U., Olivo P., D’Aniello E., Johnson C. J., Stolfi A., Ristoratore F. (2020) Rimbp, a New Marker for the Nervous System of the Tunicate *Ciona robusta*. **Genes** 11, 1006
7. Liberti A., Bertocci I., Pollet A., Musco L., Locascio A., Ristoratore F., Spagnuolo A., Sordino P. (2020) An indoor study of the combined effect of industrial pollution and turbulence events on the gut environment in a marine invertebrate. **Marine Environmental Research**, 158: 104950

8. Coppola U., Kamal AK., Stolfi A., Ristoratore F. (2020) The cis-regulatory code for kelch-like 21/30 specific expression in *Ciona robusta* sensory organs. **Frontiers in cell and developmental biology**, 903
9. Coppola U., Ristoratore F., Albalat R., D'Aniello S. (2019) The evolutionary landscape of the Rab family in chordates. **Cellular and Molecular Life Sciences**, 76: 4117-4130
10. Racioppi C., Coppola U., Christiaen L., Ristoratore F. (2019) Transcriptional regulation of Rab32/38, a specific marker of pigment cell formation in *Ciona robusta*. **Developmental biology**. 448, 111-118
11. Nittoli V., Fortunato A E., Fasano G., Coppola U., Gentile A., Maiella S., Langellotto F., Porreca I., De Paolo R., Marino R., Fiengo M., Donizetti A., Aniello F., Kondo T, Ristoratore F., Canzoniero L MT, Duboule D., Wilson S. W, Sordino P. (2019) Characterization of paralogous uncx transcription factor encoding genes in zebrafish. **Gene**, 721 : 100011
12. Coppola U, Caccavale F, Scelzo M, Holland N D, Ristoratore F, D'Aniello S (2018) Ran GTPase, an eukaryotic gene novelty, is involved in amphioxus mitosis. **Plos One**, 13e0196930
13. Nittoli V, Sepe RM, Coppola U, D'Agostino Y, De Felice E, Palladino A, Vassalli QA, Locascio A, Ristoratore F, Spagnuolo A, D'Aniello S, Sordino P (2018) A comprehensive analysis of neurotrophins and neurotrophin tyrosine kinase receptors expression during development of zebrafish. **Journal of Comparative Neurology** 526, 1057–1072.
14. Burguera D, Marquez Y, Racioppi C, Permanyer J, Torres-Mendez A, Esposito R, Albuixech-Crespo B, Fanlo L, D'Agostino Y, Gohr A, Navas-Perez E, Riesgo A, Cuomo C, Benvenuto G, Christiaen LA, Marti E, D'Aniello S, Spagnuolo A, Ristoratore F, Arnone MI, Garcia-Fernandez J, Irimia M (2017). Evolutionary recruitment of flexible Esrp-dependent splicing programs into diverse embryonic morphogenetic processes. **Nature Communications** 8, 1799
15. Racioppi C, Valoroso M C, Coppola U, Lowe EK, Titus Brown C, Swalla BJ, Christiaen L, Stolfi A and Ristoratore F\*. (2017). Evolutionary loss of melanogenesis in the tunicate *Molgula occulta*. **EvoDevo** 8:11
16. Tamarro S, Simoniello P, Ristoratore F Coppola U, Scudiero R, Motta C M. (2017) Expression of caspase 3 in ovarian follicle cells of the lizard *Podarcis sicula*. **Cell and Tissue Research** 367,397-404
17. D'Agostino Y, Locascio A, Ristoratore F, Sordino P, Spagnuolo A, Borra M, D'Aniello S. (2016) A Rapid and Cheap Methodology for CRISPR/Cas9 Zebrafish Mutant Screening. **Mol Biotechnol**. 58:73-8
18. Coppola U, Annona G, D'Aniello S\*, Ristoratore F\*. (2016) Rab32 and Rab38 genes in chordate pigmentation: an evolutionary perspective. **BMC evolutionary biology** 16, 1
19. Brozovic M, Martin C, Dantec C, Dauga D, Mendez M, Simion P, Percher M, Laporte B, Scornavacca C, Di Gregorio A, Fujiwara S, Gineste M. Lowe EK, Piette J, Racioppi C, Ristoratore F, Sasakura Y, Takatori N, Brown T.C, Delsuc F, Douzery E, Gissi C, McDougall A, Nishida H, Sawada H, Swalla BJ, Yasuo H, Lemaire P. (2015) ANISEED 2015: a digital framework for the comparative developmental biology of ascidians. **Nucleic Acids Res**, Jan 4;44
20. Crocetta F, Marino R, Cirino P, Macina A, Staiano L, Esposito R, Pezzotti MR, Racioppi C, Toscano F, De Felice E, Locascio A, Ristoratore F, Spagnuolo A, Zanetti Z, Branno B, Sordino P. (2015). Mutation studies in ascidians: a review. **Genesis**, 53:160-169



21. Esposito R, Racioppi C, Pezzotti MR, Branno M, Locascio A\*, Ristoratore F\*, Spagnuolo S\* (2015) The ascidian pigmented sensory organs: structures and developmental programs. *Genesis*. 53: 15-33
22. Stolfi A, Lowe KE, Racioppi C, Ristoratore F, Brown CT, Swalla JB, Christiaen L (2014) Divergent mechanisms regulate conserved cardiopharyngeal development and gene expression in distantly related ascidians. *eLife* 3:e03728.
23. Racioppi C, Kamal AK, Razy-Krajka F, Gambardella G, Zanetti L, di Bernardo D, Sanges R, Christiaen AL, Ristoratore F\*. (2014) Fibroblast growth factor signalling controls nervous system patterning and pigment cell formation in *Ciona intestinalis*. **Nature Communications**, 5:4830
24. Russo MT, Racioppi C, Zanetti L, Ristoratore F\*. (2014) Expression of a single prominin homolog in the embryo of the model chordate *Ciona intestinalis*. **Gene Expr Patterns**: 38-45.
25. Sorrenti G, Bagnoli A, Miraglia M, Crocetta F, Vitiello V, Ristoratore F, Cirino P, Sansone G, Sordino P (2014) Investigating sperm cryopreservation in a model tunicate, *Ciona intestinalis* sp. A. **Cryobiology**, 68: 43-49
26. Esposito R, D'Aniello S, Squarzoni P, Pezzotti M R, Ristoratore F, Spagnuolo A. (2012). New Insights into the Evolution of Metazoan Tyrosinase Gene Family. **Plos one** 7, 4: e35731
27. Squarzoni P, Parveen F, Zanetti L, Ristoratore F\*, Spagnuolo A. (2011). FGF/MAPK/Ets signaling renders pigment cell precursors competent to respond to Wnt signal by directly controlling Ci-Tcf transcription. **Development**. 138, 1421-1432
28. Locascio A; Ristoratore F; Spagnuolo A; Zanetti L, Branno M.(2009) Genetic perspectives on the ascidian central nervous system **ISJ-Invertebrate Survival Journal** 6, S35-S45
29. Sordino P, Andreakis N, Brown E, Leccia N, Squarzoni P, Tarallo R, Alfano C, Caputi L, D'Ambrosio P, Daniele P, D'Aniello E, D'Aniello S, Maiella S, Miraglia V, Russo M, Sorrenti G, Branno M, Cariello L, Cirino P, Locascio A, Spagnuolo A, Zanetti L and Ristoratore F.\* (2008) Natural Variation of Model Mutant Phenotypes in *Ciona intestinalis*. **Plos one** 4;3(6):e2344
30. Zanetti L, Ristoratore F, Francone M, Piscopo S, Brown ER (2007). Primary cultures of nervous system cells from the larva of the ascidian *Ciona intestinalis*. **J Neurosci Methods**. 165, 191-197.
31. Zanetti L, Ristoratore F, Bertoni A, Cariello L (2004). Characterization of sea urchin transglutaminase, a protein regulated by Guanine/Adenine nucleotides **J. Biol. Chem.**, 279, 49289-49297.
32. Spagnuolo A\* Ristoratore F\*, Di Gregorio A , Aniello F, Branno M, Di Lauro R. (2003) Unusual number and genomic organization of Hox genes in the tunicate *Ciona intestinalis*. **Gene**. 309, 71-9.
33. Thermes V\*, Grabher C\*, Ristoratore F\*, Bourrat F, Choulika A, Wittbrodt J, Joly, JS (2002). I-SceI meganuclease mediates highly efficient transgenesis in fish. **Mech. Dev**. 118, 91-98.
34. Ristoratore F, Carl M, Deschet K, Richard-Parpaillon L, Boujard D, Wittbrodt J, Chourrout D, Bourrat F, Joly JS.(1999). The midbrain-hindbrain boundary genetic cascade is activated ectopically in the forebrain in response to the widespread expression of one of its component, the medaka gene *OI-eng2*. **Development** 126, 3769-3779.
35. Ristoratore F, Spagnuolo A, Aniello F, Branno M, Fabbrini F, Di Lauro R. (1999) Expression and functional analysis of Citif1, an ascidian NK-2 class gene, suggests its role in fate restriction and development of endoderm. **Development** 126, 5149-5159.
36. Deschet K, Bourrat F, Ristoratore F, Chourrout D, Joly JS (1999) Expression of the medaka (*Oryzias latipes*) *OI-Rx3* paired-like gene in two diencephalic derivatives, the eye and the hypothalamus. **Mechanisms of development** 83, 179-182

37. Di Gregorio A, Villani MG, Locascio A, Ristoratore F, Aniello F, Branno M. (1998) Developmental regulation and tissue-specific localization of calmodulin mRNA in the protochordate *Ciona intestinalis*. **Dev Growth Differ** 40:387-394.
38. Gionti M, Ristoratore F, Di Gregorio A, Branno M, Aniello F, Di Lauro R. (1998). Cihox5, a new *Ciona intestinalis* Hox-related gene, is involved in regionalization of the spinal chord. **Dev. Genes and Evol.** 207, 515-523.
39. Cariello L, Ristoratore F, Zanetti L. (1997) A new transglutaminase from the ascidian *Ciona Intestinalis*. **FEBS letters** 408, 171-176.
40. Di Gregorio A, Spagnuolo A, Ristoratore F, Pischetola M, Aniello F, Branno M, Di Lauro R. (1995) Cloning of ascidian homeobox genes provides evidence for a primordial chordate cluster. **Gene** 156, 253-257.
41. Ristoratore F, Cermola M, Nola N, Bazzicalupo P, Favre R (1994) Ultrastructural immunolocalization of CUT-1 and CUT-2 antigenic sites in the cuticles of the nematode *Caenorhabditis elegans*. **Journal of submicroscopic cytology and pathology** 26, 437-443
42. De Riso L, Ristoratore F, Sebastiano M, Bazzicalupo P. (1994)- Amphid defective mutant of *Caenorhabditis elegans*. **Genetica** 94,195-202.
43. Lewis E, Sebastiano M, Nola M, Zei F, Lassandro F, Ristoratore F,Cermola M, Favre R, Bazzicalupo P (1994) Cuticlin genes of nematodes. **Parasite** 1, S57-S58.
44. Bazzicalupo P; Hilliard M; Lewis E; Deriso L; Sebastiano M; Ristoratore F (1994) neurons and genes involved in chemical-sensitivity in nematodes. **Parasite** 1, 58-60

#### **Book chapter**

Bazzicalupo P., Riso L.D., Maimone F., Ristoratore F., Sebastiano M. (1994) Chemoreception in Nematodes. In: Lamberti F., De Giorgi C., Bird D.M. (eds) *Advances in Molecular Plant Nematology*. NATO ASI Series (Series A: Life Sciences), vol 268. Springer, Boston, MA. Publisher Name Springer, Boston, MA Print ISBN 978-1-4757-9082-5