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## Rosalia Battaglia

POSTDOC RESEARCHER | BIOLOGY AND GENETICS SECTION | DEPARTMENT OF BIOMEDICAL AND BIOTECHNOLOGICAL SCIENCES | UNIVERSITY OF CATANIA, ITALY



### CONTACT

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Dept. of Biomedical and  
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### RESEARCH INTERESTS

Molecular aspects of non-coding RNAs (ncRNAs) biology:  
1) ncRNAs' function in the control of gene expression;  
2) ncRNAs' role in physiology and disease development;  
3) role of molecular signaling in the extracellular milieu mediated by extracellular vesicles.

### EDUCATION

#### 2016 • PHD IN BIOLOGY, GENETICS AND BIOINFORMATICS

Department of Biomedical and Biotechnological Sciences, University of Catania, Italy.

#### 2012 • MASTER OF SCIENCE - Summa cum Laude

Experimental and Applied Biology, University of Pavia, Italy.

#### 2012 • STUDENT WORK ERASMUS PLACEMENT PROJECT

Translational Cardiomyology Laboratory, Inter-Department of Stem Cell Research, Catholic University of Leuven, Belgium.

#### 2009 • BACHELOR OF SCIENCE – Summa cum laude

Biological Sciences, University of Palermo, Italy.

### ACADEMIC AWARDS

#### 2022 • TOP DOWNLOADED PAPERS 2019 - INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES

"Extracellular Vesicles in Human Oogenesis and Implantation"

#### 2019 • STUDY AWARD "RECENT RESEARCH DEVELOPMENTS IN THE FIELD OF BIOMOLECULAR SCIENCES"

Accademia Gioenia, University of Catania, Italy.

### ACADEMIC APPOINTMENTS

2020-23 • PROFESSOR ON CONTRACT OF BIOLOGY AND GENETICS • First level degree course in Nursing, University of Catania.

2020-22 • RESEARCH FELLOW (POSTDOCTORAL) • DEPARTMENT OF BIOMEDICAL AND BIOTECHNOLOGICAL SCIENCES • UNIVERSITY OF CATANIA, ITALY

Project on "Epigenetic modifications in cumulus cells according to woman age and stimulation protocols"

**2019 • RESEARCH FELLOW (POSTDOCTORAL) • DEPARTMENT OF BIOMEDICAL AND BIOTECHNOLOGICAL SCIENCES • UNIVERSITY OF CATANIA, ITALY**

Project on “microRNAs in blastocoel fluid: Multiple comparative analysis to identify molecular markers of embryo quality”. GRANT FOR FERTILITY INNOVATION 2018, supported by MERCK Group.

**FROM 2019 • TEACHER OF II LEVEL MASTER “BIOLOGY AND BIOTECHNOLOGY OF REPRODUCTION” • UNIVERSITY OF CATANIA, ITALY**

Department of Biological, Geological and Environmental Sciences.

**2019•TUTOR OF APPLIED BIOLOGY • UNIVERSITY OF CATANIA, ITALY**

First-level degree course in Exercise Science, Department of Biomedical and Biotechnological Sciences.

**2017-19 • EXPERT ON THE SUBJECT “BIOLOGY, GENOMICS, HUMAN AND MEDICAL GENETICS” • UNIVERSITY OF CATANIA**

Second-level degree course in Medical Biotechnology, Department of Biomedical and Biotechnological Sciences.

**2018•TUTOR OF BIOLOGY, GENOMICS, HUMAN AND MEDICAL GENETICS • UNIVERSITY OF CATANIA, ITALY**

Second-level degree course in Medical Biotechnology, Department of Biomedical and Biotechnological Sciences.

**2018•VISITING RESEARCHER UNIVERSITY OF CATANIA, ITALY**

Department of Biomedical and Biotechnological Sciences.

**2017 • RESEARCH FELLOW (POSTDOCTORAL) • DEPARTMENT OF BIOMEDICAL AND BIOTECHNOLOGICAL SCIENCES • UNIVERSITY OF CATANIA**

Project on “microRNAs in blastocoel fluid: search of molecular markers of embryo quality”, supported by MERCK Group.

**2017•VISITING RESEARCHER UNIVERSITY OF CATANIA, ITALY**

Department of Biomedical and Biotechnological Sciences

## **OTHER ACTIVITIES**

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**PARTICIPATION IN THE ACTIVITIES OF RESEARCH GROUPS CHARACTERIZED BY COLLABORATIONS AT NATIONAL OR INTERNATIONAL LEVEL**

2020-22 - PHOTOMIRNA Project –Phototeranostic and Microvesicle Recognition by Nanostructures under electromagnetic Activation. University of Catania

2018-22 - "MicroRNAs in blastocoel fluid: Multiple comparative analysis to identify molecular markers of embryo quality" – PJ GRANT FOR FERTILITY INNOVATION supported by MERCK. University of Catania

2016-2018 - FIR. University of Catania

2010-2012 – PRIN. University of Pavia

**MEMBER OF SOCIETIES**

EVITA (Extracellular Vesicles Italian Society), AIBG (Associazione Italiana di Biologia e Genetica Generale e Molecolare), ESHRE (European Society of Human Reproduction and Embryology), SIERR (Società Italiana di Embriologia

Riproduzione e Ricerca), SIBBM (The Italian Society of Biophysics and Molecular Biology).

**EDITORIAL BOARD MEMBER**

“Experimental Pharmacology and Drug Discovery”

“Biomedical Technology and Medical Devices Journal ”

**REFEREE FOR INTERNATIONAL JOURNALS**

Molecular Human Reproduction, Reproduction, Genes, Bioscience Reports, Biomedicine & Pharmacotherapy, International Journal of Molecular Science, Frontiers.

## PUBLICATIONS

1. Merulla AE, Stella M, Barbagallo C, Battaglia R, Caponnetto A, Broggi G, Altieri R, Certo F, Caltabiano R, Ragusa M, Barbagallo GMV, Di Pietro C, Purrello M, Barbagallo D. circSMARCA5 Is an Upstream Regulator of the Expression of miR-126-3p, miR-515-5p, and Their mRNA Targets, Insulin-like Growth Factor Binding Protein 2 (IGFBP2) and NRAS Proto-Oncogene, GTPase (NRAS) in Glioblastoma. *Int J Mol Sci.* 2022 Nov 8;23(22):13676. doi: 10.3390/ijms232213676. PMID: 36430152.
2. Battaglia R, Caponnetto A, Caringella AM, Cortone A, Ferrara C, Smirni S, Iannitti R, Purrello M, D'Amato G, Fioretti B, Di Pietro C. Resveratrol Treatment Induces Mito-miRNome Modification in Follicular Fluid from Aged Women with a Poor Prognosis for In Vitro Fertilization Cycles. *Antioxidants (Basel).* 2022 May 21;11(5):1019. doi: 10.3390/antiox11051019. PMID: 35624883; PMCID: PMC9137561.
3. Caponnetto A, Battaglia R, Ferrara C, Vento ME, Borzi P, Paradiso M, Scollo P, Purrello M, Longobardi S, D'Hooghe T, Valerio D, Di Pietro C; Italian Society of Embryology, Reproduction, Research (SIERR). Down-regulation of long non-coding RNAs in reproductive aging and analysis of the lncRNA-miRNA-mRNA networks in human cumulus cells. *J Assist Reprod Genet.* 2022 Apr;39(4):919-931. doi: 10.1007/s10815-022-02446-8. Epub 2022 Mar 5. PMID: 35247118; PMCID: PMC9050988.
4. Barbagallo D, Palermo CI, Barbagallo C, Battaglia R, Caponnetto A, Spina V, Ragusa M, Di Pietro C, Scalia G, Purrello M. Competing endogenous RNA network mediated by circ\_3205 in SARS-CoV-2 infected cells. *Cell Mol Life Sci.* 2022 Jan 17;79(2):75. doi: 10.1007/s00018-021-04119-8. PMID: 35039944; PMCID: PMC8763136.
5. Battaglia R, Alonzo R, Pennisi C, Caponnetto A, Ferrara C, Stella M, Barbagallo C, Barbagallo D, Ragusa M, Purrello M, Di Pietro C. MicroRNA-Mediated Regulation of the Virus Cycle and Pathogenesis in the SARS-CoV-2 Disease. *Int J Mol Sci.* 2021 Dec 7;22(24):13192. doi: 10.3390/ijms222413192. PMID: 34947989; PMCID: PMC8715670.
6. Caponnetto A, Battaglia R\*, Ragusa M, Barbagallo D, Lunelio F, Borzi P, Scollo P, Purrello M, Vento ME, Di Pietro C. Molecular profiling of follicular fluid miRNAs in young women affected by Hodgkin Lymphoma. *Reprod Biomed Online.* 2021 Dec;43(6):1045-1056. doi: 10.1016/j.rbmo.2021.08.007. Epub 2021 Aug 15. PMID: 34627683 . \*Corresponding author.
7. Stella M, Falzone L, Caponnetto A, Gattuso G, Barbagallo C, Battaglia R, Mirabella F, Broggi G, Altieri R, Certo F, Caltabiano R, Barbagallo GMV, Musumeci P, Ragusa M, Pietro CD, Libra M, Purrello M, Barbagallo D. Serum Extracellular Vesicle-Derived circHIPK3 and circSMARCA5 Are Two Novel Diagnostic Biomarkers for Glioblastoma Multiforme. *Pharmaceuticals (Basel).* 2021 Jun 27;14(7):618. doi: 10.3390/ph14070618. PMID: 34198978
8. Barbagallo D, Caponnetto A, Barbagallo C, Battaglia R, Mirabella F, Brex D, Stella M, Broggi G, Altieri R, Certo F, Caltabiano R, Barbagallo GMV, Anfuso CD, Lupo G, Ragusa M, Di Pietro C, Hansen TB, Purrello M. The GAUGAA Motif Is Responsible for the Binding between circSMARCA5 and SRSF1 and Related Downstream Effects on Glioblastoma Multiforme Cell Migration and Angiogenic Potential. *Int J Mol Sci.* 2021 Feb 7;22(4):1678. doi: 10.3390/ijms22041678. PMID: 33562358; PMCID: PMC7915938.
9. Brex D, Barbagallo C, Mirabella F, Caponnetto A, Battaglia R, Barbagallo D, Caltabiano R, Broggi G, Memeo L, Di Pietro C, Purrello M, Ragusa M. LINC00483 Has a Potential Tumor-Suppressor Role in Colorectal Cancer Through Multiple Molecular Axes. *Front Oncol.* 2021 Jan 20;10:614455. doi: 10.3389/fonc.2020.614455. PMID: 33552987; PMCID: PMC7855711
10. Leonardi AA, Battaglia R, Morganti D, Lo Faro MJ, Fazio B, De Pascali C, Francioso L, Palazzo G, Mallardi A, Purrello M, Priolo F, Musumeci P, Di Pietro C, Irrera A. A Novel Silicon Platform for Selective Isolation, Quantification, and Molecular Analysis of Small Extracellular Vesicles. *Int J Nanomedicine.* 2021 Sep 28;16:5153-5165. doi: 10.2147/IJN.S310896. PMID: 34611399; PMCID: PMC8487288.
11. Battaglia R, Musumeci P, Ragusa M,... and Di Pietro C. Ovarian aging increases small extracellular vesicle CD81+ release in human follicular fluid and influences miRNA profiles. *Aging (Albany NY).* 2020;12(12):12324-12341. doi:10.18632/aging.103441.

12. Ragusa M, Barbagallo D, Chioccarelli T, Manfrevola F, Cobellis G, Di Pietro C, Brex D, Battaglia R, Fasano S, Ferraro B, Sellitto C, Ambrosino C, Roberto L, Purrello M, Pierantoni R, Chianese R. CircNAPEPLD is expressed in human and murine spermatozoa and physically interacts with oocyte miRNAs. *RNA Biol.* 2019 May 28. doi: 10.1080/15476286.2019.1624469. PubMed PMID:31135264.
13. Andronico F, Battaglia R\*, Ragusa M, Barbagallo D, Purrello M, Di Pietro C\*. Extracellular Vesicles in Human Oogenesis and Implantation. *Int J Mol Sci.* 2019 May 1;20(9). pii: E2162. doi: 10.3390/ijms20092162. Review. PubMed PMID:31052401. \*Corresponding author.
14. Battaglia R, Palini S, Vento ME, La Ferlita A, Lo Faro MJ, Caroppo E, Borzi P, Falzone L, Barbagallo D, Ragusa M, Scalia M, D'Amato G, Scollo P, Musumeci P, Purrello M, Gravotta E, Di Pietro C. Identification of extracellular vesicles and characterization of miRNA expression profiles in human blastocoel fluid. *Sci Rep.* 2019 Jan 14;9(1):84. doi: 10.1038/s41598-018-36452-7. PubMed PMID: 30643155; PMCID: PMC6331601.
15. La Ferlita A, Battaglia R, Andronico F, Caruso S, Cianci A, Purrello M, Di Pietro C. Non-Coding RNAs in Endometrial Physiopathology. *Int J Mol Sci.* 2018 Jul 20;19(7). pii: E2120. doi: 10.3390/ijms19072120. Review. PubMed PMID: 30037059; PubMed Central PMCID: PMC6073439.
16. Di Pietro C, Caruso S, Battaglia R, Iraci Sareri M, La Ferlita A, Strino F, Bonaventura G, Di Mauro M, Barcellona ML, Perciavalle V, Purrello M, Cianci A. MiR-27a-3p and miR-124-3p, upregulated in endometrium and serum from women affected by Chronic Endometritis, are new potential molecular markers of endometrial receptivity. *Am J Reprod Immunol.* 2018 Apr 16:e12858. doi: 10.1111/aji.12858
17. Ragusa M, Barbagallo C, Brex D, Caponnetto A, Cirnigliaro M, Battaglia R, Barbagallo D, Di Pietro C, Purrello M. Molecular Crosstalking among Noncoding RNAs: A New Network Layer of Genome Regulation in Cancer. *Int J Genomics.* 2017; 2017:4723193. doi: 10.1155/2017/4723193. Epub 2017 Sep 24. Review. PMID: 29147648.
18. Ragusa M, Barbagallo C, Cirnigliaro M, Battaglia R, Brex D, Caponnetto A, Barbagallo D, Di Pietro C, Purrello M. Asymmetric RNA Distribution among Cells and Their Secreted Exosomes: Biomedical Meaning and Considerations on Diagnostic Applications. *Front Mol Biosci.* 2017 Oct 4;4:66. doi: 10.3389/fmolb.2017.00066.eCollection 2017. Review. PMID: 29046875.
19. Battaglia R\*, Vento ME, Borzi P, Ragusa M, Barbagallo D, Arena D, Purrello M, Di Pietro C. Non-coding RNAs in the Ovarian Follicle. *Front Genet.* 2017 May 12;8:57. doi: 10.3389/fgene.2017.00057. eCollection 2017. PMID: 28553318. \*Corresponding author.
20. Battaglia R, Vento ME, Ragusa M, Barbagallo D, La Ferlita A, Di Emidio G, Borzi P, Artini PG, Scollo P, Tatone C, Purrello M, Di Pietro C. MicroRNAs Are Stored in Human MII Oocyte and Their Expression Profile Changes in Reproductive Aging. *Biol Reprod.* 2016 Dec;95(6):131. doi: 10.1095/biolreprod.116.142711. Epub 2016 Nov 9. PMID: 28007692.
21. Battaglia R, Di Pietro C. Long non-coding RNAs: new players in mammalian female gametogenesis. *CCE Current Trends in Clinical Embriology. CIC Edizioni Internazionali* 2016 May-June; 3(3): 104–109. doi: 10.11138/cce/2016.3.3.104.
22. Barbagallo D, Condorelli AG, Ragusa M, Salito L, Sammito M, Banelli B, Caltabiano R, Barbagallo GM, Zappalà A, Battaglia R, Cirnigliaro M, Lanzafame S, Vasquez E, Parenti R, Cicirata F, Pietro CD, Romani M, Purrello M. Dysregulated miR-671-5p / CDR1-AS / CDR1 / VSNL1 axis is involved in glioblastoma multiforme. *Oncotarget.* 2016 Jan 26;7(4):4746-59. doi: 10.18632/oncotarget.6621
23. Di Pietro C, Battaglia R, Guglielmino MR, Casella E, Caruso S, Cianci A. “Could chronic endometritis studies help us find additional molecular markers of endometrium receptivity?”. *CCE Current Trends in Clinical Embriology. CIC Edizioni Internazionali* 2015 January-February; 2(1): 31–34. ISSN: 2385-2836
24. Ragusa M, Barbagallo C, Statello L, Condorelli AG, Battaglia R, Tamburello L, Barbagallo D, Di Pietro C, Purrello M. Non-coding landscapes of colorectal cancer. *World J Gastroenterol* 2015 Nov 7;21(41):11709-39.
25. Santonocito M, Vento M, Guglielmino MR, Battaglia R, Wahlgren J, Ragusa M, Barbagallo D, Borzi P, Rizzari S, Maugeri M, Scollo P, Tatone C, Valadi H, Purrello M, Di Pietro C. 2014. Molecular characterization of exosomes and their microRNA cargo in human follicular fluid: bioinformatic analysis reveals that exosomal microRNAs control pathways involved in follicular maturation. *Fertil Steril.* 2014 Dec;102(6):1751-61.e1. doi: 10.1016/j.fertnstert.2014.08.005.
26. Baena RR, Arciola CR, Selan L, Battaglia R, Imbriani M, Rizzo S, Visai L. 2012. Evaluation of bacterial adhesion on machined titanium, osseotite® and nanotite® discs. *Int J Artif Organs.* 2012 Oct;35(10):754-61. doi: 10.5301/ijao.5000143.
27. Ceccarelli G, Bloise N, Vercellino M, Battaglia R, Morgante L, De Angelis MG, Imbriani M, Visai L. 2012. In vitro osteogenesis of human stem cells by using a three-dimensional perfusion bioreactor culture system: a review. *Recent Pat Drug Deliv Formul.* 2013 Apr;7(1):29-38. Review.

## ABSTRACTS

1. **Battaglia R** Leonardi AA, Morganti D, Lo Faro MJ, Fazio B, De Pascali C, Francioso L, Palazzo G, Mallardi A, Purrello M, Priolo F, Musumeci P, Di Pietro C, Irrera A. A Novel Silicon Platform for Selective Isolation, Quantification, and Molecular Analysis of Small Extracellular Vesicles. *SIBBM 2022 • Frontiers in Molecular Biology. The RNA World 3.0. Rome, Italy · 20-22 June 2022*
2. Leonardi AA, **Battaglia R**, Morganti D, Lo Faro MJ, Fazio B, Caponnetto A, Ferrara C, De Pascali C, Francioso L, Palazzo G, Mallardi A, Purrello M, Priolo F, Musumeci P, Irrera A, Di Pietro C. A novel cost-effective biosensing platform based

on silicon nanowires for liquid biopsy in ovarian cancer. 2nd Evita Symposium-Renaissance Tuscany Il Ciocco Resort 20-22 Settembre 2021.

3. **Battaglia R.** Isolation and characterization of blastocoel fluid microRNAs from single blastocysts. Multiple comparative analyses to identify molecular markers of embryo quality in human assisted reproductive technologies. VI Retreat Dipartimentale (Biometec), 24 ottobre 2020, Microsoft Teams. **Oral Communication**
4. **Battaglia R,** Musumeci P, Ragusa M, Barbagallo D, Vento ME, Purrello M, Di Pietro C. *Ovarian Aging is Associated with Enhanced Release of Exosomes in Human Follicular Fluid influencing the miRNA profile.* 1st EVIta Symposium 2019, 6-8 November Palermo.
5. **Battaglia R,** Palini Vento ME, La Ferlita A, Lo Faro MJ, Caroppo E, Borzi P, Falzone I, Barbagallo D, Ragusa M, Scalia M, D'Amato G, Scollo P, Musumeci P, Purrello M, Gravotta E, Di Pietro C. *Identification of extracellular vesicles and characterization of miRNA expression profiles in human blastocoel fluid.* 18th World Congress of the Academy of Human Reproduction. 3-6 April 2019, Convention Centre Dublin, Ireland. **Oral Communication**
6. Rossi G, Placidi M, Rea F, **Battaglia R,** Gravina GL, Artini PG, Di Pietro C, D'Alessandro AM, Di Emidio G, Tatone C. *Ovaries from adult mice counteract radiotherapy-induced gonadotoxicity through activation of SIRT1 adaptive response.* 18th World Congress of the Academy of Human Reproduction. 3-6 April 2019, Convention Centre Dublin, Ireland.
7. **Battaglia R,** Vento ME, Ragusa M, Barbagallo D, Arena DP, La Ferlita A, Di Emidio G, Borzi P, Artini PG, Scollo P, Tatone C, Purrello M, Di Pietro C. *Identification of MicroRNAs related to Human MII Oocyte in Reproductive Aging.* 17th World Congress of the Academy of Human Reproduction. 15-18 March 2017, Rome, Italy. **Oral Communication.**
8. Di Pietro C, Caruso S, **Battaglia R,** Iraci M, La Ferlita A, Strino F, Bonaventura G, Di Mauro M, Barcellona ML, Perciavalle V, Cianci A. *MicroRNA expression profiles in endometrium and serum from women affected by chronic endometritis.* New molecular markers of endometrium receptivity. 3rd Biomarker meeting in Personalized Reproductive Medicine. 7-9 April 2016, Valencia, Spain.
9. **Battaglia R,** Vento M, Borzi P, Ragusa M, Barbagallo D, Artini PG, Scollo P, Tatone C, Purrello M, Di Pietro C. *The miRNome landscape changes in human ovarian follicles in relation to aging.* 16th World Congress on Human Reproduction. 18-21 March 2015, Berlin, Germany. **Oral Communication.**
10. **R. Battaglia,** M. Santonocito, M. Vento, M.R. Guglielmino, J. Wahlgren, M. Ragusa, D. Barbagallo, P. Borzi, S. Rizzari, M. Maugeri, P. Scollo, C. Tatone, H. Valadi, M. Purrello, C. Di Pietro. *MicroRNAs upregulated in follicular fluid are carried by exosomes: new actors in the communication between oocyte and somatic follicular cells?* 30th Annual Meeting of the European Society of Human Reproduction and Embryology. 29 June-2 July 2014, Munich, Germany. **Oral communication.**
11. Quattrocchi M, Muijtjens M, Montecchiani C, **Battaglia R,** Verfaillie C, Sampaolesi M. Epigenetic memory and myogenic potential of induced pluripotent stem cells. EAB meeting. 2 May 2012, Leuven, Belgium.

Catania, 29.01.23

