

***Prof. STEFANIA ORRU'***  
**[orru@uniparthenope.it](mailto:orru@uniparthenope.it)**

Degree in Chemistry at the University of Naples "Federico II" with full marks and honors.

PhD in Chemical Sciences at the University of Naples "Federico II".

Since 2005, Associate Professor in 06N2 SSD M-EDF/01 (Methods and teaching of movement sciences) at the Department of Movement Sciences and Wellbeing, University of Naples "Parthenope".

Qualified for the Full Professor role in 06N2 SSD M-EDF/01 (deadline March 2023).

Qualified for the Full Professor role in 05E1 SSD BIO-10 (deadline March 2023).

Member of the "PhD in Molecular Medicine" board, University of Naples "Federico II" (XXV-XXVIII cycle)

Member of the PhD board in "Sport and Movement Sciences", University of Naples "Parthenope" (XXX cycle-present).

Member of the Quality Assurance Board at the University of Naples "Parthenope".

Delegate of the Department of Movement Sciences and Wellbeing, University of Naples "Parthenope", for the Quality Assessment Research (VQR).

Member of the Italian Society of Sport and Movement Sciences (SISMeS) and of the Italian Society of Biochemistry and Molecular Biology (SIB).

Member of the SISMeS Board (2018-2020).

Principal Investigator at CEINGE Biotecnologie Avanzate, Naples.

Scientific advisor at IRCCS SDN, Naples.

### ***Research activity***

The research activity is focused on the elucidation of the "structure/function" relationship of proteins, peptides and other biomolecules by means of classical biochemical methodologies coupled with the most advanced structural, differential and functional proteomic approaches. The scientific learning curve goes from the structural determination of protein sequences and post-translational modifications to the conformational analysis of proteins and protein aggregates characterizing neurodegenerative disorders.

Some of the activities carried out at CEINGE Biotecnologie Avanzate investigate the molecular effects of doping agents (di-hydrotestosterone, DHT, and insuline-like growth factor 1, IGF-1) on biological systems and the exercise-mediated serum/muscle molecular biomarkers associated with healthy longevity. Another main topic is related to the analysis of biocompatible nanoparticles (i.e., liposomes) for drug delivery; such nanovectors are characterized at chemical/physical level (stability, size, polydispersity index and surface charge analysis), at biochemical level (identification of protein corona), and at biological level (up-take and cytotoxicity analysis).

PI's research activity is expressed in about 60 articles published in peer-reviewed international journals and in some book chapters.

## **Publications**

- 1.** Nitti G, **Orru' S**, Bloch C, Morhy L, Marino G and Pucci P.  
Amino acid sequence and disulphide-bridge pattern of three  $\gamma$ -thionins from *Sorghum bicolor*.  
*Eur. J. Biochem.* (1995) **228**, 250-256.
- 2.** Palmieri G, Di Palo M, Scaloni A, **Orru' S**, Marino G and Pucci P.  
Glutamate-1-semialdehyde aminotransferase from *Sulfolobus solfataricus*.  
*Biochem. J.* (1996) **320**, 541-545.
- 3.** Amoresano A, Siciliano R, **Orru' S**, Napoleoni R, Altarocca V, De Luca E, Sirna A and Pucci P.  
Structural characterisation of human recombinant glyco hormones follitropin, lutropin and choriogonadotropin expressed in chinese hamster ovary cells.  
*Eur. J. Biochem.* (1996) **242**, 608-618.
- 4.** Febbraio F, Barone R, D'Auria S, Rossi M, Nucci R, Piccialli G, De Napoli L, **Orru' S** and Pucci P.  
Identification of the catalytic amino acid in *Escherichia coli* expressed  $\beta$ -glycosidase from *Sulfolobus solfataricus*.  
*Biochemistry* (1997) **36**, 3068-3075.
- 5.** **Orru' S**, Scaloni A, Giannattasio M, Urech K, Pucci P and Schaller G.  
Amino acid sequence, S-S bridge arrangement and distribution in plant tissue of thionins from *Viscum album*.  
*Biol. Chem.* (1997) **378**, 989-996.
- 6.** Scaloni A, Miraglia N, **Orru' S**, Amodeo P, Motta A, Marino G and Pucci P.  
Topology of the Calmodulin-Melittin complex.  
*J. Mol. Biol.* (1998) **277**, 945-958.
- 7.** Randazzo A, Dal Piaz F, **Orru' S**, Debitus C, Roussakis C, Pucci P and Gomez-Paloma L.  
Axinellins A and B: New proline-containing antiproliferative cyclopeptides from the Vanuatu Sponge *Axinella carteri*.  
*Eur. J. Org. Chem.* (1998) **11**, 2659-2665.
- 8.** Urbani A, Biasiol G, Brunetti M, Volpari C, Di Marco S, Sollazzo M, **Orru' S**, Dal Piaz F, Casbarra A, Pucci P, Nardi C, Gallinari P, De Francesco R and Steinkuhler C.  
Multiple determinants influence complex formation of the hepatitis C virus NS3 protease domain with its NS4A cofactor peptide.  
*Biochemistry* (1999) **38**, 5206-5215.
- 9.** Maras B, Valiante S, **Orru' S**, Simmaco M, Barra D and Churchich JE.  
Structure of pyridoxal kinase from sheep brain and role of the tryptophanyl residues.  
*J. Prot. Chem.* (1999) **18**, 259-268.

- 10. Orru' S**, Dal Piaz F, Casbarra A, Biasiol G, De Francesco R, Steinkuhler C and Pucci P.  
Conformational changes in the NS3 protease from hepatitis C virus strain Bk monitored by limited proteolysis and mass spectrometry.  
*Protein Sci.* (1999) **8**, 1445-1454.
- 11.** Bianchi E, **Orru' S**, Dal Piaz F, Casbarra A, Biasiol G, Koch U, Pucci and Pessi A.  
Conformational changes in human hepatitis C virus NS3 protease upon binding of product-based inhibitors.  
*Biochemistry* (1999) **38**, 13844-13852.
- 12. Orru' S**, Amoresano A, Siciliano R, Napoleoni R, Finocchiaro O, Datola A, De Luca E, Sirna A and Pucci P.  
Structural analysis of modified forms of recombinant IFN- $\beta$  produced under stress-simulating conditions.  
*Biol. Chem.* (2000) **381**, 7-17.
- 13.** Albano F, Thompson MR, **Orru' S**, Scaloni A, Musetta A, Pucci P and Guarino A.  
Structural and functional features of modified heat-stable toxins produced by enteropathogenic *Klebsiella* cells.  
*Pediatr. Res.* (2000) **48**, 685-690.
- 14. Orru' S**, Vitagliano L, Esposito L, Mazzarella L, Marino G and Ruoppolo M.  
Effect of deamidation on folding of Ribonuclease A.  
*Protein Sci* (2000) **9**, 2577-2582.
- 15.** Domingo GJ, **Orru' S** and Perham RN.  
Multiple display of peptides and proteins on a macromolecular scaffold derived from a multienzyme complex.  
*J. Mol. Biol.* (2001) **305**, 259-267.
- 16.** Esposito C, Mariniello L, Cozzolino A, Amoresano A, **Orru' S** and Porta R.  
Rat coagulating gland secretion contains a kinesin heavy chain-like protein acting as type IV transglutaminase substrate.  
*Biochemistry* (2001) **40**, 4966-4971.
- 17.** Amoresano A, **Orru' S**, Siciliano R, De Luca E, Napoleoni R, Sirna A and Pucci P.  
Assignment of the complete disulphide bridges pattern in human recombinant follitropin  $\beta$  chain.  
*Biol. Chem.* (2001) **382**, 961-968.
- 18.** Pallaoro M, Lahm A, Biasiol G, Brunetti M, Nardella C, Orsatti L, Bonelli F, **Orru' S** and Steinkuhler C.  
Characterisation of the hepatitis C virus NS2/3 processing reaction using a purified precursor protein.  
*J Virol.* (2001) **75**, 9939-9946.
- 19. Orru' S**, Ruoppolo M, Francese S, Vitagliano L, Marino G and Esposito C.  
Identification of tissue transglutaminase-reactive lysine residues in glyceraldehyde 3-phosphate dehydrogenase.  
*Protein Sci.* (2002) **11**, 137-146.

- 20.** Casbarra A, Dal Piaz F, Ingallinella P, **Orru' S**, Pucci P, Pessi A and Bianchi E.  
The effect of prime site occupancy on the HCV NS3 protease structure.  
*Protein Sci.* (2002) **11**, 2102-2112.
- 21.** Orsatti L, Pallaoro M, Steinkuhler C, **Orru' S** and Bonelli F.  
Reactivity of NS2/3<sub>(907-1206)</sub>ASK<sub>4</sub> protein with  $\beta$ -mercaptoethanol studied by electrospray ion trap mass spectrometry.  
*Rapid Comm. Mass Spect.* (2002) **16**, 1919-1927.
- 22.** Ruoppolo M, **Orru' S**, Francese S, Caputo I and Esposito C.  
Structural characterisation of transglutaminase-catalysed cross-linking between glyceraldehyde 3-phosphate dehydrogenase and polyglutamine repeats.  
*Protein Sci.* (2003) **12**, 170-179.
- 23.** Ruoppolo M, **Orru' S**, Talamo F, Ljung J, Pirneskoski A, Kivirikko KI, Marino G and Koivunen P.  
Mutations in domain a' of a protein disulfide isomerase affect the folding pathway of bovine pancreatic ribonuclease A.  
*Protein Sci.* (2003) **12**, 939-952.
- 24.** Ruoppolo M, **Orru' S**, D'Amato A, Francese S, Rovero P and Esposito C.  
Analysis of transglutaminase protein substrates by functional proteomics.  
*Protein Sci.* (2003) **12**, 1290-1297.
- 25.** **Orru' S**, Caputo I, D'Amato A, Ruoppolo M, Esposito C.  
Proteomics identification of Acyl-acceptor and Acyl-donor substrates for transglutaminase in a human intestinal epithelial cell line: Implications for coeliac disease.  
*J Biol Chem.* (2003) **278**, 31766-31773.
- 26.** Castro MS, Gerhardt IR, **Orru' S**, Pucci P, Bloch C Jr.  
Purification and characterization of a small (7.3 kDa) putative lipid transfer protein from maize seeds.  
*J Chromatogr B Analyt Technol Biomed Life Sci.* (2003) **794**, 109-14.
- 27.** Vasca E, Ferri D, Manfredi C, Torello L, Fontanella C, Caruso T, **Orru' S**.  
Complex formation equilibria in the binary Zn<sup>2+</sup>-oxalate and In<sup>3+</sup>-oxalate systems.  
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- 28.** Silvennoinen L, Myllyharju J, Ruoppolo M, **Orru' S**, Caterino M, , Kivirikko KI, Marino G and Koivunen P.  
Identification and characterization of structural domains of human ERp57. Association with calreticulin requires several domains.  
*J Biol Chem.* (2004) **279**, 13607-13615.
- 29.** Monti M, **Orru' S**, Pagnozzi D and Pucci P.  
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- 30.** Monti M, **Orru' S**, Pagnozzi D and Pucci P.  
Functional Proteomics  
*Clin. Chim. Acta* (2005) **357**, 140-150.

- 31.** de Laurentiis A, Caterino M, **Orrù S**, Ruoppolo M, Tuccillo F, Masullo M, Quinto I, Scala G, Pucci P, Palmieri C, Tassone P, Salvatore F, Venuta S.  
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- 32.** Di Gaetano S, Guglielmi F, Arciello A, Mangione P, Monti M, Pagnozzi D, Raimondi S, Giorgetti S, **Orrù S**, Canale C, Pucci P, Dobson CM, Bellotti V, Piccoli R.  
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- 33.** Caterino M, Ruoppolo M, **Orrù S**, Savoia M, Perrotta S, Del Vecchio L, Salvatore F, Stewart GW, Iolascon A.  
Characterization of red cell membrane proteins as a function of red cell density: annexin VII in different forms of hereditary spherocytosis.  
*FEBS Lett.* (2006) **580**, 6527-6532.
- 34.** **Orrù S**, Aspesi A, Armiraglio M, Caterino M, Loreni F, Ruoppolo M, Santoro C, Dianzani I.  
Analysis of the ribosomal protein S19 interactome.  
*Mol Cell Proteomics.* (2007) **6**, 382-393.
- 35.** Caterino M, Ruoppolo M, Fulcoli G, Huynh T, **Orrù S**, Baldini A, Salvatore F.  
Transcription factor TBX1 overexpression induces downregulation of proteins involved in retinoic acid metabolism: A comparative proteomic analysis  
*J Proteome Res* (2009) **8**: 1515-1528.
- 36.** Imperlini E, Mancini A, Spaziani S, Martone D, Alfieri A, Gemei M, Del Vecchio L, Buono P, **Orrù S**.  
Androgen receptor signaling induced by supraphysiological doses of dihydrotestosterone in human peripheral blood lymphocytes.  
*Proteomics* (2010) **10**, 3165-3175.
- 37.** Corbo C, **Orrù S**, Gemei M, Di Noto R, Mirabelli P, Imperlini E, Ruoppolo M, Del Vecchio L, Salvatore F.  
Protein cross-talk in CD133+ colon cancer cells indicates activation of the Wnt pathway and up-regulation of SRp20 that is potentially involved in tumorigenicity.  
*Proteomics* (2012) **12**: 2045-2059.
- 38.** Corbo C, **Orrù S**, Salvatore F.  
SRp20: An overview of its role in human diseases.  
*Biochem Biophys Res Commun* (2013) **436**: 1-5.
- 39.** Imperlini E, Colavita I, Caterino M, Mirabelli P, Pagnozzi D, Del Vecchio L, Di Noto R, Ruoppolo M, **Orrù S**.  
The secretome signature of colon cancer cell lines.  
*J Cell Biochem* (2013) **114**: 2577-2587.
- 40.** Mancini A, Imperlini E, Alfieri A, Spaziani S, Martone D, Parisi A, **Orrù S**, Buono P.  
DHT and IGF-1 in peripheral blood lymphocytes: new markers for the Athlete's Biological Passport  
*J Biol Reg Homeos Ag* (2013) **27**: 757-770.

41. Imperlini E, **Orrù S**, Corbo C, Daniele A, Salvatore F.  
Altered brain protein expression profiles are associated with molecular neurological dysfunction in the PKU mouse model  
*J Neurochem* (2014), **129**: 1002-1012.
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A novel anti-aldolase C antibody specifically interacts with residues 85-102 of the protein  
*mAbs* (2014), **6**: 708-717.
43. Spaziani S, Imperlini E, Mancini A, Caterino M, Buono P, **Orrù S**.  
Insulin-like growth factor 1 receptor signaling induced by supraphysiological doses of IGF-1 in human peripheral blood lymphocytes.  
*Proteomics* (2014) **14**: 1623-1629.
44. Imperlini E, Spaziani S, Mancini A, Caterino M, Buono P, **Orrù S**.  
Synergistic effect of DHT and IGF-1 hyperstimulation in human peripheral blood lymphocytes.  
*Proteomics*. (2015) **15**: 1813-1818.
45. Imperlini E, Mancini A, Alfieri A, Martone D, Caterino M, **Orrù S**, Buono P.  
Molecular effects of supraphysiological doses of doping agents on health.  
*Mol. BioSyst.* (2015) **11**: 1494-1506.
46. Nigro E, Imperlini E, Scudiero O, Monaco ML, Polito R, Mazzarella G, **Orrù S**, Bianco A, Daniele A.  
Differentially expressed and activated proteins associated with non small cell lung cancer tissues.  
*Respir. Res.* (2015) **16**: 74.
47. Lavatelli F, Imperlini E, **Orrù S**, Rognoni P, Sarnataro D, Palladini G, Malpasso G, Soriano ME, Di Fonzo A, Valentini V, Gnechi M, Perlini S, Salvatore F, Merlini G.  
Novel mitochondrial protein interactors of immunoglobulin light chains causing heart amyloidosis.  
*FASEB J* (2015) **29**: 4614-4628.
48. Mancini A, Imperlini E, Nigro E, Montagnese C, Daniele A, **Orrù S**, Buono P.  
Biological and Nutritional Properties of Palm Oil and Palmitic Acid: Effects on Health  
*Molecules* (2015) **20**: 17339-17361.
49. Imperlini E, Santorelli L, **Orrù S**, Scolamiero E, Ruoppolo M, Caterino M.  
Mass Spectrometry-Based Metabolomic and Proteomic Strategies in Organic Acidemias.  
*Biomed Res Int.* (2016) **2016**: 9210408.
50. Mancini A, Vitucci D, Labruna G, Imperlini E, Randers MB, Schmidt JF, Hagman M, Andersen TR, Russo R, **Orrù S**, Krstrup P, Salvatore F, Buono P.  
Effect of lifelong football training on the expression of muscle molecular markers involved in healthy longevity.  
*Eur J Appl Physiol.* (2017) **117**: 721-730.
51. Martone D, Giacobbe M, Capobianco A, Imperlini E, Mancini A, Capasso M, Buono P, **Orrù S**.  
Exercise intensity and technical demands of small-sided soccer games for under-12 and under-14 players: effect of area per player.  
*Journal of Strength & Conditioning Research* (2017) **31**(6): 1486-1492.

- 52. Orrù S**, Nigro E, Mandola A, Alfieri A, Buono P, Daniele A, Mancini A, Imperlini E.  
A functional interplay between IGF-1 and Adiponectin  
*Int. J. Mol. Sci.* (2017) 18: E2145.
- 53.** Caterino M, Ruoppolo M, Mandola A, Costanzo M, **Orrù S**, Imperlini E.  
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*Mol. BioSyst* (2017) 13: 2466-2476.
- 54.** Imperlini E, Gneccchi M, Rognoni P, Sabidò E, Ciuffreda MC, Palladini G, Espadas G, Mancuso FM, Bozzola M, Malpasso G, Valentini V, Palladini G, **Orrù S**, Ferraro G, Milani P, Perlini S, Salvatore F, Merlini G, Lavatelli F.  
Proteotoxicity in cardiac amyloidosis: amyloidogenic light chains affect the levels of intracellular proteins in human heart cells.  
*Sci. Rep.* (2017) 7: 15661.
- 55.** Foti F, Martone D, **Orrù S**, Montuori S, Imperlini E, Buono P, Petrosini L, Mandolesi L.  
Are young children able to learn exploratory strategies by observation?  
*Psychol Res* (2018), 82: 1212-1223.
- 56.** Vitucci D, Imperlini E, Arcone R, Alfieri A, Canciello A, Russomando L, Martone D, Cola A, Labruna G, **Orrù S**, Tafuri D, Mancini A, Buono P.  
Serum from differently exercised subjects induces myogenic differentiation in LHCN-M2 human myoblast.  
*J Sports Sci* (2018) 36: 1630-1639.
- 57.** Alfieri A, Imperlini E, Nigro E, Vitucci D, **Orrù S**, Daniele A, Buono P, Mancini A.  
Effects of plant oil interesterified triacylglycerols on lipemia and human health.  
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- 58.** Cevenini A, **Orrù S**, Mancini A, Alfieri A, Buono P, Imperlini E.  
Molecular signatures of the Insulin-like Growth Factor 1-mediated epithelial-mesenchymal transition in breast, lung and gastric cancers  
*Int. J. Mol. Sci.* (2018) 19, pii: E2411 (doi: 10.3390/ijms19082411).
- 59. Orrù S**, Imperlini E, Nigro, E, Alfieri A, Cevenini A, Polito R, Daniele A, Buono P, Mancini A.  
Role of functional beverages on sport performance and recovery  
*Nutrients* (2018), 10, pii: E1470 (doi: 10.3390/nu10101470).
- 60.** Mancini A, Vitucci D, Randers MB, Schmidt JF, Hagman M, Andersen TR, Imperlini E, Mandola A, **Orrù S**, Krstrup P, Buono P.  
Lifelong football training: effects on autophagy and healthy longevity promotion  
*Frontiers Physiol* (2019) *accepted*
- 61.** Orlandella FM, Mariniello RM, Iervolino PLC, Imperlini E, Mandola A, Verde A, De Stefano AE, Esposito S, Basolo F, **Orrù S**, Salvatore G.  
miR-650 promotes motility of anaplastic thyroid cancer cells by targeting PPP2CA.  
*Endocrine* (2019) *submitted*

### ***Capitoli di Libri***

**1p.** Pessi A, **Orrù S**, Ingallinella P, Ingenito R, Koch U, Pucci P, Bianchi E.

Structural studies of peptide inhibitors bound to hepatitis C virus protease yield insights into mechanism of action of the enzyme.

In: Fields GB, Tam JP, Barany G. Peptides for the New Millennium. 2000. p. 467-469, NEW YORK:Kluwer Academic, ISBN: 978-0-7923-6445-0.

**2p.** **Orrù S.**

Cap. 3: Comportamento Biomeccanico dei Tessuti Muscolo-Scheletrici.

In: Buono P, Salvatore F. Attività Fisica per la Salute. 2009 pp 47-64. Idelson-Gnocchi (Napoli). ISBN: 978-88-7947-509-9.

**3p.** Buono P, **Orrù S.**

Cap. 21: La biochimica delle attività motorie.

In: Salvatore F, Ruoppolo M. Biochimica Speciale Umana. 2012 pp 675-726. Idelson-Gnocchi (Napoli). ISBN: 978-88-7947-556-3.

**4p.** **Orrù S.**

Cap. 3: Comportamento Biomeccanico dei Tessuti Muscolo-Scheletrici.

In: Buono P. Attività Fisica per la Salute (2nda ed.) 2016. Idelson-Gnocchi (Napoli). ISBN: 978-88-7947-638-6.