PERSONAL INFORMATION

Giuseppe Di Natale

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Sex : Male

Date of birth 26/10/1977

Nationality Italian

Enterprise	University	EPR
☐ Management Level	☐ Full professor	☐ Research Director and 1st level Technologist / First Researcher and 2nd level Technologist
☐ Mid-Management Level	☐ Associate Professor	☒ Level III Researcher and Technologist
☐ Employee / worker level	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

WORK EXPERIENCE

2011-to present **Researcher at CNR, Catania**

- 2017 to present, Institute of Crystallography (IC)-Catania
- 2011-2017, Institute of Biostructures and Bioimaging-Catania
- 2015, teaching activity “Advanced mass spectrometry techniques and their applications in proteomic investigations and the study of metal / peptide interactions” in reference to the training project "From natural compounds to nanostructured systems: applications and products for health"
- 2014 teaching activity "design and potential of polypeptide-based drug-delivery systems" provided for in the training course entitled: Technologist expert in the development of nano-enabling technologies for drugs delivery (OF2) (PON HYPPOCRATES project)

2009-2010
- Employed by Wyeth-Lederle/Pfizer pharmaceutical industries as specialist in HPLC and mass spectrometry techniques

2006-2009
- Collaboration assignment with the University of Catania within the research project "Folding and Aggregation of proteins: Metals and Biomolecules in conformational diseases"
- study tours at the Department of Inorganic and Analytical Chemistry, University of Debrecen (Hungary) in frame of collaboration between the Hungarian Academy of Sciences (MTA) and the Research Group of CNR Institute of Biostructures and Bioimaging of Catania, (Italy)

2002-2003
- Collaboration assignment with the University of Catania within the research project " Use of high-field NMR spectroscopy to study the structure of biological polymers, their function and their interaction with small molecules such as substrates and / or drugs "

EDUCATION AND TRAINING

2006-2009
- Trained research fellowship at CNR
- Bioinorganic chemistry of metal complexes with biologically active peptides.

2008
- Master's degree (level 8 EQF) in “Molecular pharmaceutical and diagnostics”

2006
- Ph.D. in Chemistry (University of Catania)

2002
- Degree in Chemistry (University of Catania)

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s) English

Conferences

- International Symposium on Pathomechanisms of Amyloid diseases, Catania, 25-27 July 2022
  Poster presentation: Limited proteolysis studies of Aβ42 by mass spectrometry: an alternative approach to investigate the interactions between Aβ42 and its aggregation inhibitors
- XXVII Congresso Nazionale della Società Chimica Italiana, online, 14-23 settembre 2021
  Poster presentation: Understanding the interaction between amyloid β peptide (1-42) and its aggregation inhibitors: application of ESI and MALDI mass spectrometry
- Conferenza di Cristallografia, Chimica Strutturale e Biosistemi, Catania, 26-28 febbraio 2020
  Oral presentation: A survey of different approaches using ESI Mass Spectrometry for the characterization of metal binding sites in amyloid peptide fragments.
- International Symposium on Metal Complexes 2019 (ISMEC 2019), Debrecen (Hungary) 11-14 June 2019
  Poster presentation: Copper(II) binding within the N-terminal region of the Tau protein: the use of model peptides for the evaluation of metal ion binding preferences.
- XVI Workshop on PharmacoBioMetallics (BioMet 16), Messina, 28-29 October 2016
  Poster presentation: Copper(II) interaction with N-Terminal domain of β-Amyloid Dimers: new insights into the coordination properties of Aβ oligomers
- Congresso Nazionale della Divisione di Chimica dei Sistemi Biologici, Siracusa, 24-25 Settembre 2015
  Poster presentation: Copper(II) interaction within the N-Terminal domain using a molecular mimic of an Aβ(1-16) dimer: new insights into the coordination properties of oligomeric Aβ
- IX Annual Congress - EuPA - European Proteomics Association, Milano, 23-28 June 2015
  Poster presentation: MALDI-MS method for the measurement of Ubiquitin activation
- XLIII Congresso Nazionale di Chimica Inorganica (Inorg2015), Camerino 9-12 settembre 2015
  Poster presentation: Copper(II) interaction with N-Terminal domain of β-Amyloid Dimers: new insights into the coordination properties of Aβ oligomers
- SCI, Convegno Congiunto delle Sezioni Calabria e Sicilia 2013 Catania, Catania, 2-3 Dicembre 2013
  Poster presentation: Caratterizzazione dei complessi del Cu(II) con il frammento peptidico corrispondente ai residui 60-114 del prione umano
- XIII workshop on pharmacoBioMetallics (Biomet 13) Catania, 25-26 October 2013
  Poster presentation "Interaction of Copper(II) with the PEG-ylated derivative peptide fragment encompassing residues 60-114 of prion protein".
- Scuola nazionale "Metodologie Analitiche e Bioanalitiche in Spettrometria di Massa", Parma, 14-18 Maggio 2012
- TOF-TOF Users' Meeting (Applied Biosystems) Pisa, 19-20 Novembre 2008
- Congresso Regionale SIBioC Sezione Sicilia "Genomica e Proteomica: Realtà e Prospettive nell'Applicazione Diagnostica" Catania, 24-26 Ottobre 2007
- Corso di Proteomica, Fondazione per le Biotecnologie. Ivrea, Bioindustry Park, 12-15 Marzo 2006
- 9th International Symposium on Applied Bioinorganic Chemistry, Napoli, 2-5 Dicembre 2006
- X Scuola Nazionale per Dottorandi Chimica Bioinorganica, Catania, 12-14 Settembre 2005
- Convegno Nazionale della Società Chimica Italiana Sezione Chimica Inorganica, Siena, 16-21 Luglio 2005
- Gordon Research Conferences on Chemistry and Biology of Peptides, Ventura Beach, California, 15-18 February 2004
- Training course "Innovative Combinatorial Approaches and Technologies" (Polo Scientifico dell'Università di Firenze), Firenze, 9-11 Aprile, 2003
- Convegno Regionale della Società Chimica Italiana Sezione Sicilia, Acireale, 2-3 Dicembre 2002

Digital skills

Trained user of most common writing and elaborating computer software. Microsoft Office package, Corel Draw, Origin, Qual browser, MMass. Data bank user.

Other skills

Chemical synthesis of peptides, structural and conformational analyses of peptides by means of ESI-MS, MALDI-MS, CD. Metal complexes with biomolecules, handling of Amyloid peptides, protein/protein interaction.

ADDITIONAL INFORMATION

Relevant Projects

- 2019-2022 PON Progetti di Ricerca Industriale e Sviluppo Sperimentale nelle 12 aree di Specializzazione PNR 2015-2020 Project ARS01_1270 entitled "Innovative Devices for Shaping the Risk of Diabetes.

- 2016-2018 HAS-CNR bilateral research Programme: project “Peptide based nanostructures as theranostic tools for biological systems”.
- 2012-2015 PON02_00607_3421644-OR: project “Studio di piccole molecole citoprotettive con duplice applicabilità nella demenza di Alzheimer e nel trattamento del diabete mediante il trapianto di isole pancreatiche".
- 2012-2015 PON 02_00355_2964193/1: project “Sviluppo di micro e nano-tecnologie e sistemi avanzati per la salute dell’uomo-HIPPOCRATES.“
- 2010-2015 PON 01_01078: project “Identificazione di biomarcatori e sviluppo di metodi diagnostici e terapeutici nel campo dell’oncologia e della biologia vascolare.”
- 2011-2014 FIRB-MERIT project ”Molecular bases in ageing-related degenerative syndromes.”

Publications

33 publications (peer review International Journals, Book chapters)

- Di Natale, G. et al. Aβ and Tau Interact with Metal Ions, Lipid Membranes and Peptide-Based Amyloid Inhibitors: Are These Common Features Relevant in Alzheimer’s Disease? Molecules (Basel, Switzerland) vol. 27 5066 at https://doi.org/10.3390/molecules27165066 (2022).
- Mazzaglia, A. et al. KLVFF oligopeptide-decorated amphiphilic cyclodextrin nanomagnets for selective amyloid beta recognition and fishing. J. Colloid Interface Sci. 613, 814–826 (2022).
- Consoli, G. M. L. et al. Novel Peptide-Calix[4]arene Conjugate Inhibits Aβ Aggregation and Rescues Neurons from Aβ’s Oligomers Cytotoxicity in Vitro. ACS Chem. Neurosci. 12, 1449–1462 (2021).
- Sciacca, M. F. M., Di Natale, G., Milardi, D. & Pappalardo, G. Tau/Aβ chimera peptides: A Thioflavin-T and MALDI-TOF study of Aβ amyloidosis in the presence of Cu(II) or Zn(II) ions and total lipid brain extract (TLBE) vesicles. Chem. Phys. Lipids 237, 105085 (2021).
- Balogh, B. D. et al. Copper (II) binding properties of an octapeptide fragment from the R3 region of tau protein: A combined potentiometric, spectroscopic and mass spectrometric study. J. Inorg. Biochem. 217, 111358 (2021).
- Dell’acqua, S. et al. Interaction between hemin and prion peptides: Binding, oxidative reactivity and aggregation. Int. J. Mol. Sci. 21, 1–17 (2020).
- Magrì, A. et al. Zinc Interactions with a Soluble Mutated Rat Amylin to Mimic Whole Human Amylin: An Experimental and Simulation Approach to Understand Stoichiometry, Speciation and Coordination of the Metal Complexes. Chem. – A Eur. J. 26, 13072–13084 (2020).
- Sciacca, M. F. M., Di Natale, G., Tosto, R., Milardi, D. & Pappalardo, G. Tau/Aβ chimera peptides: Evaluating the dual function of metal coordination and membrane interaction in one sequence. J. Inorg. Biochem. 205, 110996 (2020).
- Lukács, M. et al. Copper(II) Coordination Abilities of the Tau Protein’ s N‐Terminus Peptide Fragments: A Combined Potentiometric, Spectroscopic and Mass Spectrometric Study. Chempluschem 84, 1697‐1708 (2019).
- Di Natale, G. Hybrid Mass Spectrometers. in Mass Spectrometry: An Applied Approach, 2nd Edition (ed. Marek Smoluch (Editor), Giuseppe Grasso (Editor), Piotr Suder (Editor), J. S. (Editor)) 448 (Wiley, 2019).
- Di Natale, G. et al. Potential therapeutics of Alzheimer’s diseases: New insights into the neuroprotective role of trehalose-conjugated beta sheet breaker peptides. Pept. Sci. 110, e24083 (2018).
- Magrì, A., Di Natale, G. & Rizzarelli, E. Copper-assisted interaction between amyloid-β and prion: Ternary metal complexes with Aβ N-terminus and octarepeat. Inorganica Chim. Acta 472, 93–102 (2018).
- Villari, V. et al. A Metalloporphyrin-Peptide Conjugate as an Effective Inhibitor of Amyloid-β Peptide Fibrillation and Cytotoxicity. ChemistrySelect 2, 9122–9129 (2017).
- Di Natale, G., Bellia, F., Sciacca, M. F. M., Campagna, T. & Pappalardo, G. Tau-peptide fragments and their copper(II) complexes: Effects on Amyloid-β aggregation. Inorganica Chim. Acta 472, 82–92 (2018).
- Dell’Acqua, S. et al. Prion Peptides Are Extremely Sensitive to Copper Induced Oxidative Stress. Inorg. Chem. 56, 11317–11325 (2017).
- Tomasello, M. F. et al. New comprehensive studies of a gold(III) Dithiocarbamate complex with proven anticancer properties: Aqueous dissolution with cyclodextrins, pharmacokinetics and upstream inhibition of the ubiquitin-proteasome pathway. Eur. J. Med. Chem. 138, 115–127 (2017).
- Lanza, V., Milardi, D., Di Natale, G. & Pappalardo, G. Repurposing of Copper(II)-chelating Drugs for the Treatment of Neurodegenerative Diseases. Curr. Med. Chem. 25, 525–539 (2018).
- Lanza, V. et al. Ubiquitin Associates with the N-Terminal Domain of Nerve Growth Factor: The Role of Copper(II) Ions. Chem. - A Eur. J. 22, 17767–17775 (2016).
- Di Natale, G. et al. Copper(II) coordination properties of the Aβ(1–16)2 peptidomimetic: experimental evidence of intermolecular macrochelate complex species in the Aβ dimer. New J. Chem. 40, 10274–10284 (2016).
- Di Natale, G., Turi, I., Pappalardo, G., Sóvágó, I. & Rizzarelli, E. Cross-Talk Between the Octarepeat

Domain and the Fifth Binding Site of Prion Protein Driven by the Interaction of Copper(II) with the N-terminus. Chemistry 21, 4071–4084 (2015).

- Osz, K. et al. Copper(II) interaction with prion peptide fragments encompassing histidine residues within and outside the octarepeat domain: speciation, stability constants and binding details. Chemistry 13, 7129–43 (2007).
- Di Natale, G. et al. Affinity, speciation, and molecular features of copper(II) complexes with a prion tetraoctarepeat domain in aqueous solution: insights into old and new results. Chemistry 19, 3751–61 (2013).
- Farkas, E., Csapó, E., Buglyó, P., Damante, C. A. & Natale, G. Di. Metal-binding ability of histidine-containing peptidehydroxamic acids: Imidazole versus hydroxamate coordination. Inorganica Chim. Acta 362, 753–762 (2009).
- Jószai, V. et al. Transition metal complexes of terminally protected peptides containing histidyl residues. J. Inorg. Biochem. 100, 1399–1409 (2006).
- La Mendola, D. et al. Copper(II) complexes with an avian prion N-terminal region and their potential SOD-like activity. J. Inorg. Biochem. 103, 195–204 (2009).
- Turi, I. et al. Nickel(II) complexes of the multihistidine peptide fragments of human prion protein. J. Inorg. Biochem. 104, 885–891 (2010).
- Bonomo, R. P., Di Natale, G., Rizzarelli, E., Tabbì, G. & Vagliasindi, L. I. Copper(II) complexes of prion protein PEG11-tetraoctarepeat fragment: spectroscopic and voltammetric studies. Dalton Trans. 2637–2646 (2009) doi:10.1039/b821727k.
- Di Natale, G. et al. Copper(II) interaction with unstructured prion domain outside the octarepeat region: speciation, stability, and binding details of copper(II) complexes with PrP106-126 peptides. Inorg. Chem. 44, 7214–7225 (2005).
- Di Natale, G., Impellizzeri, G. & Pappalardo, G. Conformational properties of peptide fragments homologous to the 106-114 and 106-126 residues of the human prion protein: a CD and NMR spectroscopic study. Org. Biomol. Chem. 3, 490–497 (2005).
- Di Natale, G. et al. Interaction of copper(II) with the prion peptide fragment HuPrP(76-114) encompassing four histidyl residues within and outside the octarepeat domain. Inorg. Chem. 48, 4239–4250 (2009).
- Di Natale, G. et al. Membrane Interactions and Conformational Preferences of Human and Avian Prion N-Terminal Tandem Repeats: The Role of Copper(II) Ions, pH, and Membrane Mimicking Environments. J. Phys. Chem. B 114, 13830–13838 (2010).
- Jószai, V. et al. Mixed metal copper(II)-nickel(II) and copper(II)-zinc(II) complexes of multihistidine peptide fragments of human prion protein. J. Inorg. Biochem. 112, 17–24 (2012).
- Di Natale, G. Di et al. Copper(II) binding to two novel histidine-containing model hexapeptides: Evidence for a metal ion driven turn conformation. J. Inorg. Biochem. 102, 2012–2019 (2008).

Researcher ID	B-5693-2015
ORCID	0000-0002-1241-3246
Scopus ID	55845079900
citations	WOS 614; Scopus 575; Google scholar 720
h-index	WOS 14; Scopus 13; Google scholar 15;

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016,
“I hereby express my consent to process and use my data provided in this CV".

Giuseppe Di Natale