

# ***CURRICULUM VITAE***

## **NADIA RAFFAELLI**

### **Full Professor of Biochemistry**

**Department of Agricultural, Food and Environmental Sciences, Marche Polytechnic University, Ancona, Italy**

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### **EDUCATION AND TRAINING**

1984  
1/1987-12/1987      Doctoral Degree in “Biological Sciences” at the University of Camerino, Italy  
Post-doctoral fellowship at the Department of Biochemistry and Molecular Biology, University of Florida, Gainesville, USA

1988  
Specialization in “Microbiology” at the University of Camerino, Italy

### **POSITIONS**

11/1989-11/1990      Researcher of Biochemistry at the Department of Molecular and Cellular Biology, Faculty of Sciences, University of Camerino, Italy.

12/1990-3/2001      Qualified Laboratory Technician at the Biochemistry Institute, Faculty of Medicine, University of Ancona, Italy

4/2001-10/2001      Researcher of Biochemistry at the Faculty of Medicine, University of Ancona, Italy

11/2001-10/2006      Associate Professor of Biochemistry, Faculty of Agriculture, Polytechnic University of Marche, Italy

11/2006 - present      Full Professor of Biochemistry, Department of Agricultural, Food and Environmental Sciences, Polytechnic University of Marche, Italy

### **TEACHING ACTIVITY**

2001/2002      “Analisi delle piante officinali e loro derivati”, B.Sc. “in Tecniche Erboristiche”, Faculty of Agriculture, University of Ancona

2001/2002-2003/2004      “Propedeutica Biochimica”, B.Sc. in “Scienze e Tecnologie Agrarie ed Alimentari”, Faculty of Agriculture, University of Ancona

2004/2005-2009/2010      “Biochimica”, B.Sc. in “Scienze degli Alimenti”, Faculty of Agriculture, University of Ancona

2008/2009      “Chimica ed analisi degli alimenti”, M.Sc. in “Scienze degli Alimenti e della Nutrizione”, Faculty of Agriculture, Polytechnic University of Marche

2010/2011-2016/2017      “Biochimica degli Alimenti”, B.Sc. in “Scienze e Tecnologie Alimentari”, Department of Agricultural, Food and Environmental Sciences (D3A), Polytechnic University of Marche

2010/2011-present      “Biochimica 2”, B.Sc. in “Scienze e Tecnologie Alimentari”, D3A, Polytechnic University of Marche

2016/2017- present	“Food Biochemistry”, M.Sc. in “Food and Beverage Innovation and Management”, D3A, Polytechnic University of Marche
2001-2007	Member of the School for the PhD program in “Biomedical Biotechnologies”, Faculty of Medicine, Polytechnic University of Marche
2007 -present	Member of the board of the PhD program in “Agricultural, Food and Environmental Sciences”, Polytechnic University of Marche, Italy

Since 2002/2003 Prof. Raffaelli has been the supervisor of several B.Sc. and M.Sc. students, 11 PhD students, and several postdoctoral fellows.

### **INSTITUTIONAL RESPONSABILITIES**

2015 - 2021	Vice Director of the Department of Agricultural, Food and Environmental Sciences, Polytechnic University of Marche, Italy
2017 – 2021	President of the Ethics Committee, Polytechnic University of Marche, Italy
2017 – 2021	Member of the Discipline Committee, Polytechnic University of Marche, Italy
2019 – present	Rector’s Delegate for Research
2020 – present	Member of the Research Ethics Committee
2020 – present	Member of the Data protection Committee

### **MEMBERSHIPS AND OTHER ACTIVITIES**

1992 - present	Member of the Italian Society of Biochemistry
2015 - 2019	Member of the Scientific Advisory Board of the Institute of Food Sciences, National Research Council of Italy, Avellino, Italy

- Expert nominated by the Italian Ministry of University and Research as member of the Committee for the selection of research projects “Life Science” financed by the “Fund for investment in basic research, FIRB” (2011)
- External examiner for awarding the PhD degree at the Universities of Milan (2010), Piemonte Orientale (2013, 2015), Nottingham, UK (2016) and Camerino (2019, 2021, 2023).
- Expert nominated by ANVUR for the selection of PhD projects within the “Programma Operativo Nazionale Ricerca e Innovazione 2014-2020” (2020).
- Member of the Commission implementing the jurisdictional measures for the granting of the National Scientific Qualification (ASN) in the sector E05/1-General Biochemistry (2018-2020)
- Member of the Commission for the National Scientific Qualification (ASN) in the sector E05/1-General Biochemistry (2021-2023)
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### **COLLABORATIONS WITH BIOTECH COMPANIES**

2011 – 2022	academic collaborator for TES Pharma (Perugia, Italy), a company focusing on drug discovery against key targets in metabolic diseases and oncology, providing expertise in Biochemistry and Enzymology
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### **SCIENTIFIC ACTIVITY**

Since 1986, Prof. Raffaelli’ s research has been mostly focused on the enzymology of nucleotides metabolism. By combining bioinformatic analyses, structural studies and biochemical techniques, she identified and characterized key regulatory enzymes of NAD metabolism in bacteria, archaea and eukaryotes. She contributed to define how the various metabolic pathways leading to NAD biosynthesis in mammals are affected depending on the cell-type and metabolic status, and how

alteration of the intracellular NAD pool impacts on energy metabolism and inflammation. She also contributed to the characterization of enzymes involved in the metabolism of pyrimidine nucleotides, the biosynthesis of cyclic-di-GMP and the metabolism of dinucleotides endowed with signaling functions.

Her scientific production is reported in several publications in International Journals with impact factor, and more than 100 communications to National and International Meetings. She has been invited as lecturer at several international and national Meetings. She also contributed to several reviews on the enzymology of NAD metabolism, and a few of these reviews have been considered of outstanding value from referees.

Prof. Raffaelli has been reviewer of several papers for international Journals, including Biomolecules, Structure, Nature Communication, Cell Metabolism, Frontiers in Immunology, Applied and Environmental Microbiology

### **BIBLIOMETRIC INDICATORS (at February 2025)**

108 articles (Scopus)

h-index: 37 (excluding self-citations)

Sum of Times Cited without self-citations: 3898

### **RESEARCH SUPPORT IN THE LAST TEN YEARS**

02/2016- 01/2019 - Research grant MR/N004582/1 - MEDICAL RESEARCH COUNCIL- *Variability in human axon survival*- **CoPI**- The goal of this project was the biochemical and functional characterization of variants of the enzyme NMNAT2 associated with neuropathies

01/ 2017-12/2018- PROGETTO STRATEGICO DI ATENEIO- UNIVERSITA' POLITECNICA DELLE MARCHE- *Edible insects: new frontiers in food (FoodIN)* – **CoPI** - The goal of this project was the characterization of the biochemical and nutritional features of *Tenebrio molitor* larvae reared on various feed substrates

29/08/2019– 28/02/2023 - PRIN2017CBNCY - MIUR - *Understanding and targeting the extracellular NADome in inflammation* – **PI** - The goal of this project is to characterize the enzymes and the metabolites of the NAD biosynthetic pathways which are active in the extracellular environment.

01/2020-06/2023 - Bando Ricerca Scientifica di Eccellenza 2018 - Fondazione Cariverona - *Structure-based insights into the inflammatory functions of extracellular NAD biosynthetic enzymes* - **PI** -The goal of this project is to structurally characterize the interaction between extracellular NAD biosynthetic enzymes capable of triggering an inflammatory response and their receptor.

### **PATENTS**

Roberto Pellicciari Johan Auwerx, **Nadia Raffaelli** (2016)

Inhibitors of alpha-amino-beta-carboxymuconic acid semialdehyde decarboxylase

US2016/0060226A1, TES PHARMA S.r.l. Corciano (Italy)

### **PEER-REVIEWED PUBLICATIONS IN THE LAST TEN YEARS**

Sorge M, Savoré G, Gallo A, Acquarone D, Sbroggiò M, Velasco S, Zamporlini F, Femminò S, Moiso E, Morciano G, Balmas E, Raimondi A, Nattenberg G, Stefania R, Tacchetti C, Rizzo AM, Corsetto P, Ghigo A, Turco E, Altruda F, Silengo L, Pinton P, **Raffaelli N**, Sniadecki NJ, Penna C, Pagliaro P, Hirsch E, Riganti C, Tarone G, Bertero A, Brancaccio M.

An intrinsic mechanism of metabolic tuning promotes cardiac resilience to stress

*EMBO Mol Med* 16 (10), 2450-2484, DOI: 10.1038/s44321-024-00132-z, 2024

Ponzone L, Audrito V, Landi C, Moiso E, Levra Levron C, Ferrua S, Savino A, Vitale N, Gasparrini M, Avalle L, Vantaggiato L, Shaba E, Tassone B, Saoncella S, Orso F, Viavattene D, Marina E, Fiorilla I, Burrone G, Abili Y, Altruda F, Bini L, Deaglio S, Defilippi P, Menfa A, Poli V, Porporato PE, Provero P, **Raffaelli N**, Riganti C, Taverna D, Cavallo F, Calautti E.

RICTOR/mTORC2 downregulation in BRAFV600E melanoma cells promotes resistance to BRAF/MEK inhibition

*Molecular Cancer* 23 (1), 105, DOI: 10.1186/s12943-024-02010-1, 2024

Ravishankar S, Baldelli V, Angeletti C, **Raffaelli N**, Landini P, Rossi E.

Fluoropyrimidines affect de novo pyrimidine synthesis impairing biofilm formation in *Escherichia coli*

*Biofilm* 7,100180, DOI: 10.1016/j.biofilm, 2024

Baldassarri C, Giorgioni G, Piergentili A, Quaglia W, Fontana S, Mammoli V, Minazzato G, Marangoni E, Gasparrini M, Sorci L, **Raffaelli N**, Cappellacci L, Petrelli R, Del Bello F.

Properly Substituted Benzimidazoles as a New Promising Class of Nicotinate

Phosphoribosyltransferase (NAPRT) Modulators

*Pharmaceuticals* 16 (2), 189, DOI: 10.3390/ph16020189, 2023

Minazzato G, Marangoni E, Fortunato C, Petrelli R, Cappellacci L, Del Bello F, Sorci L, Gasparrini M, Piacente F, Bruzzone S, **Raffaelli N**.

A Versatile Continuous Fluorometric Enzymatic Assay for Targeting Nicotinate

Phosphoribosyltransferase

*Molecules* 28 (3), 961, DOI: 10.3390/molecules28030961, 2023

Minazzato G, Gasparrini M, Heroux A, Sernova N, Rodionov DA, Cianci M, Sorci L, **Raffaelli N**.

Bacterial NadQ (COG4111) is a Nudix-like, ATP-responsive regulator of NAD biosynthesis

*Journal of Structural Biology* 214 (4), 107917, DOI: 10.1016/j.jsb.2022.107917, 2022

Rosell AL, Paglione M, Gilley J, Kocia M, perillo G, Gasparrini M, Cialabrini L, **Raffaelli N**, Angeletti C, Orsomando G, Wu P, Coleman MP.

The NAD<sup>+</sup> precursor NMN activates dSarm to trigger axon degeneration in *Drosophila*

*eLife*, 11, e80245, DOI: 10.7554/ELIFE.80245, 2022

Foligni R, Mannozi C, Gasparrini M, **Raffaelli N**, Zamporlini F, Tejada L, Bande-de Leòn C, Orsini R, Manzi P, Di costanzo MG, Ritota M, Aquilanti L, Mozzon M.

Potentialities of aqueous extract from cultivated *Onopordum tauricum* (Willd.) as milk clotting agent for cheesemaking

*Food Research International* 158, 111592, DOI: 10.1016/j.foodres.2022.111592, 2022

Fortunato C, Mazzola F, **Raffaelli N**.

The key role of the NAD biosynthetic enzyme nicotinamide mononucleotide adenylyltransferase in regulating cell functions

*IUBMB Life* 74 (7), 562-572, DOI: 10.1002/iub.2584, 2022

Cianci M, Giacchè N, Cialabrini L, Carotti A, Liscio P, Rosatelli E, De Franco F, Gasparrini M, Robertson J, Amici A, **Raffaelli N**, Pellicciari R.

Structural Basis of Human Dimeric  $\alpha$ -Amino- $\beta$ -Carboxymuconate- $\epsilon$ -Semialdehyde Decarboxylase Inhibition With TES-1025

*Frontiers in Molecular Biosciences* 9, 834700, DOI: 10.3389/fmolb.2022.834700, 2022

Gasparrini M, Mazzola F, Cuccioloni M, Sorci L, Audrito V, Zamporlini F, Fortunato C, Amici A, Cianci M, Deaglio S, Angeletti M, **Raffaelli N.**

Molecular insights into the interaction between human nicotinamide phosphoribosyltransferase and Toll-like receptor 4

*Journal of Biological Chemistry* 298(3), 101669, DOI: 10.1016/j.jbc.2022.101669, 2022

Garofalo C, Sabbatini R, Zamporlini F, Minazzato G, Ferrocino I, Aquilanti L, **Raffaelli N**, Osimani A.

Exploratory study on the occurrence and dynamics of yeast-mediated nicotinamide riboside production in craft beers

*LWT* 147, 111605, DOI: 10.1016/j.lwt.2021.111605, 2021

Camarca A, Minazzato G, Pennacchio A, Capo A, Amici A, D'Auria S, **Raffaelli N.**

Characterization of two NMN deamidase mutants as possible probes for an NMN biosensor

*International Journal of Molecular Sciences* 22 (12), 6334, DOI: 10.3390/ijms22126334, 2021

Gasparrini M, Sorci L, **Raffaelli N.**

Enzymology of extracellular NAD metabolism

*Cellular and Molecular Life Sciences* 78 (7) 3317-3331, DOI: 10.1007/s00018-020-03742-1, 2021

Mozzon M, Foligni R, Mannozi C, Zamporlini F, **Raffaelli N**, Aquilanti L.

Clotting properties of *Onopordum tauricum* (willd.) aqueous extract in milk of different species

*Foods* 9 (6), foods9060692, DOI: 10.3390/foods9060692, 2020

Minazzato G, Gasparrini M, Amici A, Cianci M, Mazzola F, Orsomando G, Sorci L, **Raffaelli N.**

Functional characterization of COG1713 (YqeK) as a novel diadenosine tetraphosphate hydrolase family.

*J Bacteriol* 202 (10), e00053-20, DOI: 10.1128/JB.00053-20, 2020

Ruschioni S, Loreto N, Foligni R, Mannozi C, **Raffaelli N**, Zamporlini F, Pasquini M, Roncolini A, Cardinali F, Osimani A, Aquilanti L, Isidoro N, Riolo P, Mozzon M.

Addition of olive pomace to feeding substrate affects growth performance and nutritional value of mealworm (*Tenebrio molitor* L.) larvae

*Foods* 9 (3), 317, dx.doi.org/10.3390/foods9030317, 2020

Pacetti, D, Mezzetti B, Balducci F, Balzano M, Carloni P, Castiglioni S, Cianci M, Falcone PM, Frega NG, Giardinieri A, Mazzoni L, Minazzato G, **Raffaelli N**, Ruggieri S, Zamporlini F.

Food quality and functionality. In: Longhi S et al (Eds) "The First Outstanding 50 Years of "Università Politecnica delle Marche". Springer, Cham. [https://doi.org/10.1007/978-3-030-33832-9\\_35](https://doi.org/10.1007/978-3-030-33832-9_35), 2020

Gaudino F, Manfredonia I, Managò A, Audrito V, **Raffaelli N**, Vaisitti T, Deaglio S.

Subcellular Characterization of Nicotinamide Adenine Dinucleotide Biosynthesis in Metastatic Melanoma by Using Organelle-Specific Biosensors.

*Antioxid Redox Signal* 31(15), 1150-1165, DOI: 10.1089/ars.2019.7799, 2019

Managò A, Audrito V, Mazzola F, Sorci L, Gaudino F, Gizzi K, Vitale N, Incarnato D, Minazzato G,

Ianniello A, Varriale A, D'Auria S, Mengozzi G, Politano G, Oliviero S, **Raffaelli N**, Deaglio S.

Extracellular nicotinate phosphoribosyltransferase binds Toll like receptor 4 and mediates inflammation

*Nature Communications* 10 (4116), DOI: 10.1038/s41467-019-12055-2, 2019

Audrito V, Managò A, Gaudino F, Sorci L, Messina VG, **Raffaelli N**, Deaglio S.

NAD-Biosynthetic and Consuming Enzymes as Central Players of Metabolic Regulation of Innate and Adaptive Immune Responses in Cancer

*Frontiers in Immunology*, 10 (1720), DOI: 10.3389/fimmu.2019.01720, 2019

Sociali G, Grozio A, Caffa I, Schuster S, Becherini P, Damonte P, Sturla L, Fresia C, Passalacqua M, Mazzola F, **Raffaelli N**, Garten A, Kiess W, Cea M, Nencioni A, Bruzzone S.

SIRT6 deacetylase activity regulates NAMPT activity and NAD(P)(H) pools in cancer cells

*FASEB Journal* 33, 3704-3717, 2019

Roncolini A, Milanovic V, Cardinali F, Osimani A, Garofalo C, Sabbatini R, Clementi F, Pasquini M, Mozzon M, Foligni R, **Raffaelli N**, Zamporlini F, Minazzato G, Trombetta MF, Van Buitenen A, Van Campenhout L, Aquilanti L.

Protein fortification with mealworm (*Tenebrio molitor* L.) powder: effect on textural, microbiological, nutritional and sensory features of bread

*PLoS One* 14 (2) e0211747, 2019

Katsyuba E, Mottis A, Zietak M, De Franco F, van der Velpen V, Gariani K, Ryu D, Cialabrini L, Matilainen O, Liscio P, Giacchè Nicola, Stokar-Regenscheit N, Legouis D, de Seigneux S, Ivanisevic J, **Raffaelli N**, Schoonjans K, Pellicciari R, Auwerx J.

De novo NAD synthesis enhances mitochondrial function and improves health

*Nature* 563 (7731) 354- 359, 2018

Lynch JH, Sa N, Saeheng S, **Raffaelli N**, Roje S.

Characterization of a non-nudix pyrophosphatase points to interplay between flavin and NAD(H) homeostasis in *Saccharomyces cerevisiae*

*PLoS One* 13 (6) e0198787, 2018

Osimani A, Milanović V, Cardinali F, Roncolini A, Garofolo C, Clementi F, Pasquini M, Mozzon M, Foligni R, **Raffaelli N**, Zamporlini F, Aquilanti L.

Bread enriched with cricket powder (*Acheta domesticus*): A technological, microbiological and nutritional evaluation

*Innovative Food Science and Emerging Technologies* 48, 150-163, 2018

Audrito V, Managò A, Zamporlini F, Rulli E, Gaudino F, Madonna G, D'Atri S, Antonini Cappellini GC, Ascierio PA, Massi D, **Raffaelli N**, Mandalà M, Deaglio S

Extracellular nicotinamide phosphoribosyltransferase (eNAMPT) is a novel marker for patients with BRAF-mutated metastatic melanoma

*Oncotarget* 9 (27), 18997-19005, 2018

Buonvicino, D; Mazzola, F; Zamporlini, F; Resta, F; Ranieri, G; Camaioni, E; Muzzi, M; Zecchi, R; Pieraccini, G; Dolle, C; Calamante, M; Bartolucci, G; Ziegler, M; Stecca, B; **Raffaelli, N**; Chiarugi, A.

Identification of the Nicotinamide Salvage Pathway as a New Toxication Route for Antimetabolites  
*Cell Chemical Biology* 25 (4), 471-482, 2018

Thongon, N; Zucal, C ( ; D'Agostino, VG; Tebaldi, T; Ravera, S; Zamporlini, F; Piacente, F; Moschoi, R; **Raffaelli, N**; Quattrone, A; Nencioni, A; Peyron, JF; Provenzani, A.

Cancer cell metabolic plasticity allows resistance to NAMPT inhibition but invariably induces dependence on LDHA

*Cancer & Metabolism* 6 (1), 10.1186/s40170-018-0174-7, 2018

Audrito, V; Manago, A; La Vecchia, S; Zamporlini, F; Vitale, N; Baroni, G; Cignetto, S; Serra; Bologna, C; Stingi, A; Arruga, F; Vaisitti, T; Massi, D; Mandala, M; **Raffaelli, N**; Deaglio, S.  
Nicotinamide Phosphoribosyltransferase (NAMPT) as a Therapeutic Target in BRAF-Mutated Metastatic Melanoma

*JNCI – Journal of The National Cancer Institute* 110 (3), dx198, 2018

Pellicciari, R; Liscio, P; Giacche, N; De Franco, F; Carotti, A; Robertson, J; Cialabrini, L; Katsyuba, E; **Raffaelli, N**; Auwerx, J.

alpha-Amino-beta-carboxymuconate-epsilon-semialdehyde Decarboxylase (ACMSD) Inhibitors as Novel Modulators of De Novo Nicotinamide Adenine Dinucleotide (NAD(+)) Biosynthesis

*Journal of Medicinal Chemistry* 61 (3), 745-759, 2018

Amici, A; Grolla, AA; Del Grosso, E; Bellini, R; Bianchi, M; Travelli, C; Garavaglia, S; Sorci, L; **Raffaelli, N**; Ruggieri, S; Genazzani, AA; Orsomando, G.

Synthesis and Degradation of Adenosine 5'-Tetraphosphate by Nicotinamide and Nicotinate Phosphoribosyltransferases

*Cell Chemical Biology* 25 (4), 471-482, 2017

Ummarino, S; Mozzon, M; Zamporlini, F; Amici, A; Mazzola, F; Orsomando, G; Ruggieri, S; **Raffaelli, N**.  
Simultaneous quantitation of nicotinamide riboside, nicotinamide mononucleotide and nicotinamide adenine dinucleotide in milk by a novel enzyme-coupled assay

*Food Chemistry* 221, 161-168, 2017

Di Stefano, M; Loreto, A; Orsomando, G; Mori, V; Zamporlini, F; Hulse, RP; Webster, J; Donaldson, LF; Gering, M; **Raffaelli, N**; Coleman, MP; Gilley, J; Conforti, L.

NMN Deamidase Delays Wallerian Degeneration and Rescues Axonal Defects Caused by NMNAT2 Deficiency In Vivo

*Current Biology* 27 (6), 784-794, 2017

Cardinali F, Osimani A, Taccari M, Milanovic V, Garofalo C, Clementi F, Polverigiani S, Zitti S, **Raffaelli N**, Mozzon M, Foligni R, Franciosi E, Tuohy K, Aquilanti L.

Impact of thistle rennet from *Carlina acanthifolia* All. subsp *acanthifolia* on bacterial diversity and dynamics of a specialty Italian raw ewes' milk cheese

*International Journal of Food Microbiology* 255 (7-16), 2017

Osimani A, Garofalo C, Milanovic V, Taccari M, Cardinali F, Aquilanti L, Pasquini M, Mozzon M, **Raffaelli N**, Ruschioni S, Riolo P, Isidoro N, Clementi F.

Insight into the proximate composition and microbial diversity of edible insects marketed in the European Union

*European Food Research and Technology* 243 (7) 1157-1171, 2017

Sociali G, Raffaghello L, Magnone M, Zamporlini F, Emionite L, Sturla L, Bianchi G, Vigliarolo T, Nahimana A, Nencioni A, **Raffaelli N**, Bruzzone S.

Antitumor effect of combined NAMPT and CD73 inhibition in an ovarian cancer model.

*Oncotarget* 7 (3), 2968-2984, 2016

Ruggieri S, Orsomando G, Sorci L, **Raffaelli N**.

Regulation of NAD biosynthetic enzymes modulates NAD-sensing processes to shape mammalian cell physiology under varying biological cues.

*Biochim Biophys Acta* 1854(9), 1138-49, 2015

Audrito V, Serra S, Brusa D, Mazzola F, Arruga F, Vaisitti T, Coscia M, Maffei R, Rossi D, Wang T, Inghirami G, Rizzi M, Gaidano G, Garcia JG, Wolberger C, **Raffaelli N**, Deaglio S.  
Extracellular nicotinamide phosphoribosyltransferase (NAMPT) promotes M2 macrophage polarization in chronic lymphocytic leukemia.  
*Blood* 125 (1), 111-123, 2015

Ancona, February 14<sup>th</sup>, 2025

Nadia Raffaelli

A handwritten signature in black ink that reads "Nadia Raffaelli". The signature is written in a cursive, slightly slanted style.