

**Francesco Salvatore** was born in Naples, Italy (present address: Via Antonio Mancini 46, 80127 Naples). He graduated in 1956 in Medicine (M.D) at the University of Naples "Federico II" and obtained the PhD (1960) in Biochemistry (Biological Chemistry) from the Ministry of University and Research (Rome). From 1960 to 1967 was appointed as assistant professor and then associate professor at the same University. Since 1967, he served as Full Professor of Human Biochemistry at the Faculty of Medicine and Surgery and then at the Faculty of Biotechnological Sciences of the University of Naples "Federico II", of which he was co-founder. His current position is Emeritus Professor of Human Biochemistry at the Italian Universities (since 2010).

### ***Main positions held in the university environment***

- Director of the Biochemical Institute (University of Naples Federico II) from 1972 to 1982
- Director of the Department of Biochemistry and Medical Biotechnologies (University of Naples Federico II) from 1994 to 1995
- Director of the Post-Graduate School in Clinical Biochemistry and Clinical Chemistry from 1990 to 1996 and from 2006 to 2008
- From 2000 to 2006 Member of the Organizing Regulatory Committee of the first Faculty of Biotechnology in Italy, established at the Federico II University.
- In 2010 he was appointed Professor Emeritus at the Italian University by the Minister of Education, University and Scientific Research.
- From years '60 to the '90, for 30 yrs, in addition: teaching Professor in charge of Chemistry at the Faculty of Veterinary Medicine, University of Naples;
- **Since 2003 Professor and Member of the Academic Council of the European School of Molecular Medicine (SEMM) (President: Prof. U. Veronesi, currently Prof. P.G. Pelicci), established by the Secretary of the State of Health and of the University and Research, at Milan and Naples; he headed the Naples site of SEMM between 2003 and 2014. He was a Member of the Academic Council (7 members), and he currently is a Member of the Steering Committee nominated by the Rector of the Federico II University of Naples and he resigned from the Academic Board of teachers (which he coordinates as Dean at the site of CEINGE, Naples) .**
- From 2007 to 2010 Member of the National Committee for promotion of Health Research (NCHR), Ministry of Health, Rome, Italy
- He has served on the Italian National Research Council (CNR) multiannual Committee for the preparation of projects devoted to Oncology and the one for Biotechnology; Secretary General of the CNR International Affairs Committee for several years.
- He was Secretary General of the CNR Commission for the urbanistic settlement of the Research Area of Naples, and planning of the logistical sites of the CNR Institutes, the buildings in Via P. Castellino and that one in Via Cintia (then dismissed with their multidisciplinary connection after the earthquake).
- He was President of the Council for the Degree Courses in Health Biotechnology (2005-2008), in Medical, Pharmaceutical and Veterinary Biotechnology (2006-2009) and in Human Nutrition (2005-2008).

- **In 2018 he was appointed Scientific Director of the Center of Excellence (now become Interuniversity) "Research Center for the Study of multifactorial Genetic Diseases (Hereditary and Acquired) of Man, and their Cellular and Animal Models", at three Italian Universities, namely, the Federico II University, Tor Vergata - Rome II University, and Chieti Pescara - "Gabriele D'Annunzio" University.**
- Since 2024 he has been a member of the Scientific Committee of the II level Master in "Coordination of structures and socio-educational activities for the elderly" c/o the University of Naples "Suor Orsola Benincasa" of Naples
- - Since 2024 he has been Vice President of the Academy of Medical and Surgical Sciences of the National Society of Sciences, Letters and Arts in Naples, of which he has been a member since 1974

### ***Main positions held in other institutions***

- **From 1984 to July 2017 he was appointed President, and until June 2018, Scientific Coordinator of CEINGE-Advanced Biotechnologies of Naples, of which he was the deviser and founder. This is a non-profit consortium (Scral) between public bodies operating in the sector of Advanced Biology and Biotechnology located, since 2004, in a building covering an operational area of 8,500 m<sup>2</sup>, with a staff of over 200 researchers that share common infrastructural facilities for genomic and post-genomic research as applied to biomedicine, and medical biotechnologies. In 2022 the Scientific Center has been named "CEINGE Biotecnologie Avanzate Franco Salvatore" by the stakeholders (University of Naples Federico II, and Policlinico company of the same University)**
- In 2008, as an expert in Clinical Biochemistry and Clinical Molecular Biology, he was a member of the Technical Working Group constituted by experts in rare diseases in the Campania Region (DPGR n.258/2008). CEINGE-Advanced Biotechnology was nominated the Regional Reference Center for biochemical and genetic-molecular diagnostics including rare diseases (Regional Government Decree No. 279 of 18 May 2001), during the Presidency of Francesco Salvatore.
- Member of the Campania Region (Italy) Experts in Rare Diseases Working Group (more than 5 years); and in the group of Study and Promotion in Genetics;
- In 2006, nominated member for the CNR, Biogem and CEINGE of the Board of Directors of "Campania Bioscience" (until 2019).
- **Member of the Coordination Center on Extended Neonatal Screening (SNE) established at the Istituto Superiore di Sanità, Rome, Italy (law 167/16) (since 2017, ongoing).**
- **In 2023 appointed member of the Scientific Committee of ALISEI Life Science Cluster**

### ***Appointments, honors, awards***

- Corresponding Member (since 1974) and Regular Member (since 1981) of the Società Nazionale di Scienze, Lettere e Arti of Naples - Medicine and Surgery Academy.
- In 1982, he received the Dorso Prize for Scientific Research.

- In 1985 he was awarded the Gold Medal of the Italian Ministry of Public Education, University and Research.
- Member “Ordinario” of the “Accademia Pontaniana” (Napoli) (from 2006 )
- In 2002 he received the Certificate of Excellence from the New York Medical College (NY, USA).
- **In 2006 he was awarded the Gold Medal for the Natural and Physical Sciences of the Accademia Nazionale delle Scienze (known as *dei XL*), Rome, Italy.**
- Twice he was among the three experts nominated to be appointed as a Member of the Accademia dei Lincei in the Biochemistry and Pharmacology Section and, once, in that to be appointed as a Member “Ordinario” at the National Academy of Sciences (known as *dei XL*), Rome – Italy;
- **In 2009, he was appointed Member of the National Academy of Science (Rome), also known as Accademia dei XL”;**
- **In 2010 he was appointed Professor Emeritus of the Italian University by the Minister of Education, University and Scientific Research, Rome-Italy.**
- **For seven consecutive years he has been part of the International Commission (including 5 Nobel Prizes) for the award of the "Re Jaime I°" prize to the best Spanish Scientist in the field of Scientific Research (Valencia, Spain).**
- In 2012 he was appointed Honorary Member of the Italian Society of Biochemistry and Molecular Biology (SIB) and of the Italian Federation of Biotechnologists (FIBio).
- In 2013 he was awarded the International Prize Sebetia-Ter - section "Medicine and surgery Gianfranco Scoppa"
- In 2014 he was awarded the "Good Health" prize by the association for Good Health "L'ancora"
- **From the date of establishment he was nominated as President of the College of Full Professors of the Disciplinary Scientific Sector (SSD) BIO12, from 2009 Honorary President of the same College;**
- **In 2014 he was awarded the "Pericles International Prize", also awarded in the same year 2014 to Prof. Aaron Ciechanover (Nobel Prize 2004 for Chemistry) and to Prof. Michele Gallucci (Urology clinical at La Sapienza University of Rome).**
- In 2015 he was awarded the "Masaniello-Napoletani protagonists in the world" Award
- In 2016 he was awarded the honor as "Mentor of Laboratory Medicine" by the Italian Society of Clinical Biochemistry (SIBioC)
- In 2017 he was awarded the "PATER" Prize during the International Conference on Laboratory Medicine, by the President of the School of Medicine of Padua, in the Historical Auditorium of the University of BO - Padua.
- In December 2018 he received the Dove of Innovation Award "The reasons for the New Policy" - Rome.

- Since 2019 he is Member and President of the Physical and Natural Sciences Class c/o the Cenacle of Culture and Sciences
- Since 2021 he is Director “ Internatiolan School of Precision and Laboratory Medicine” (together with prof. Marcello Ciaccio, Palermo) c/o Ettore Majorana Foundation and Centre for Scientific Culture – Erice, (TP), Italy. (Prof. A.Zichichi, President) and since 2023 member of the academic senate of the Ettore Majorana foundation
- Since 2022 he is member of the board of directors of the cultural association Pianeta Mare Darwin Dohrn in Naples
- **In 2022, the stakeholders of the S.C.R.L. CEINGE - Advanced Biotechnologies (University of Naples Federico II and AOU of the same University) have decided to change the name (company name) of the aforementioned company to that of: CEINGE - Advanced Biotechnology Franco Salvatore, to honor the ideation, foundation, and activity for 30 years of the Centre itself.**
- **In 2022 the Board of Directors of the Zoological Station of Naples appointed prof. Salvatore as “Chair” of the Stazione Zoologica.**
- In 2022 the Italian Society of Clinical Biochemistry and Molecular Biology (SIBIOC) awarded the “Excellence in Scientific Research” award to prof. F. Salvatore for his extraordinary results in the field of scientific research in Laboratory Medicine.

### ***Visiting scientist and visiting professor for a total of about 5 years at***

- Argonne National Laboratory, Illinois, USA (Prof. Fritz Schlenk).
- Laboratoire de Biochimie Générale et Comparée, France (Prof. Jean Roche).
- European Molecular Biology Laboratory, Heidelberg, Germany (Proff. John Kendrew, Nobel Prize, and Lenn Philippon).
- Department of Biological Science, University of Illinois, Chicago, Ill., USA (Prof. Stanley K.Shapiro).
- Department of Biochemistry, University of California, Berkeley, USA (Prof. Bruce Ames)
- Laboratory of Molecular Biology, Medical Research Council, Cambridge, UK (Prof. Sidney Brenner, Nobel Prize).

### **PREVIOUS AND ONGOING RESEARCH ACTIVITIES**

- Predictive medicine at the level of genome, genes and mutations of oncological and hereditary genetic diseases, to evaluate the risk of predisposition to individual diseases through gene panels, and actually also through WGS and epigenomics (metylome).
- Molecular base pairs, diagnosis, genotype-phenotype correlations of hereditary and acquired genetic diseases and physiopathology of molecular mechanisms, rare diseases and disorders of intermediary

metabolism, cardiomyopathies, breast, colorectal and other types of tumours (also through the constitution of organoids/tumoroids).

- Functional role of *Aldolase C* protein in cerebellum development and studies with transgenic and knock-out mice.
- Molecular oncology: studies of the cross-talk between proteins in leukaemia pathogenesis; search for tumoral markers for early tumour diagnosis, prognosis and therapy; expression studies in breast tumours and other organs, also through high productivity sequencing techniques (NGS) and through gene panels (patents filed).
- Design, synthesis and physiological and pharmacological roles of analogs of human defensins (two patents filed).
- Studies of amyloid toxicity at cardiac level, and its mechanism of action.
- Nanovectors studies for drug delivery (protein corona and proteomics).

### SCIENTIFIC ACTIVITIES AND RESULTS OBTAINED

His early research focused on the nitrogen metabolism of amino acids, the ureogenetic cycle, the mechanism of ammonia detoxification, the methyltransferases also at nucleic acid level, and adenosylmethionine metabolism. Within the frame of these studies the role of non natural D-amino acids were analysed and these allowed to understand the nitrogen metabolism of the amino group (paper on “Nature”). Later, he studied the molecular biology of tRNAs, and, for many years, the structure and expression of human protein genes, in particular of the isoenzyme system of the human aldolases A, B and C, of which he identified the primary structure and the three-dimensional structure at the level of mutations to human variants and of the glyceraldehyde 3-phosphate dehydrogenase. The studies on Aldolase C are still ongoing to identify other functions in the human brain (the results obtained thus far, appear very interesting for the presence of other functions at brain level).

His research on disease-genes has led to the identification of new genes and new mutations and therefore to the molecular diagnosis of hereditary and acquired genetic diseases (including leukemias).

Finally, a series of studies have led to the identification of gene mutations in several hereditary diseases, namely cystic fibrosis, hereditary fructose intolerance, phenylketonuria, muscular dystrophy, choroideremia, and congenital ichthyosis. He has also elucidated the pathophysiological role of some of these alterations by studying the corresponding proteins. He has contributed, with a research line lasting over 12 years, to the definition of genetic predisposition of cystic fibrosis patients, which indicated an elevated penetrance of a severe hepatic complication.

**Currently, his research activity continues along the lines described above and has resulted along his scientific life in publications in international journals.** In recent years, his activity resulted in studies and

research with publications in the field of Predictive Medicine (Genomics of the predisposition to the risk of specific new diseases), and in the pathogenesis of celiac disease through the microbioma that resulted in the identification of a new disease trigger (*Neisseria flavescens*), which adds to the genetic predisposition (HLA) and to immune response to gluten.

In addition, the studies on antimicrobial proteins, of the type of/or analogues to natural defensins, are producing proteins with a lower molecular weight that are also active against bacteria resistant to antibiotics. Finally, the cardiotoxicity of immunoglobulin light chains produced results that led to the identification, through proteomic analysis, of some interaction proteins in mitochondria as possible toxicity targets.

Since a few years he is promoting the need of a “shift” of the paradigm for the meaning and the existence of the aging phenomenon. This is not due to the chronology of life, but to the association of multimorbidities within each single individual. Therefore, the visualization of Medicine scientific approaches should switch from only therapeutic aspects to the preventive ones (predictive Medicine and early diagnosis). **He is frequently invited to lecture at National and International Congresses and Symposia on topics of his competence (He was invited to deliver five scientific lectures in meetings in Italy and abroad in 2019, and three in 2020, 4 in 2021, 7 for 2022, 8 in 2023, as well as already 6 for 2024).**

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Scopus h-index: 50

citations: 10,223

no. of papers with impact factor: 384

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