

Prof. Carmelina Ruggiero PhD DIC Dr Ing

CURRICULUM VITAE

Education

- Ph.D. in Electrical Engineering applied to Medicine, Imperial College, London, 1977
- D.I.C. (Diploma of membership of the Imperial College) in applications of Electrical Engineering to Medicine and Biology, Imperial College, London, 1977
- “Laurea” Italian degree (5 years) in Electrical Engineering, University of Genoa, Italy, 1971

Position

Professor of Bioengineering at the Department of Communication Computer and System Sciences (DIST), University of Genoa since 1983

- Head of the Bioengineering and Medical Informatics Laboratory of the Department of Communication Computer and System Sciences (1984-2006)
- Head of the Nanobiotechnology and Medical Informatics Laboratory of the Department of Communication Computer and System Sciences (2006-)
- Chair of the Bachelor’s Degree course in Biomedical Engineering and of the Master’s Degree course in Bioengineering (2010-) at Genoa University.

Previous positions:

Adjunct professor of Computer Science, Electrical Engineering Institute, University of Genoa (1976-1983); Research fellow, Electrical Engineering Institute, University of Genoa (1974-1976); British Council Scholar, Imperial College, London, UK Electrical Engineering Department, Engineering in Medicine Laboratory (1972-1974).

Career related activities

- Founding Editor-in-Chief, IEEE Transactions on NanoBioscience (2002-2007)
- Invited lectures:
 - “Molecular Cellular and Tissue Engineering: a review” Plenary Lecture, The Anglo-Japanese Healthcare Conference - London 29 - 31 March 2001
 - “Cellular Engineering: present state and future development” Plenary Lecture, 2nd European Medical and Biological Engineering Conference EMBEC’02, Vienna (Austria): Dec. 04 - 08, 2002
 - “Genomics and nano-molecular aspects in cellular and tissue engineering”, Plenary Lecture, The Second International Forum on

Post-Genome Technologies, Genomic Analysis and Bio-Nanoscience (2'IFPT) Nanjing, May 26-27, 2004

- “Nanobiotechnology for Synthetic Biology” Plenary Lecture, Royal Academy of Engineering UK Focus for Biomedical Engineering, London 19th July 2005
 - “Nanobioscience: an overview” Plenary Lecture, SouthEast Collaborative Alliance Biocomputing Center (SECABC 2005) Symposium, Atlanta, Georgia 27 October 2005
 - “Nanotechnology and Personalized Medicine” Keynote Lecture, IEEE-NANOMED 2008, Suzhou(China) 6-9 November 2008
 - “Emerging Biological Nanosystems” in Pre-conference workshop, IEEE-EMBC 2010, Buenos Aires (Argentina) August 31 - September 4 2010
 - “Trends and Prospects in Nanobiotechnology and Molecular Bioengineering” Keynote Lecture, ANDESCON 2010 - IEEE ANDEAN COUNCIL CONGRESS,BOGOTÁ (Colombia)
 - “Nanofabrication for Targeted Drug Delivery” in Pre-conference workshop, IEEE-EMBC 2011, Boston (USA) August 30 - September 3 2011
- Conference Chair:
 - First IFMBE Anglo-Italian meeting on Bioengineering, Genoa (Italy) September 1977 (together with Prof. R.I. Kitney (Imperial College, London))
 - IEEE-EMBS Special Topic Conference on Molecular, Cellular and Tissue Engineering, 2002 Genoa (Italy) 6-9 June 2002
 - The IASTED International Conference on Biomedical Engineering Biomed 2006,Innsbruck (Austria) February 15 - 17, 2006
 - IEEE Nano 2009, Genoa(Italy) 26-30 July 2009
 - Member of the Administrative Committee of EMBS/IEEE (2002-2007)
 - Chair of the Technical Committee on Nanobiotechnology and Molecular Bioengineering of IEEE/EMBS (2008-2010)
 - Co-Chair of the Technical Committee on Energy of IEEE/Nanotechnology Council (2010-)
 - Member of the Administrative Committee of the IEEE Nanotechnology Council (2003-2010)
 - Involvement in the organisation of several Conferences, including Conferences organised by IEEE/EMBS, IFMBE, BMES, IOMP. Track chair/chair of sessions in some of such Conferences.
 - Referee for several international journals, including the IEEE Transactions on Biomedical Engineering, the IEEE Transactions on Medical Imaging, Medical &

Biological Engineering & Computing, Signal Processing, the Journal of Computational Chemistry and the Journal of Microbiological Methods

- Evaluator of grants applications for the European Union (4th, 5th, 6th and 7th Framework), for the EPSRC (UK), for the Swedish Research Council and for Italian sponsoring bodies
- Member of Committees for selection in competitions for positions in Italian Universities and in the Italian Research Council
- Project Technical Advisor for the EU (7th Framework)
- Member of the Working Party on Nanotechnology of the OECD (2010-)
- Current professional membership: IEEE/EMBS, IFMBE/AIIMB, AEIT, IEE, ESB, TCES

Teaching

I was first appointed as an adjunct professor at Genoa University in 1976. I taught courses on computer science until 1983, when I was appointed as professor of Bioengineering. Since then, I taught undergraduate and postgraduate level courses within the Bioengineering areas. In addition, I have taught courses for medical doctors training within the Medicine Faculty since the 80's.

- At present I am teaching courses at the Engineering Faculty on:

Biomedical Signal and Image Analysis

The main topics include: sampling theory, waveform reconstruction and aliasing, Fourier series, discrete Fourier transform, FFT algorithm, linear systems, Z transform, digital filtering

Bioinformatics

The main topics include: computer modelling for cellular and molecular systems, integrative data analysis methods, ontology, functional analysis of genes, pathway analysis, metabolic pathways, infrastructure and data management, post genomic approaches for diagnosis and treatment, docking algorithms

Cell and Tissue Engineering

The main topics include: cellular systems from the atomic level to the cellular level, cell culture techniques and bioreactors, tissue regeneration and repair, biocompatibility, intermolecular and surface forces, specific tissue engineering problems with special reference to bone, cartilage and nerve, targeted drug delivery

- I have taught courses for Specialization Training for Medical Doctors at the Medicine Faculty of Genoa University.

Specifically:

- Training in Cardiosurgery
 - "Introduction to medical informatics" 1990-97

- “Introduction to Bioengineering” 1993-2001
 - “Bioengineering” 1997-
 - Training in Orthopaedics and Traumatology
 - “Bioengineering” 1990-98
 - “Biomechanics” 1998-2002
 - Training in Pysichiatry
 - “Informatics” 1990-97
 - Training in General Surgery
 - “Informatics” 1991-
 - “Electronic Bioengineering” 2002-09
 - “Chemical Bioengineering” 2002-09
 - “Mechanical Bioengineering” 2002-09
 - Training in Microbiology and Virology
 - “Automation and computing in clinical microbiology” 1993-2000
 - Training in Vascular Surgery
 - “Informatics” 1999-2010
- I have supervised over seventy students for B.Sc./M.Sc. Theses and fourteen Ph.D. students (this number of Ph.D. students is one of the highest in Genoa University, considering the very low number of grants given in Italy to support Ph.D. Students)

Administrative and financial management experience

As a member of the Board of the Engineering Faculty and of the board of DIST (Department of Communications, Computer and System Sciences), I have been involved in all decisions about the establishment of new positions and their financial aspects and about the acquisition of space by the Engineering Faculty, by DIST and by my Laboratory. In addition to my activity on the Board of the Engineering Faculty and of DIST, due to my membership of the steering committee of DIST with the special assignment of finances, I have dealt very specifically with all financial Department activities in the period 1996-2000.

The establishment of new positions and related funding is one of the main topics which are very frequently debated, in Genoa as in most Italian Universities. Funding for University is continuously decreasing, and the relative weight of different scientific areas in relation to funding and careers is always one of the main reasons for discussions.

Genoa University has serious problems as relates to space, because it does not have a campus outside the town, but the University buildings are mixed with the houses, in the central area of the town. Engineering is in the worst situation if compared

with the other Faculties in Genoa University in this respect. Because of this, the acquisition of new spaces is given much attention. Several years ago, in the Board of Faculty we have made the decision acquiring new space by building a new wing. Moreover, we have examined several possibilities of acquiring a new campus for Engineering. In the late 90s we have established a new campus in Savona, a town in the same region as Genoa, and at the moment possibilities to move the whole Engineering Faculty from the centre of Genoa to its outskirts are frequently discussed.

As relates to space, in DIST our most important achievements in the last decades are the acquisition of spaces for the Department as a consequence of the building of the new wing of the Faculty (see above) and the launch of specific courses in Savona, with the possibility of acquiring space and opening new positions in the Department.

In the late 90s, as a consequence of the extension of my research activity from software-based aspects to experimental aspects, acquiring further spaces for wet laboratories for my group became a necessity. In the last years, I have set up a cell culture laboratory, an optical-physics laboratory and a nanobiofabrication laboratory within DIST, overcoming many difficulties.

I have managed the funding for the research projects of which I am principal investigator since the 80s within DIST. Moreover, from 2006 to 2009 I have been the coordinator of an EU funded project which has 12 partners in 6 European countries (CARDIOWORKBENCH, see details below).

I have taken care of the administration and financial aspects of several meetings, some of which in relation to research projects, and specifically of three international conferences that I have chaired: Biomedical Engineering, September 1977, Genoa, Italy IEEE-EMBS/Special Topic Conference on Molecular, Cellular and Tissue Engineering, June 2002, Genoa, Italy; IEEE Nano 2009, July 2009, Genoa, Italy.

Other administrative and financial responsibilities are related to my role as Editor in Chief of the IEEE Transactions on NanoBioscience (2002-07), and to my membership of the Administrative Committee of IEEE/EMBS (2002-07) in 2001 and 2002 and of the Administrative Committee of the IEEE/Nanotechnology Council (2003-2010).

Moreover, my evaluations for grant applications for the EU and for EPSRC take into account also the administrative-financial aspects of the proposals.

Responsibilities

- Member of the Steering Committee of the Department of Communication Computer and System Sciences (1996-2000) Special assignment: finance
- Member of the Steering Committee of the Department of Communication Computer and System Sciences (2007-)
- Member of the Board of Faculty of Engineering

- Member of the Committee for the Organisation and Planning of the teaching activities for the degree in Electronics (1983-1996)
- Member of the Committee for the Organisation and Planning of the PhD course in Bioengineering (1984-2007)
- Member of the Committee for the Organisation and Planning of the PhD course in Nanotechnology (2008-)
- Member of the Committee for the Organisation and Planning of the teaching activities for the degree in Biomedical Engineering (B-Sc) and in Bioengineering (M-Sc) (1997-)
- Chair of the B-Sc Degree course in Biomedical Engineering and of the M-Sc Degree course in Bioengineering (2010-)
- Member of the International Relations Committee of the Engineering Faculty, as representative for the degree in Biomedical Engineering and Bioengineering
- Member of the Committees for the Organisation and Planning of the specialization courses in: Cardiosurgery (1990-), Orthopaedics and Traumatology (1990-2002), Pysichiatry (1990-1997), General Surgery(1991-), Microbiology and Virology (1993-2000), Vascular Surgery(1999-2011)

Main research interests

Nanobiotechnology and molecular bioengineering, drug design, cell and tissue engineering, computer based modelling, bioinformatics, biomedical data and signal analysis.

Research Projects and funding

Research grants both from national sources (Italian Research Council, Ministry of University and Research, Ministry of Health, Scientific and Technological Park of Liguria Region) and from the European Union (within the AIM Programme - 3rd Framework; within the Programmes Biomed 2, Info2000, Telematics Applications - 4th Framework; within the Quality of Life Programme - 5th Framework; within the Life sciences, genomics and biotechnology for health Activity area and within the Nanotechnologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices Activity area - 6th Framework).

Funding in the last 15 years: about € 5,000,000

Specifically:

Clin. Oncology Network for Quality in Eur. Standard of Treatment (CONQUEST).

TelematicsApplicationsProgram-EU-4thFramework (1996-99)

The aim of the project was to improve the treatment of oncologic diseases on an European scale. The project focused specifically on radiotherapy and chemotherapy.

€14,320

Breast Cancer Information Kit (BREAK-IT), Info2000 Program- EU-4th Framework (1997).The project focused on educational aspects about breast cancer. Knowledge

dissemination for the general public was achieved through web based tools, electronic support and publication of a book.

€25,400

Bioartificial Organs and Tissues. Biomed2 Program- EU-4th Framework (1997-2000)

The project focused on a co-ordinated, inter-disciplinary, programme which aimed at advancing knowledge in critical cellular aspects of the field of organ and tissue repair and replacement. The main objective was to improve prospects for the successful development and use of selected bioartificial tissues and organs.

€41,320

Cellular Engineering. Project sponsored by the Italian Dept of University and Res. (1997-2000).

This project focused on modelling of the cell structure and function and on cell culture onto substrates, with special reference to retina cells.

€5,160

A database for radiol. images funded by the Scient. and Techn. Park of Liguria (STPL)(1998-2001).

The project focused on the design and implementation of a general database of radiological images starting from the system present at the San Martino Hospital in Genoa.

€44,800

Methods for rapid identification of bacteria in water funded by STPL (1998-2001)

The aim of the project was to develop an innovative identification system based on the use of neural networks. Gas chromatography data were analyzed

€100,240

NERVE, Neural Tissue Eng. Cell Factory Key Action Qual. of Life Program -EU-V Framework (1998-2002)

The overall aim was to develop novel cell engineered 'bioartificial nerve grafts' with which to optimise and dramatically improve, surgical peripheral nerve (PN) repair (and potentially, spinal injuries). Simultaneously, it provided a paradigm for tissue repair engineering in general.

€135,700

BITES, Biomechanical Interactions in Tissue Eng. and Surg. Repair Cell Factory Key Action Qual. of Life Program -EU-V Framework (1999-2003)

The overall aim of this project was to conduct multidisciplinary research to create bioartificial organs capable of functional load bearing, linking partners from research institutes, emerging industries and hospital end-users. In particular the project aimed to investigate the use of autologous cell seeded resorbable scaffolds for replacing load bearing tissues, cartilage and bone, with a specific application of osteochondral defects.

€107,320

Artificial Intelligence Based Software for Industrial Applications. Gensym Company (2000-01).

The aim of the project was the translation of meta-languages for software implementation for process control.

€10,300

Tissue engineering for Retina sponsored by the Italian Dept. of University and Res. (2001-2003).

The project focused on the study of the process leading to the formation of the retinal mosaic and on the role of the retinal cell cytoskeleton. The project brought together experimental work and mathematical modelling.

€49,580

Grant for work on cellular engineering, from Genova University

€10,850

PLANT, Quality of life program-EU-V-Framework (2001-04)

The aim of the project was to explore artistic masterpieces in several other European countries so as to compare and contrast the wider symbology and use of the plants. A database was implemented and electronic and informatics tools for knowledge transfer to the general public were set up.

€115,170

ADHESTOP, Nanobiotechnology for peritoneal catheterism, Growth program-EU-V-Framework (2001-04)

Medical device associated infections are thought to strongly involved with the attachment of bacteria to the device surface. Therefore the primary goal of the project was the establishment of an optimal function of a catheter surface by making highly specific biomimetic modifications in order to avoid bacterial adhesion as the prerequisite of infections. The main purpose of this project was to create a thin but very stable anti-adhesive barrier onto different polymer surfaces.

€85,260

ASIA RESIST, identification of bacteria in water, Quality of life program EU-V-Framework (2005-08)

Core objectives: assessment of the extent of antibiotic resistance in the aquaculture environment in South East Asia (SEA); Assessment of the potential for transfer of antibiotic resistance from the aquaculture environment to the broad public environment; Identification of critical control points (CCP) where south East Asian fish farmers can apply monitoring systems to prevent or eliminate antibiotic resistance

€18,630

Grant from the Italian Ministry for foreign Scientist- research project on bioreactors and on the design of a near-infrared spectroscope (2004-07)

€297,480

TASNANO, Tools and Technologies for the Analysis and Synthesis of Nano Structures, EU-VI Framework (2005-08)

The project focuses on nanotechnologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices and on the development of a new generation of tools for molecular level characterization and manipulation methods

€156,000

CARDIOWORKBENCH, Drug Design for Cardiovascular Diseases: Integration of In Silico and in Vitro, Life sciences, genomics and biotechnology for health Activity area EU-VI Framework. (2006-09) - *Project coordinator*

The aim of this project is to discover new factors involved in atherogenesis and their related CAD and set up systems to select and test molecules that are pharmacologically active for the treatment of CAD. The project combines computational (bioinformatics, cheminformatics and bioengineering) and experimental (clinical medicine and biology) expertises

€ 3,038,103

DEVELOPMENT OF NEW TECNOLOGIES FOR THE PRODUCTION OF BIOLOGICAL MOLECULES WITH ANTICANCER ACTION

Grant from the Italian Ministry of Health (2005-08).

The project aims to identify experimental systems able to increase the production of taxol in vegetable species different from yew tree. The project includes the production of culture transformed by genes involved in the biosynthesis of taxol and the evaluations of genomic stability of genetically modify plants.

€ 40,000

IDRO-RIN TRANS-GENESI

Grant from the Italian Ministry for University and Scientific Research (2011-)

The project focuses on technologies for large scale generation of hydrogen from renewable sources for transportation (land and sea) and for distributed generation.

€ 500,000

LANIR

EU-VII framework program (2012-)

The project focuses on label free nanoscopy using infra red and on tools and methodologies for imaging structures and composition at the nanometre scale.

€ 250,000

Main international collaborations and contacts

Within the genomics and proteomics area:

Artificial Intelligence Research Group, and Bioinformatics Research Group, University of Ulster (UK) (Dr Francisco Azuaje); Imperial College (UK) (Prof. R.I Kitney); Istituto per lo studio delle macromolecole, National research Council (Dr. Patrizio Arrigo) (I); School of Electrical and Computer Engineering, RMIT University (AU) (Prof. Irena Cosic) ; Institute of Biomedical Technologies, National research Council (I) (Dr. Luciano Milanese); Istituto Nazionale per la Ricerca sul Cancro (I) (Dr Mattia Rocco)

Within the cellular and tissue engineering area:

Centre for Cell Engineering, University of Glasgow (UK) (Prof. Adam Curtis); Plastic and Reconstructive Surgery Tissue Repair Unit, University College London (UK) (Prof Robert Brown); Institute for Bioprocessing and Analytical Measurement Techniques, Heilbad Heiligenstadt (D) (Prof. Klaus Liefeith); University of Leipzig, Center of Biotechnology and Biomedicine (D) (Prof. Andrea Robitzki); Vienna Medical University, Department of Anatomy, Cell Biology and Human Genetics (AT) (Prof. Seyedhossein Aharinejad); Department of Pharmacological Sciences, University of Milan (I) (Prof Alberto Corsini); Ecole Polytechnique de Montréal, Quebec (Prof. L'Hocine Yahia); MIT-Harvard (USA) (Prof. Ali Khademhosseini)

Within the nanotechnology/nanobiotechnology area:

Institute National Polytechnique de Lorraine (FR) (Prof. Jerzy Mielczarski); Rutherford Appleton Laboratory (UK) (Dr Ejaz Huq); National Center for Scientific Research "Demokritos" (GR) (Prof. Nikos Glezos); University of Kassel (D) (Prof. Ivo Rangelow)

Within the bioinformatics and medical informatics area:

University of Tartu, Department of Chemistry (EE) (Dr Uko Maran); Bielefeld University, Bioinformatics Department (D) (Prof Ralf Hofstadt)

Within computer modelling area:

Fraunhofer Institute for Biomedical Engineering (D) (Dr Hagen Thielecke); Institute for Bioprocessing and Analytical Measurement Techniques, Heilbad Heiligenstadt (D) (Prof. Klaus Liefeith)

Industries

Pharmaceutical companies: Pharmacelsus (D); Novamass (FI); Sigma Tau (I), Chemilia (SE), Amgen (USA)

Biotechnological companies: FIDIA (I)

Nanotechnological companies: The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (NO); Microsystems Ltd (BU); Nanoworld Services GmbH Ltd. (D); AlphaContec GmbH (D)

Biomedical companies: Esaote (I)

Software companies: Gensym (I)

Publications

Author or co-author of over 350 research articles, book chapters and conference communications

International journals

1. B. McA. Sayers, C. Ruggiero and J. Feuerlicht, "Statistical variability of biomedical data: Part 1. The influence of serial correlation on mean value estimates, Medical Informatics, Vol. 6 (1), 1-11, 1981
2. B. McA. Sayers, C. Ruggiero and J. Feuerlicht, "Statistical variability of biomedical data: Part 2. The influence of serial correlation on power

- estimates and on comparative testing of sample means", *Medical Informatics*, Vol. 6 (3), 207-220, 1981
3. P. McA. Sayers, L.S. Sandoval and C. Ruggiero, "Statistical sampling strategies for averaging purposes in serially correlated biomedical data", *Medical Informatics*, Vol. 6, 271-278, 1981
 4. B. McA. Sayers, A. Foster, H.A. Beagley and C. Ruggiero, "EEG power variability and its relation to auditory evoked cortical potentials", *Medical Informatics* Vol. 8 (4), 233-241, 1983
 5. P. Morasso, F.A. Mussa Ivaldi and C. Ruggiero, "How a discontinuous mechanism can produce continuous patterns in trajectory formation and Handwriting", *Acta Psychologica* 54, 83-98, 1983
 6. S. Gaglio, C. Ruggiero, G. Spinelli, G. Bonadonna, P. Valagussa and C. Nicolini, "BREASTCAN an expert system for postoperative breast cancer therapy", *Computers and Biomedical Research* Vol. 19, 445-461, 1986.
 7. C. Ruggiero and B. McA. Sayers, "A structural model of the thoracic cage in the cat", *J. Theor. Biol.*, 119, 161-180, 1986
 8. S. Gaglio, M. Genovesi, C. Ruggiero and G. Spinelli, C. Nicolini, G. Bonadonna and P. Valagussa, "Expert systems for cancer chemotherapy", *Comput. Math. Applic.*, Vol. 14 (B. 9-12), 793-802, 1987
 9. C. Ruggiero, B. McA Sayers, T.A. Sears and P.A. Kirkwood, "Spatio-temporal characterization of intercostal activity during breathing in the cat", *J. Theor. Biol.*, 125, 125-140, 1987
 10. G. Ardizzone, F. Bonadonna, S. Gaglio, R. Marcenò, C. Nicolini, C. Ruggiero and F. Sorbello, "Artificial Intelligence Techniques for cancer treatment planning", *Med. Inform.*, Vol. 13, 199-210, 1988
 11. F. Beltrame, M.L. Rolandelli, C. Ruggiero, G. Sandini and V. Tagliasco, "Biomedical image processing and artificial intelligence techniques", *Boll. Soc. Ital. Biol. Sper.*, Vol. 64 (12), 135-142, 1988
 12. C. Nicolini, S. Gaglio and C. Ruggiero, "Artificial intelligence techniques for the control of cancer cells", *Cell Biophysics*, Vol. 14, 117-127, 1989
 13. G. Ardizzone, F. Bonadonna, S. Gaglio, C. Nicolini, C. Ruggiero, F. Corbello, "Qualitative modelling of cell growth processes, *Applied Artificial Intelligence*", 251-263, 1988
 14. F. Cardinali, F. Grosso, C. Ruggiero and G. Sandini, "A consultation system for recognition of human body segments from tomograms", *Artificial Intelligence in Medicine*, Vol. 1, 125-130, 1989
 15. P. Morasso and C. Ruggiero, "Human face representation by means of polynomial expansion of the harmonic descriptors of tomograms", *Computerized Medical Imaging and Graphics*, Vol. 14 (6) , 389-394, 1990
 16. S. Gaglio, M. Giacomini, A. Ponassi, C. Ruggiero, "An OPS5 implementation of qualitative reasoning about physical systems", *Applied Artificial Intelligence*, Vol. 4, 37-66, 1990
 17. S. Gaglio, M. Giacomini, C. Nicolini and C. Ruggiero, "A qualitative approach to cell growth modelling and simulation for cancer chemotherapy", *IEEE Transactions on Biomedical Engineering*, Vol. 4, 386-389, 1991
 18. M. Giacomini, C. Ruggiero and R. Sacile, "A decisional system for protein secondary structure prediction in an object oriented environment", *ITBM*, vol. 12, n° 6, pp. 663-671, 1991

19. F. Bonadonna, S. Gaglio, M. Giacomini e C. Ruggiero, "Visual knowledge processing in computer assisted radiology: a consultation system". *Medical Informatics*, vol. 17, n° 1, 11 - 19, 1992
20. C. Ruggiero, R. Sacile, "Towards a protein tertiary structure prediction using a neural network algorithm", *Physica Medica*, n. 9, suppl. 1, 4-8, 1993
21. C. Ruggiero, M. Giacomini e S. Gaglio, "A qualitative model of the dynamics of blood glucose and its hormonal control", *Computer methods and programs in biomedicine*, vol. 40, 117-130, 1993
22. C. Ruggiero, R. Sacile, and G. Rauch, "Peptides secondary structure prediction with neural networks: a criterion for building appropriate learning sets", *IEEE Trans. Biomed. Eng.*, vol. 40, n. 11, 1114-1121, 1993
23. C. Ruggiero, M. Giacomini, L. Callegari, R. Berti, S. Bertone, L. Casareto, "Interpretation of gaschromatographic data via artificial neural networks for the classification of marine bacteria", *Cytotechnology*, vol. 11, n° 1, 83-85, 1993
24. C. Ruggiero, M. Giacomini, O. E. Varnier, S. Gaglio, "A qualitative process theory based model of the HIV-1 virus-cell interaction", *Computer methods and Programs in Biomedicine*, vol. 43, 255 - 259, 1994
25. R. Sacile, C. Ruggiero, P. Ballestrero, L. D. Possani, G. Prestipino e G. Rauch, "Secondary structure of noxiustoxin and charybdotoxin from hydropathy power spectra", *Biochemical and Biophysical Research Communications*, vol. 201, n. 1, 186-193, 1994
26. M. Giacomini, C. Ruggiero, S. Gaglio, "Qualitative reasoning for AIDS treatment", *The Journal of Clinical Computing*, vol. 23, n° 2&3, 2-10, 1994
27. M. Giacomini, C. Ruggiero, R. Sacile, "An object programming based environment for protein secondary structure prediction", *Frontiers of Medical and Biological Engineering*, vol. 7, n. 2, 111-128, 1996
28. P. Ballestrero, P. Baglietto and C. Ruggiero, "Molecular dynamics for proteins: performance estimation on massively parallel computers based on mesh networks", *Journal of computational chemistry*, vol. 17, n. 4, 469-475, 1996
29. R. Sacile, C. Ruggiero, M. Giacomini, L. Repetto, A. Venturino, "ISDN technology for cancer patient assistance at home", *Medical & Biological Engineering & Computing*, vol. 34, suppl. 1, part 1, 33-34, 1996
30. M. Giacomini, C. Ruggiero, F. Lillo, J. McDermott, O. Varnier, "A software tool to extend the quantification power of a virological analysis", *Medical & Biological Engineering & Computing*, vol. 34, suppl. 1, part 1, 71-72, 1996
31. R. Sacile, C. Ruggiero, M. Giacomini, C. Lombardo, T. Wiley, "A WWW site for substaining oncological studies", *Medical & Biological Engineering & Computing*, vol. 34, suppl. 1, part 1, 393-394, 1996
32. R. Sacile, C. Ruggiero, R. Dieng, "Applying CommonKADS to Oncology", *Medical & Biological Engineering & Computing*, vol. 34, suppl. 1, part 1, 397-398, 1996
33. C. Ruggiero, R. Sacile, "Using artificial neural nets to identify ductus arterious status in preterm infants", *Medical & Biological Engineering & Computing*, vol. 34, suppl. 1, part 1, 399-400, 1996
34. C. Ruggiero, M. Giacomini, R. Sacile, E. Musizzano, P. Lavazelli, P. Pregliasco, G. Caorsi, "Validating the EPIC prototype in Savona: the local data base", *Medical & Biological Engineering & Computing*, vol. 34, suppl. 1, part 1, 411-412, 1996

35. C. Ruggiero, M. Giacomini, P. Morasso, L. Baratto, "A Paradox implementation of a multimodal database for motor disable patient management", *Medical & Biological Engineering & Computing*, vol. 34, suppl. 1, part 1, 413-414, 1996
36. C. Ruggiero, M. Giacomini, R. Sacile, T. Vesanen, M. Koskivirta, L. Finlay, L. Boydell, V. Karounou, E. Jones, B. Goldberg, "Data and functional models for a european prototype for integrated care", *ITBM*, vol. 17, n. 3, 205-215, 1996
37. S. Bertone, M. Giacomini, C. Ruggiero, C. Piccarolo, L. Calegari, "Automated systems for identification of heterotrophic marine bacteria by using their fatty acid composition", *Applied and environmental microbiology*, vol. 62, n. 6, 2122-2132, 1996
38. R. Sacile, C. Ruggiero, R. Dieng, "Using Common KADS to create a conceptual model of a guideline system for breast cancer prognosis", *Medical Informatics*, vol. 21 n. 1, 45-59, 1996
39. M. Giacomini, C. Ruggiero, M. Maillard, F.B. Lillo, O.E. Varnier, "Objective evaluation of two markers of HIV-1 infection (p24 antigen concentration and CD4+ cell counts) by a self organising neural network", *Medical Informatics*, vol. 21, n. 3, 215-228, 1996
40. C. Ruggiero, R. Sacile, M. Giacomini, G. Nicolò, "Multimedial user-friendly tools for telepathology" *Advances in Clinical Pathology*, vol. 1, n. 2, 81-82, 1997
41. F. Spotorno, L. Piccinini, G. Tassara, C. Ruggiero, M. Nardini, F. Molina, M. Rocco, "BEAMS (BEAds Modelling System): A set of computer programs for the generation, the visualization and the computation of the hydrodynamic and conformational properties of bead models of proteins" *European Biophysics Journal*, *European Biophysics Journal*, vol. 25, 373-384, 1997
42. C. Ruggiero, M. Giacomini, R. Sacile, "The EPIC project in Savona: an example of dissemination of an EU-AIM project at Municipal level", *Medical Informatics*, vol. 22, n. 2, 143-154, 1997
43. M. Giacomini, C. Ruggiero, S. Bertone, L. Calegari, "Artificial neural network identification of heterotrophic marine bacteria based on their fatty acid composition", *IEEE Transactions on Biomedical Engineering*, vol. 44, n. 12, 1185-1191, 1997
44. C. Ruggiero, "Teleradiology: a review" *Journal of Telemedicine and Telecare*, vol. 4, 25-35, 1998
45. C. Ruggiero, "A Teleradiology primer" *Telemedicine Today*, vol. 6, n. 6, 36-42, 1998
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