

Angela Corcelli

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As chemistry student, Angela Corcelli developed a strong interest in life sciences, leading her to include Biochemistry, Molecular Biology and Physiology courses in the curriculum of studies. Her physiology professor Carlo Storelli invited her to work in his research group starting from 1977 and introduced her in the field of membrane transport. She is associate professor of Physiology at the University of Bari since 1987, with more than 30 years of research experiences in the field of membrane biology and cellular physiology. After studying the transport of sugars, amino acids and ions in membranes isolated from epithelial cells she moved in the field of cellular physiology of prokaryotes. She has investigated novel biochemical aspects of the archaeal photoactivated proton pump bacteriorhodopsin (an ancestor of animal eye rhodopsin) with particular interest in the lipid-protein interactions. She discovered the structures of the archaeal analogs of cardiolipins, associated to bacteriorhodopsin and playing a role in the bioenergetics of ancient archaeal microorganisms. Soon after she elucidated the structures of novel sulfonolipids of halophilic bacteria, sharing structural similarities with compounds of fungal origin inhibiting the serine palmitoyl transferase and with the capnines, known as antagonist of Willebrandt factor. Her studies on prokaryotic cardiolipins have shown that the levels of cardiolipins in membrane change in response to osmotic stress. Being interested in lipidomics, she has exploited the potentiality of mass spectrometry in the study of membrane lipids developing methods to directly analyze lipids in isolated membranes avoiding the steps of isolation and chromatographic separation by means of MALDI-TOF/MS. Lipid studies of Angela Corcelli have also contributed to the knowledge of structure of membranes containing olfactory receptors. She is presently involved in the study of dynamics and the functional role of cardiolipin as key lipid of mitochondria in health and disease.

Personal Data

Born on May 9, 1953 in Bari, Italy. Italian citizen.

Education

1971/1977 Chemistry studies, Bari University.
January 19th 1977, degree in Chemistry (laurea).

Position held

- 1977/1981 Assistant Professor of Physiology, Institute of General Physiology Bari University.
- 1981/1987 Researcher, Institute of General Physiology, Bari University.
- 1987-present Associate Professor of Physiology, Faculty of Sciences

Experience

- 1980, Laboratory of dr. Heini Murer, Max Planck Institute, Frankfurt (FDR).
- 1982, School of immunological and biochemistry techniques. Trieste University (Italy).
- 1983, September/December Laboratorium fur Biochemie, Professor G. Semenza. ETH Zurich (CH).
- 1987/1988, Sabbatical year National Institutes of Health, Bethesda (Md, USA), laboratory of dr. R. J. Turner (NIDR).

- 1992, Visit to the laboratory of prof. Janos K. Lanyi, University of California, Irvine., USA
- 1996, July/September MIT, Cambridge (Usa), laboratory of Gobind Khorana.
- 1997, Visit to the Wayne State University, Detroit (Mi, Usa), laboratory of Dr Richard Needleman.
- 1998, November, Ottawa University, Ottawa, Canada, laboratory of Dr Morris Kates.
- 2004, June, Columbia University, New York City, USA, laboratory of Dr. Stuart Firestein
- 2008, August, Rockefeller University, New York City, USA, studies on cardiolipin in collaboration with Tom Haines
- 2012, Sabbatical year. From January 25 to March 15 University of Helsinki, Biocenter 2, laboratory of Dennis Bamford to study cardiolipin of viruses. From April 9 to June 4 New York University-Langone Medical Center. Study on mitochondrial cardiolipin.

Research interest

- Membrane biology.
- Solubilization and reconstitution studies.
- Photoreceptors and lipids of halophilic Archaea
- Olfactory receptors.
- Biosensors.
- Role of lipid-protein interactions in membrane functions.
- Lipidomics as tool for the diagnosis and research in rare diseases.
- Functional role of cardiolipin in bacterial and mitochondrial membranes.

Funds, Principal investigators of the following Projects

- 2003 “ Costruzione di un naso bioelettronico per rivelare le mine antipersona.” Italian Minister of Defense (n. 685 di rep. del 18.12.2003; A.A. n. 841 di rep. del 22.06.2006)
- 2005-2006 “La batteriorodopsina come molecola prototipo per la costruzione di circuiti bioelettronici”. Italian Minister of Defence (n. 9199 di rep. del 13.12.2005)
- 2005 Fondazione Banca Carime Puglia: Investigations on olfactory receptors.
- 2010 Regione Puglia, Reti di laboratorio. Lipidomics unit in the project SENS&MICRO
- 2011 AROMA, Assemblaggio Recettori Olfattivi in Membrane Lipidiche Artificiali (Assembling of Olfactory Receptors in Artificial Membranes). Italian Minister of Defence (n. 1353 di rep., del 28/12/2010)
- 2013 Barth Foundation Grant USA

<http://www.barthysndrome.org/english/View.asp?x=1648>

Determination of monolysocardiolipin/cardiolipin ratio in intact nucleated blood cells: a new tool for the screening of Barth Syndrome

Tutor of the following PhD theses

- 1997-1999, dr Francesco Lopez (PhD in Chemistry). Role of lipid-protein interactions in the mechanism of ion translocation in biomembranes: the model of the bacteriorhodopsin, a photoactivated proton pump.
- 2000-2002, dr Veronica Lattanzio. Coupling of mass spectrometry and nuclear magnetic resonance in the study of biomembranes and biomasses

- 2001-2003 dr Patrizia Lopalco. Osmotic shock induces an increase of cardiolipin levels in archeal microorganisms
- 2004-2006 dr Matilde Sublimi Saponetti. Localization and functions of cardiolipins in extreme halophilic microorganisms
- 2005-2007 dr Andrea Ventrella (PhD in Chemistry). Photosynthetic membranes and proteins: studies on the factors influencing structural organization and functionality, towards biotechnological applications
- 2007-2009 dr Francesco Polidoro. Structure of archaeal lipid matrices and their use in reconstitution studies
- 2009-2011 dr Maristella Baronio. Lipidomics as integrated system to study membranes of prokaryotes and eukaryotes
- 2011-2013 dr Roberto Angelini. Lipidomics as tool in cellular physiology.
- 2013- Paola Tanzarella, Lipidomics studies in Parkinson disease

Courses

From 1977 to now she has taught General physiology, Comparative physiology, Animal physiology to students of Biology. From academic year 2013-2014 she also teaches Human Physiology to students of the college of Medicine.

Meeting organization

"Cardiolipin as key lipid of Mitochondria in Health and Disease" in collaboration with Michael Schlame, New York University

(<http://www.eurofedlipid.org/meetings/index.php>).

Meeting was held in Bari, September 17, 2013 as satellite of ICBL (International Conference on Bioscience of lipids).

Referee for FEBS, BBA, Photochemistry and Photobiology, Extremophiles, J Mass Spectrometry, J Chromatography, Chemical Science, Archaea, Journal Chemical Physics of Lipids

Editorial work

Lead Guest Editor of Archaea Journal Special issue: Lipid Biology of Archaea, 2012

Scientific video

Ecosistema saline. Museo Cittadino Cittadella della Scienza.

http://www.youtube.com/watch?v=0rv_fHK933w

Scientific exhibit "Dal mare al sale" (from sea to salt) by Cittadella Mediterranea della Scienza. Bari

Scientific exhibit "Scrivere con la luce" (write with light i.e. exploiting the properties of bacteriorhodopsin) by Cittadella Mediterranea della Scienza. Bari and Festival della Scienza, Genova 2007

Lipid structures discovered in the lab of Angela Corcelli are available at the following lipid data bases links

<http://www.lipidmaps.org/data/LMSDRecord.php?LMID=LMGL05030001>

<http://www.lipidmaps.org/data/LMSDRecord.php?LMID=LMGL05030007>

<http://www.cyberlipid.org>
<http://lipidlibrary.aocs.org>