

PERSONAL INFORMATION

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CURRENT POSITION

Debora is Full Professor of Physical Chemistry at the Department of Chemistry "Ugo Schiff" (DICUS, University of Florence, which ranked first among the 11 Departments of Excellence for Chemistry in Italy). She is member of the Italian Center for Colloid and Surface Science (CSGI).

RESEARCH SUMMARY

Debora leads the BioSoftMatter group, currently composed of one assistant Professor, 5 post-doc and 5 PhD students. Debora's work focuses on Soft Matter systems, from design to applications in several areas, mainly in biologically relevant fields. This area is more and more central in modern chemical sciences, representing a crossroad between disciplines traditionally separated in the past decades. The methodological approach of Soft-matter chemistry and physics can be directly exported to NanoBioscience, providing a new perspective on phenomena such as cell internalization, drug delivery and interactions with engineered nanosystems. Throughout her career, Debora has pioneered the application of radiation scattering methods, such as small angle scattering and reflectivity, to characterize the structural details of self-assemblies with biological relevance. Her research topics include hybrid nano and micro particle/lipid assemblies for responsive drug delivery, interaction of nanostructured assemblies with model membranes, design and application of nanostructured fluids

AWARDS

1999: "Young Scientists Award" from European Neutron Scattering Association

2002: Her research work on nucleolipids granted the Rhodia Prize 2002 (from the European Colloid and Interface Society) see <http://www.ecis.at/#Rhodia>.

SUPERVISION OF GRADUATE STUDENTS AND POST-DOC FELLOWS

She supervised more than 40 MS or BS thesis works, 12 PhD students and about 10 post-Docs. Her role in fostering career development, both in the academy and in the private sector, has been particularly successful with young women scientists.

CURRENT TEACHING ACTIVITIES

2019-now: Soft Matter Materials (English MsC in Advanced Molecular Sciences).

2006-now: Physical Chemistry of Nanosystems (Chemistry, MS)

2015-now: Physical Chemistry II with Laboratory (Chemistry, BS)

INSTITUTIONAL RESPONSIBILITIES

2021-now Vice Chancellor for Research, University of Florence

2000-now: Faculty member, University of Florence, Chemistry Department

2018-2021: Coordinator of the "Monitoring centre for Research", University of Florence

2020-now: Member of the "Commissione Didattica Paritetica", Chemistry Department

2010-2014: Member of the PhD Board at the Department of Chemistry, University of Florence

SERVICES AND EDITORIAL RESPONSIBILITIES

2020-now: Member of the Scientific Advisory Board of the Swedish Competence Center SweDeliver (The Swedish Drug Delivery Center)

2019-now: Member of the Editorial Board: JCIS open (Elsevier), Advances in Colloid and Interface Science (Elsevier)

2018-now: Member of the Ownership Board of the journal Physical Chemistry Chemical Physics, (Royal Society of Chemistry)

2018-now: Local coordinator of University of Florence - University of Sydney agreement
2018-now: Local coordinator of the agreement between the University of Florence and Monash University (Melbourne, Australia)
2017-now: **Co-Editor** of the Journal of Colloid and Interface Science (Elsevier)
2017-now: Member of the Elettra Proposal Review Panel for the SAXS beamline
2015-now: External Grant Reviewer of Swiss National Science Foundation, Israel Science Foundation, Romanian Science Foundation, ERC
2000-now: Reviewer for many ISI journals in the field of colloid science, soft matter, nanotechnology, nanomedicine
2015-2020: Member of the Soft Matter committee of the HZB-Berlin scientific panel
2020: External Reviewer for Full Professor Position, Sydney University, Australia
2018: member of the Review Panel of the Partnership for Soft Condensed Matter, ILL-ESRF, Grenoble
2013-2015: **President** of the European Colloid and Interface Society

External referee or member for PhD defense committees at several Universities (Roma I, Perugia, Brescia, Padova, Politecnico di Milano, Napoli, Catania, Genova). Abroad, she has been Jury member in Sweden (Uppsala, Gothenburg), France (Strasbourg, Grenoble, Toulouse) and Australia (Newcastle).

Transfer of Knowledge and Technology

Academic PI of several industry-related projects. Currently, she is supervising three post-doc students on grants funded by Procter and Gamble (budget 200KEuro/year)

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

Member of the Italian Chemical Society - Physical Chemistry Division
Vice President of the Regional Board of the Italian Chemical Society (since 2016)
Member of the American Chemical Society
Member of the Italian Society for Neutron Scattering and of its executive board (2016-2019)
Member of the European Neutron Society Association
Member of the European Colloid and Interface Society
Member of CSGI since its foundation in 1993

FUNDING

1999 PI of "Binding and Ion Specificity in amphiphilic assemblies of biological Interest", funding from University of Florence for Young Researchers
2001-2003 Researcher PRIN 2001 "Structure and Dynamics of Systems with extended interfaces and mesoporous", Italian Ministry of Research and Education (MIUR)
2003-2005 Researcher PRIN 2003, "Structure and Dynamics of Hard and Soft Nanosystems", MIUR
2007-2009 Researcher PRIN 2006 "Nucleolipid Assemblies: effects of aggregation and molecular recognition on microstructure", MIUR
2005-2007 Scientist in Charge for CSGI for "Addressable Molecular Node Assembly", STREP (Specific Targeted Research Project) (FP6, area "Nano-technologies and nanosciences- Self-organization and self-assembling") contractt 013575
2007-2008 National Coordinator of one Strategic Projects of FUSINT (Joint Research Project CNR and CSGI)
2009-2011 Vice-coordinator of PRIN "Functional Self-Assembled Nanosystems"
2013-2017 Unit leader EU-IAPP DNA-TRAP (FP7 2013-2017)
2014-2015 PI of Interaction of Engineered Nanoparticles with model lipid bilayer (ECRF)
2013-2016 National coordinator of PRIN 2010-2011 "Soft Matter Nanostrutturata: dall'indagine chimico-fisica allo sviluppo di applicazioni innovative"
2017-2019 PI of ECRF "Nanoparticles interacting with organized Soft Matter"
2018-2021 Marie Curie, European Industrial Doctorate, SAMCAPS
2018-2021 Contact Coordinator of the "FET-Open EVFoundry" for the CSGI unit
2020-2021 PI of "Engineering Hybrid Soft Matter Assemblies" (ECRF)

2020-2024 Contact Coordinator of the “FET-Proactive BOW” for the CSGI unit

PUBLICATIONS

Co-author of more than 150 papers published in international peer-reviewed scientific journals, 4 chapters in books, and one book. (h-index 31, 2959 tot. citations, source Scopus)

MAJOR SCIENTIFIC CONTRIBUTIONS

First Experimental Evidence of Molecular recognition contributions in the complexation of nucleic acids operated by negatively charged nucleolipid micellar assemblies, *Angew. Chem. Int. Ed.*, 2007, 46, 3070*

First evidence Complexation of single-stranded nucleic acids into nucleolipid lamellar phases, *J. Am. Chem. Soc.*, 2007, 129, 11664*

Design, preparation and physico-chemical investigation of phospholipid membranes decorated by cholesterol-based oligonucleotides as soft hybrid nanostructures, *J. Phys.Chem. B*, 2008, 112, 35, 10942*

Insights into the receptor-independent modulation of reconstituted Gi protein in liposomes, *Mol. Biosyst.*, 2009, 5, 301, journal cover*

Visualization of magnetically triggered Release from Giant Unilamellar Vesicles: decorated with magnetic nanoparticles, *J. Phys. Chem. Letters*, 2011, 2, 713

Design, characterization and proof-of-principle of a novel nanostructured formulation to remove acrylic coatings from frescoes and some insights on possible mechanisms on the nanoscale, *Nanoscale*, 2012, 4, 42

Understanding the mechanistic aspects of the interaction of inorganic nanoparticles with nanostructured lipid assemblies, *Nanoscale*, 2014, 6, 6452*

First insights into Interaction of lipoplexes with model membranes, *Soft Matter*, 2014,10, 39, Cover Feature, January Hot Paper *

First insights into the role of the bacterial lipid cardiolipin in the action of novel antimicrobial nanoplexes in model bacterial membranes, *Scientific Reports*, 2017, 7, 41242*

First evidence of the thermotropic and magnetotropic phase behaviour of lipid liquid crystals containing magnetic nanoparticles, *Nanoscale*, 2018,10, 3480*, selected to be a part of a themed collection International Year of the Periodic Table: As attractive as magnets – applications for magnetic materials.

First hypotheses on the mechanism of Polymer Film Dewetting by Water/Surfactant/Good-Solvent Mixtures and its implications for the Conservation of Cultural Heritage, *Angew. Chem. Int. Ed.* 2018,57, 7355*

Design of microemulsions confined in hydrogels for efficient removal of adhesive tapes from paper artworks, *Proc. Natl. Acad. Sci. USA*, 2018, 115, 5932

DB was selected as leader in the field to write her personal perspectives about “Nanoparticles and organized lipid assemblies: from interaction to design of hybrid soft devices” on the occasion of *Soft Matter*'s 15 th Anniversary (*Soft Matter*, 2019,15, 8951)*

* senior author

INVITED PRESENTATIONS TO INTERNATIONAL CONFERENCES AND SEMINARS

More than 100 oral communications as a speaker and more than 25 invited talks at international conferences.

From 2015, she delivered 5 invited plenary lectures and 8 invited keynote lectures at International Conferences and Workshops and about 10 seminars at other foreign universities or research centres and abroad (e.g. UK, France, Australia)