

## **Summary:**

Debora Berti is Full Professor of Physical Chemistry at the Department of Chemistry of the University of Florence and member of the Italian Consortium for Colloid and Surface Science. She teaches Applied Thermodynamics (BSc Chemistry) and Physical Chemistry of Nanosystems (MsC in Chemical Sciences).

Debora's scientific background is Physical Chemistry of Soft Matter. 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 for the conservation of cultural heritage. Debora Berti has been national coordinator of the Research Program "Nanostructured Soft Matter: from Fundamental Research to Novel Applications, local coordinator of the EU-IAPP DNA-TRAP (2013-2017) and currently CSGI-FI contact coordinator for the FET-OPEN EVFoundry (project coordinator) and key staff for CSGI-FI

Debora Berti has a well-established track record of her work, with more than 120 authored or co-authored research papers and several chapters contributed in specialized books.

She is co-Editor of the Journal of Colloid and Interface Science and of Advances in Colloid and Interface Science (Elsevier), member of the Ownership Board of the journal Physical Chemistry Chemical Physics, (Royal Society of Chemistry), member of the Review Panel of the Partnership for Soft Condensed Matter (PSCM, ILL-ESRF), member of the Soft Matter committee of the scientific panel of HZB-Berlin and member of the Elettra Proposal Review Panel for the SAXS beamline She was the President of the European Colloid and Interface Society (2013-2015). She edited the book Colloidal Foundations of Nanoscience, published by Elsevier in 2014.

## **CURRENT POSITION**

**2016-** Full Professor of Physical Chemistry, University of Florence, Department of Chemistry Ugo Schiff"

## **PREVIOUS APPOINTMENTS**

**2014-2016:** Associate Professor of Physical Chemistry, University of Florence, Department of Chemistry Ugo Schiff"

**2000-2014:** Researcher (Physical Chemistry), University of Florence, Department of Chemistry

**1999-2000:** Post Doc at the Department of Chemistry, University of Florence

**1997-1999:** Post Doc at CSGI (Italian Center for Colloids and Nanoscience)

**1994-1997:** PhD student at the Department of Chemistry (Florence), funded by ENEA, (National Agency for New Technologies, Energy and Sustainable Development);

**1993:** CNR (National Research Council) fellowship, "Langmuir-Blodgett Membranes" at the Department of Chemistry, University of Florence

## **AWARDS AND PRIZES**

**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>.

## **AFFILIATIONS**

Member of the Italian Chemical Society (Physical Chemistry Division); Vice President of the Regional Board of the Italian Chemical Society (2016-)

Member of the American Chemical Society

Member of the Italian Society for Neutron Scattering and member of its executive board (2016-present)

Member of the European Neutron Society Association

Member of the European Colloid and Interface Society

Member of CSGI (Italian Center for Colloids and Nanoscience) since its foundation in 1993

## **TEACHING & TRANSFER OF KNOWLEDGE**

### **Academic Courses**

**2006-present:** Physical Chemistry of Nanosystems (Chemistry, MS)

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

**2005-2008:** Molecular Principles of Biomaterials (Molecular Biotechnology, MS)

**2002-2005:** Physical Chemistry Laboratory (for Biotechnology, BS)

**2003-2006:** Scattering Methods for Biology (for Biology Students, MS)

### **Student Mentoring and Supervising**

She has been supervisor of more than 20 MS or BS thesis work and supervised 8 PhD students.

## **MAIN PARTICIPATIONS TO FUNDED RESEARCH PROJECTS**

**1999 PI:** "Binding and Ion Specificity in amphiphilic assemblies of biological Interest", funding from University of Florence for Young Researchers

**2001-2003:** Researcher (11 m/m) in PRIN 2001 "Structure and Dynamics of Systems with extended interfaces and mesoporous" (Italian Ministry of Research and Education, MIUR)

**2003-2005:** Researcher (8 m/m) PRIN 2003, "Structure and Dynamics of Hard and Soft Nanosystems" (MIUR)

**2007-2009:** Researcher (7 m/m) PRIN 2006 "Nucleolipid Assemblies: effects of aggregation and molecular recognition on microstructure" (MIUR)

**2005-2007:** Scientist in Charge for the CSGI Research Unit CSGI for AMNA (Addressable Molecular Node Assembly), STREP (Specific Targeted Research Project) (FP6, area "Nano-technologies and nanosciences- Self-organization and self-assembling") Contratto 013575

**2007-2008:** FUSINT (Joint Research Project CNR and CSGI) National Coordinator of one of the two Strategic Projects)

**2009-2011:** Vice-coordinator of "Functional Self-Assembled Nanosystems" PRIN 2008, (20087K9)

2013-2017: EU-IAPP DNA-TRAP (FP7 2013-2017) (48 months, team leader CSGI unit, leader Work Package 3)

**2014-2015:** ECRF; *Interaction of Engineered Nanoparticles with model lipid bilayer* (18 months; PI)

**2013-2016:** PRIN 2010-2011 Soft Matter Nanostrutturata: dall'indagine chimico-fisica allo sviluppo di applicazioni innovative (36 months, national coordinator)

**2017-2019:** ECRF “Nanoparticles interacting with organized Soft Matter” (18 months, PI)

**2018-2021:** Contact Coordinator of the “FET-Open EVFoundry” for the CSGI unit (project coordinator, Grant agreement in preparation as of 22<sup>nd</sup> February 2018)

### **SCIENTIFIC TRACKS AND RESEARCH INTERESTS**

The research interests of DB focus essentially on the Physical Chemistry of Soft Matter, with particular attention to complex fluids with biological relevance. This field of research is becoming more and more central in modern chemical sciences, as it represents a true crossroad between disciplines, traditionally separated in the past decades. This distinctive feature, that descends from the inherent multidisciplinary nature that has always characterized Colloid Science, is currently acquiring a new significance, in view of the different and complementary skills that nowadays contribute to this field, from physics, to chemistry, to biology. Interestingly, the methodological approach of Soft-matter chemistry and physics and some of its relevant scientific concepts can be directly exported to NanoBioscience, providing a new perspective on phenomena as diverse as cell internalization, protein and peptide fibrillization, protein-ligand interactions.

### **PUBLICATION DATA AND BIBLIOMETRIC INDEXES**

DB is author or co-author of more than 120 peer-reviewed publications. The updated publication list is accessible on-line: <http://www.researcherid.com/rid/G-6525-2011>

### **MAJOR SCIENTIFIC CONTRIBUTIONS (WITH COLLABORATORS & CO-WORKERS)**

- First experimental structural characterization of polymer-like phases of nucleolipids through correlation of Neutron Small angle and Static Light Scattering. The complete scattering pattern has been analyzed through an innovative approach. [Journal of Physical Chemistry B 108, 2004, 16427-16434]
- 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, 3070–3073]\*
- First evidence Complexation of single-stranded nucleic acids into nucleolipid lamellar phases [J. Am. Chem. Soc., 2007, 129, 11664-11665]\*
- 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, 10942–10952]\*
- Insights into the receptor-independent modulation of reconstituted Gi protein in liposomes [Mol. Biosyst., 2009, 5, 301 - 302, journal cover]\*
- Visualization of magnetically triggered Release from Giant Unilamellar Vesicles: decorated with magnetic nanoparticles [J. Phys. Chem. Letters, 2011, 2, 713-718.]

- A novel nanostructured formulation to remove acrylic coatings from frescoes and some insights on possible mechanisms on the nanoscale, [Nanoscale, 2012, 4, 42-53 DOI: 10.1039/c1nr10911a]
- Understanding the mechanistic aspects of the interaction of inorganic nanoparticles with nanostructured lipid assemblies [Nanoscale, 2014, 6 (12), 6452 - 6457]\*
- Interaction of lipoplexes with model membranes [Soft Matter, 2014,10, 39-43; Cover Feature, January Hot Paper, <http://blogs.rsc.org/sm/2014/01/10/january-hot-papers.>] \*

\* DB is first author or senior author