

## CV Roberta Cavalli

Roberta Cavalli, Full Professor of Pharmaceutical Technology, Dipartimento di Scienza e Tecnologia del Farmaco - Università degli Studi di Torino.

### *a) Curriculum Vitae*

- 1985**: MD degree in Pharmaceutical Chemistry, (University of Turin, Italy)
- 1986**: MD degree in Pharmacy, (University of Turin, Italy)
- 1993**: PhD degree (University of Turin, Italy)
- 1993-96**: Post-doc position, University of Turin (Italy)
- 1997-99**: Research assistant, University of Turin (Italy)
- 1999-2002**: Assistant professor of Pharmaceutical Technology, University of Turin (Italy)
- 2002-2014**: Associate professor of Pharmaceutical Technology, University of Turin (Italy)
- 2015-today**: Full professor of Pharmaceutical Technology, University of Turin (Italy)

### *b) Teaching*

- Pharmaceutical Technology
- Design and Formulation of Biotech Medicinal Products
- Design and Development of Topical and Dermatological Products
- Innovative Drug Delivery Systems (PhD Student course)
- Pharmaceutical Technology II (Hospital Pharmacy degree course)

### *.c) Research activity*

Roberta Cavalli have a multi-year experience in the design and development of either conventional pharmaceutical formulations or nanotechnology-based drug delivery systems, as well as their *in vitro* and *in vivo* characterization.

Much research focused the attention on developing novel nanoparticulate formulations to improve the efficacy of the loaded therapeutic molecules. RC developed various types of novel nanocarriers consisting of safe components, generally either polymers or lipids, admitted by the regulatory authorities to assure biocompatibility, biodegradability and low cytotoxicity.

A number of studies concerned the fine tuning of nanostructured systems for low soluble drugs to increase their solubility, improve their bioavailability, modify their pharmacokinetics parameters and their biodistribution.

The research of RC payed a great attention on cyclodextrin derivatives and cyclodextrin-based nanocarriers. Among them, nanosponges, polymer nanoparticles obtained by the cross-linking of cyclodextrins with different cross-linking agents, have been deeply studied. The cross-linking of cyclodextrin units produced a nanoporous solid nanostructure consisting on cyclodextrin cavities and nanochannels due to the cross-linking network. As a consequence, it is possible to include various compounds. A number of nanosponge formulations have been obtained for the delivery of different types of lipophilic and hydrophilic molecules (anticancer drugs, antivirals, antioxidants), gases and macromolecules. New cyclodextrin derivatives have been also designed for siRNA delivery.

Another field of RC research involved the studies of new biocompatible polymer nanosystems for the delivery of nucleic acids, such as DNA, oligonucleotides and siRNAs. In particular, novel self-assembled nanocarriers were tuned to protect them from degradation and to improve the intracellular release of nucleic acids improving their effectiveness.

More recently, her interest moved to the design of novel polymer/lipid hybrid nanobubbles and nanodroplets, core-shell nanostructure filled with a gas or a liquid respectively. Nanobubbles can be loaded with gases, small molecules and macromolecules due to their unique architecture. The surface conjugation with specific ligands (i.e. antibodies) have been exploited for active targeting to specific cells or tissues.

These types of nanocarriers can be used as such or combined with an external stimulus, such as ultrasound for targeted drug release.

Different technological approaches have been studied to associate macromolecules (i.e. proteins or nucleic acids) within the bubble structures. The association with nanobubbles improved the stability and the transfection efficiency of DNA and miRNA.

Interestingly, theranostic nanobubbles have been developed for improving the cure of cancer or other important diseases. Finally, targeted nanobubbles to dendritic cells have been successfully designed for cancer vaccination either to treat existing cancer or prevent development of a cancer

RC played the role of Principal Investigator of a number of private and public multidisciplinary projects.. She is used to work with colleagues with complementary expertise and knowledge to go beyond existing approaches. Many international papers, congress communications and patents evidenced the RC pharmaceutical technology and nanoformulation expertise.

Co-author of more than 200 full papers in peer-reviewed international journals with impact factor and more than 30 patents. Overall citations > 7500, *H* index 49 ([www.scopus.com](http://www.scopus.com)).

### *d) Memberships*

Member of the Italian Association of Pharmaceutical Technology Researchers (ADRITELF), the Italian Association of Industrial Pharmacists (AFI), the Controlled Release Society (CRS), the Italy chapter CRS, the American Association of Pharmaceutical Scientists (AAPS), the European Society for Molecular Imaging (ESMI) and the Italian Association of Cyclodextrins