



Curriculum Vitae Europass

PERSONAL INFORMATION

Name

LUISA FIANDRA

E-mail

luisa.fiandra@unimib.it,

Nationality

Italian

Date of birth

01.08.1973

PhD

2003 (University of Milan, Department of Biology)

WORKING EXPERIENCE

- Dates (from-to)
- Position and working address
- Main responsibilities

November 2023-present

Associate Professor in Clinical Biochemistry (BIO12) - Department of Biotechnology and Biosciences, University of Milano Bicocca (UNIMIB), Italy.

Teaching activity for the Bachelor's Degrees in Biotechnologies and Biological Sciences, and the Masters Degrees in Industrial Biotechnology and Biology.

Research activity on: biomolecular characterization of tumor progression and validation of nanoformulated biomedical drugs and cosmeceutical using advanced 3D cell systems; collaborator of NanoBioLab (<http://www.nanobiolab.btbs.unimib.it>).

- Dates (from-to)
- Position and working address
- Main responsibilities

November 2020 -October 2023

Researcher and Assistant Professor (RTDB) in Clinical Biochemistry (BIO12) - Department of Biotechnology and Biosciences, University of Milano Bicocca (UNIMIB), Italy.

Research activity on: biomolecular characterization of tumor progression, validation of nanoformulated biomedical drugs and cosmeceutical, safe-by-design of nanodrugs, using advanced 3D cell systems; study of biomarkers of viral diseases.

- Dates (from-to)
- Position and working address
- Main responsibilities

June 2018 -October 2020

Researcher and Assistant Professor (RTDA) in Cytology and Comparative Anatomy - Department of Earth and Environmental Sciences, University of Milano Bicocca (UNIMIB), Italy

Research activity in Nanotoxicology and safe-by-design of nanodrugs on advanced 3D cell systems; responsible of part of the *in vitro* and *in vivo* research activity for the development of innovative nano-drug of NanoBioLab (UNIMIB).

- Dates (from-to)
- Position and working address
- Main responsibilities

February 2017 –May 2018

Lab Manager - Department of Biotechnology and Biosciences – UNIMIB, Italy

Manager of NanoBioLab; responsible of part of the *in vitro/ex vivo* and *in vivo* research activity of NanoBioLab and of the Nanomedicine Unit of “L. Sacco” University Hospital.

- Dates (from-to)
- Position and working address
- Main responsibilities

August 2015 –January 2017

Senior post-doc associate. Nanomedicine Unit, Department of Biomedical and Clinical Sciences “L. Sacco”, University of Milan (UNIMI), Italy.

Research activity in Nanomedicine: biological validation of new nanodrugs for breast cancer theranostics and brain disease targeting; co-responsible of the Nanomedicine Unit platform for *in vitro/ex vivo* (Confocal Microscopy) and *in vivo* (IVIS Optical system) Imaging.

- Dates (from-to)
- Position and working address
- Main responsibilities

- Dates (from-to)
- Working address

RESEARCH ACTIVITY

April 2010 –August 2015

Senior researcher. “L. Sacco” Hospital, Milan, Italy.

Research activity in Nanomedicine and scientific coordination of the project “Development of novel nanostructured materials for the diagnosis of breast cancer, inflammatory bowel disease (IBD) and modulation of antiretroviral therapy (HAART) in HIV” (NanoMeDia) financed by “Assessorato alla Sanità”, Regione Lombardia; co-responsible for *in vitro/ex vivo* (Confocal Microscopy) and *in vivo* (IVIS Optical system) Imaging

November 2003- April 2010

Department of Biology- UNIMI, Milano.

Up to 2010, LF dealt with transport and cell physiology at the Department of Biology of the University of Milan, to detect the interaction of molecules with membrane receptors, their intracellular uptake and their ability to cross intact epithelia by *ex vivo* assays.

From 2010 to 2017, LF was responsible of the preclinical studies of the Nanomedicine Unit of “L. Sacco” University Hospital, where she coordinated research activity mainly devoted to the use of nanotechnology for cancer therapy and diagnosis, and for biological barriers overcoming. In particular, LF played the role of scientific coordinator of the national project “Development of novel nanostructured materials for the diagnosis of breast cancer, inflammatory bowel disease (IBD) and modulation of antiretroviral therapy (HAART) in HIV”. In close collaboration with the Anatomy Pathology Unit of the hospital and with the Pharmacology Unit of the department of Biomedical Sciences “L. Sacco” of University of Milan, LF designed and supervised *in vitro* and *in vivo* experiments aimed to assess:

- 1) interaction, internalization and trafficking of biologically active molecules and nanodrugs in cells and animal tissues,
- 2) biological activity on target and non-target cells,
- 3) ability in crossing biological barriers (i.e., BBB) *in vitro* and *in vivo*,
- 4) biodistribution, pharmacokinetic properties, therapeutic effect, and acute and sub-acute toxicity in murine models.

As reported in publications reported below, LF main targets of interest were: breast cancer (diagnosis and therapy of primary tumor and metastases); Blood brain barrier overcoming for CNS disease targeting; HIV-eradication from sanctuaries; anti-diabetic oral nanoformulation of insulin with colonic release.

From February 2017, LF played the role of manager of the NanoBioLab, and supervisor for projects dealing with the design and pre-clinical validation of newly formulated nanodrugs for oncology, neurological diseases and autoimmune diseases. In the meantime, LF continued the activity of Scientific consultant for the *in vitro* and *in vivo* pre-clinical assays of the NanoBioLab and of Nanomedicine Unit of “L. Sacco” University Hospital.

More recently, LF as member of Centre POLARIS (Particular Matter and Health Risk) and of the Nanotoxicology Laboratory of UNIMIB, she has been involved in the evaluation of the human safety of pharmaceutical and manufacturing nanoproducts.

From November 2020 to October 2023, as RTDB of the BtBs, on the project CHRONOS - CHRONical multifactorial disorders explored by NOvel integrated Strategies, she has been involved in various projects involving the development of advanced cellular models for the validation of conventional or latest generation drugs directed towards tumor or neurodegenerative pathologies; use of advanced cellular models for the characterization of tumor model complexity and the validation of conventional or latest generation therapies directed towards tumor pathologies.

Since November 2023, LF has continued to develop advanced cellular models, aimed at the validation of innovative nano-drugs by the NanoBioLab (BtBs). Furthermore, he participates in a project aimed at the implementation of electronic microscopy systems, for the subcellular localization of nanoparticles of different nature for theranostic purposes

PROJECTS

- From **2018** - Participation with responsibility in the H2020 project - PROTECT-Pilot lines production of nanostructured and anti-adhesive textiles and medical devices based on novel coating technologies
- From **2019** - Responsible of the University project "Evaluation of the biocompatibility of different nanomaterials through standardized *in vitro* and *in vivo* toxicological assays"
- From **2019** - Participation with responsibility in the AIRC project - Development of a universal Fcy nano-antenna for triggering Natural Killer cell-mediated immunotherapy of cancer

- From **2020** - Responsible of the University project "Impact of new nanomaterials produced for antibacterial or antitumor purposes on biological systems: toxicological assessments in vitro and on developing vertebrates"
- From **April 2020** - Participation in the H2020 project - ASINA - Anticipating Safety Issues at the Design Stage of Nano Product Development
- From **April 2020** - Participation in the project -Study of the role of the SP-D protein in the SARS-CoV-2 coronavirus infection for the development of a therapeutic treatment model (SPeeD), funded by Cariplo.
- From **October 2020**, participation in the project - Determination of circulating SP-D levels in patients infected with the SARS-CoV-2 virus and evaluation of its prognostic value, in collaboration with the School of Medicine and Surgery of Unimib.
- From **2021** - participation in the H2020 European project "ULTRAFast ALL-OPTICAL SPATIO-TEMPORAL ELECTRON MODULATORS: OPENING NEW FRONTIERS IN ELECTRON MICROSCOPY" (H2020-FETOPEN-2018-2019-2020-01).
 - From **2022** - Participation in the AIRC project - Advanced Nanotechnology to Assist Keeping the tumor microenvironment Involved in cancer Neutralization (ANAKIN)
 - From **2023** - Participation in the PRIN-PNRR - Sema3A RNA nanodelivery to pancreatic ductal adenocarcinoma microenvironment for the activation of tumor immune response
 - From **2022** – PNRR projects; participation in CN3: National Center for Gene Therapy and Drugs based on RNA Technology - (Sviluppo di terapia genica e farmaci con tecnologia a RNA); participation in PE 6 - HEAL ITALIA HEALTH EXTENDED ALLIANCE FOR INNOVATIVE THERAPIES, ADVANCED LAB-RESEARCH, AND INTEGRATED APPROACHES OF PRECISION MEDICINE (Diagnostica e terapie innovative nella medicina di precisione)

TEACHING ACTIVITIES

- **From 2024**, she holds the Laboratory of Biochemistry for the LIB (Degree in Biological Sciences, Unimib); she is one of the professor of the course of Genetic Diseases: from Diagnosis to Therapy (Master Degree in Biology, Unimib).
- **From 2023**, she holds the Laboratory of Advanced Cellular Models in Pre-Clinical Research and Personalized Medicine (Degree Course in Industrial Biotechnology, Unimib).
- **From 2021**, she holds the Laboratory of Biochemistry for the LTA (Degree in Biotechnology, Unimib).
- **2018-2020**: Assistant Professor in Cytology and Comparative Anatomy for the degree in Biological Sciences and in Environmental Science and Technology (Unimib)
- **2010-2019**:
 - specialization seminars on "Nanotechnology applied to Medicine" for the student of Medicine and Surgery of the University of Milan, Department of Biomedical and Clinical Science L. Sacco
 - specialization seminars for the students involved in a "Double Diploma" program between the Department of Biotechnology and Bioscience of the University of Milan Bicocca and the University of Paris 5
 - specialization seminars for the PhD students of Clinical and Experimental Pharmacology of Unimi.
 - specialization seminar for the European Master in Translational Cosmetic and Dermatological Sciences –University of Eastern Piedmont, Italy
- **2010-2018**: teaching assistant for the course of General Physiology - degree in Life Sciences (University of Milan, Italy)

HONORS AND MEMBERSHIPS

- Reviewer for: Journal of Controlled Release, ACS Nano, Nanomedicine: Nanotechnology, Biology, and Medicine, Nanomaterials, In vitro cellular and developmental Biology, International Journal of Molecular Sciences.
- 2015, conference chairing: 5th International Conference and Exhibition on Pharmaceutics & Novel Drug Delivery Systems. Dubai, 16-18 Marzo.
- 2016, member of the organizing committee for "8th International Conference and Exhibition on Pharmaceutics & Novel Drug Delivery Systems". Madrid, Spain, March 07-09.
- 2015-2016: member of "Controlled Release Society, Italian chapter".
- 2019, member of Organizing Committee and Chair of the symposium "Biosafety of Nanomaterials" for Nanoinnovation 2019 (Roma 11-14 Giugno).
- 2020-2021, Guest Editor for the Special Issue "Recent Research on Nanostructured Biomedicine: Clinical Potential and Safety", for the journal NANOMATERIALS.
- From 2021, Co-Editor of Current Pharmaceutical Biotechnology (Bentham Science)
- From 2021, Review Editor on the Editorial Board of Nanobiotechnology (specialty section of

Frontiers in Bioengineering and Biotechnology, Frontiers in Molecular Biosciences and Frontiers in Materia)

- Member of the Research Center POLARIS (Particular Matter and Health Risk) of Unimib.
- Member of the Italian Society of Clinical Biochemistry (SiBioC)
- Member of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM)
- Member of BioNanoMedicine Center "NANOMIB" of Unimib.
- Member of Centro 3R (Inter-University Center for the Promotion of the 3Rs Principles in Teaching & Research).
- From 2021, member of the board of PhD Course in Converging Technologies for Biomolecular Systems (TeCSBi). From 2022 is part of the Ministerial Board for TcCSBi.
- 2023, Women Researcher Award at the 14th Edition of International Research Awards on Oncology and Cancer Research (24-26 April 2023 London, United Kingdom). Title of the contribution: "The cross-talk between cancer-associated fibroblasts and metastatic breast cancer cells.
- In 2023, external referee for doctoral thesis in Doctoral School in Life and Health Sciences, PhD Program in Complex System for Life Sciences (University of Turin)
- In 2024, member of the competition commission for a position of fixed-term researcher of type A in the competition sector 05/E3 - Biochimica clinica e biologia molecolare clinica, (SSD BIO/12) at the University of Milano-Bicocca, Department of Biotechnology and Biosciences.
- In 2024, member of the commission for the final examination of the PhD in Translational Medicine (University of Milan).

PUBLICATIONS

Author of 49 publications in peer-reviewed international journals. Scopus H-index 20. Citations: 1489

Selection of most relevant publications:

- 1) di Miceli, N., Baioni, C., Barbieri, L..... **Fiandra, L.*** TGF- β Signaling Loop in Pancreatic Ductal Adenocarcinoma Activates Fibroblasts and Increases Tumor Cell Aggressiveness. *Cancers* 2024, 16(21), 3705.
- 2) Advanced Cell Culture Models Illuminate the Interplay between Mammary Tumor Cells and Activated Fibroblasts. Del Nero, M., Colombo, A., Garbujo, S., Colombo, M., **Fiandra, L.***. *Cancers*, 2023, 15(9), 2498.
- 3) Surfactant protein D (SP-D) as a biomarker of SARS-CoV-2 infection. Salvioni, L., Testa, F., Sulejmani, A., ...Colombo, M., **Fiandra, L.***. *Clinica Chimica Acta*, 2022, 537, pp. 140–145
- 4) Heparin–Superparamagnetic Iron Oxide Nanoparticles for Theranostic Applications. Massironi, N., Colombo, M., Cosentino, C., **L. Fiandra**,Vismara, E., Vlodavsky, I. *Molecules*, 2022, 27(20), 7116.;
- 5) Antibacterial, Antibiofilm, and Antiviral Farnesol-Containing Nanoparticles Prevent *Staphylococcus aureus* from Drug Resistance Development. Ivanova, A., Ivanova, K., **Fiandra, L.**, ...Jacobi, G., Tzanov, T. *International Journal of Molecular Sciences*, 2022, 23(14), 7527
- 6) Tullio, Chiara; Salvioni, Lucia; Bellini, Michela; Degrassi, Anna; **Fiandra, L.**; D'Arienzo, Massimiliano; Garbujo, Stefania; Rotem, Rany; Testa, Filippo; Prosperi, Davide; Colombo, Miriam. Development of an effective tumor-targeted contrast agent for Magnetic Resonance Imaging based on Mn/H-Ferritin nanocomplexes. *ACS Applied Bio Materials* 2021, 4, 11, 7800-7810.
- 7) Salvioni L, Morelli L, Ochoa E, Labra M, **Fiandra L**, Palugan L, Prosperi D, Colombo M. The emerging role of nanotechnology in skincare *Adv Colloid Interface Sci*, 2021, 293:102437.
- 8) Floris P, Garbujo S, Rolla G, Giustra M, Salvioni L, Catelani T, Colombo M, Mantecca P, **Fiandra L***. The Role of Polymeric Coatings for a Safe-by-Design Development of Biomedical Gold Nanoparticles Assessed in Zebrafish Embryo. *Nanomaterials (Basel)*,

2021, 11(4):1004.

- 9) Bellini M, Riva B, Tinelli V, Rizzuto MA, Salvioni L, Colombo M, Mingozi F, Visioli A, Marongiu L, Frascotti G, Christodoulou MS, Passarella D, Prospero D, **Fiandra L***. Engineered Ferritin Nanoparticles for the Bioluminescence Tracking of Nanodrug Delivery in Cancer. *Small* 2020, 28: e2001450.
- 10) Das P, Fatehbasharzarad P, Colombo M, **Fiandra L***, Prospero D. Multifunctional Magnetic Gold Nanomaterials for Cancer. *Trends Biotechnol.* 2019, 37(9), pp. 995-1010.
- 11) Colombo M, Rizzuto M, Pandolfi L, Pacini C, Bonizzi A, Truffi M, Monieri M, Catrambone, Francesco, **Fiandra L**, Corsi F, Prospero D, Mazzucchelli S. Half-Chain Cetuximab Nanoconjugates Allow Multitarget Therapy of Triple Negative Breast Cancer. *Bioconjugate Chemistry.* 2018, 29(11):3817-3832.
- 12) **Fiandra L**, Capetti A, Sorrentino L, Corsi F. Nanoformulated antiretrovirals for penetration of the central nervous system: state of the art. *J Neuroimmune Pharmacol.* 2017; 12(1): 17-30.
- 13) Mazzucchelli S, Bellini M, **Fiandra L**, Truffi M, Rizzuto MA, Sorrentino L, Longhi E, Nebuloni M, Prospero D, Corsi F. Nanometronomic treatment of 4T1 breast cancer with nanocaged doxorubicin prevents drug resistance and circumvents cardiotoxicity. *Oncotarget.* 2017; 8(5): 8383-8396.
- 14) Colombo M*, **Fiandra L***, Alessio G, Mazzucchelli S, Nebuloni M, De Palma C, Kantner K, Pelaz B, Corsi F, Parak WJ, Prospero D. Less Is More - How in Vivo Tumor Homing and Localization of Colloidal Nanoparticles Depends on the Number of Attached Antibodies. *Nature Communications, Nature Communications*, 2016; 7: 13818.
- 15) Salvioni L, **Fiandra L**, Del Curto M, Mazzucchelli S, Allevi R, Truffi M, Sorrentino L, Santini B, Cerea M, Plaughan L, Corsi F, Colombo M. Oral delivery of insulin via polyethylene imine-based nanoparticles for colonic release allows glycemic control in diabetic rats. *Pharmacological Research* 2016, 110: 122-130.
- 16) **Fiandra L**, Colombo M, Mazzucchelli S, Truffi, M, Santini B, Allevi R, Nebuloni M, Capetti A, Rizzardini G, Prospero D, Corsi F. Nanoformulation of antiretroviral drugs enhances their penetration across the blood brain barrier in mice. *Nanomedicine*, 2015; 11(6): 1387-1397.
- 17) Bellini M, Mazzucchelli S, Galbiati E, Sommaruga S, **Fiandra L**, Truffi M, Rizzuto MA, Colombo M, Tortora P, Corsi F, Prospero D. Protein nanocages for self-triggered nuclear delivery of DNA-targeted chemotherapeutics in Cancer Cells. *J Control Release*, 2014; 196: 184-96.
- 18) **Fiandra L**, Mazzucchelli S., De Palma C., Colombo M., Allevi R., Sommaruga S., Clementi E., Bellini M., Prospero D., Corsi F. Assessing the in vivo targeting efficiency of multifunctional nanoconstructs bearing antibody-derived ligands. *ACS Nano* 2013; 7: 6092-6102.
- 19) Corsi F*, **Fiandra L***, De Palma C., Colombo M., Mazzucchelli S., Verderio P., Allevi R., Tosoni A., Nebuloni M., Clementi E., Prospero D. HER2 Expression in Breast Cancer Cells Is Downregulated Upon Active Targeting by Antibody-Engineered Multifunctional Nanoparticles in Mice. *ACS Nano* 2011; 5: 6383-6393

(* corresponding author; *equally contributed)

Milan, 13-11-24

