PERSONAL INFORMATION

Barbara Vigani

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Sex: Female | *Date of birth:* 16/09/1989 | *Nationality:* Italian

WORK EXPERIENCE

May 2022 – current
Assistant professor SSD CHIM09 (Applied pharmaceutical chemistry and technology) at the Department of Drug Sciences of the University of Pavia, Italy.

2022 – current
Teaching to Industrial Nanobiotechnologies for Pharmaceuticals course "Nanotechnology-based medicine"

2020-2022
Teaching to Pharmacy master course "Special Pharmaceutical Technology", University of Pavia, Italy.
Teaching to Biotechnology master course "Nanomaterials and Pharmaceutical Applications", University of Pavia, Italy.

October 2021
A series of lectures on the topic "Rheological analysis as a tool to investigate polymer in situ gelling properties", for EMJMD Nanomed (European Master Joint Master Degree Nanomedicine for Drug Delivery).

2018-2022
A series of lectures on the topic "Challenges for the delivery of biologics: alternative administration routes" for EMJMD Nanomed (European Master Joint Master Degree Nanomedicine for Drug Delivery).

April 2017- April 2022
Postdoctoral fellow (supervised by Prof. Silvia Stefania Rossi) at the Biopharmaceutics and Formulation Development Lab, Department of Drug Sciences, University of Pavia, Italy.

EDUCATION AND TRAINING

February 2017
PhD degree in Chemical and Pharmaceutical Sciences, University of Pavia, Italy.
PhD Thesis Title: "Development of Advanced Therapy Medicinal Products for regenerative medicine" (supervised by Prof. Maria Luisa Torre) (EQF Level 8)

December 2013
Qualification to practice the profession of pharmacist, University of Pavia, Italy

July 2013
Degree cum laude in Pharmacy, University of Pavia, Italy.
Thesis Title: Platelet lysate-loaded sponge-like dressings containing sericin for the treatment of chronic skin ulcers (supervised by Prof. Silvia Stefania Rossi). (EQF Level 7)

June 2008
Scientific High School Diploma, Liceo scientifico "E. Amaldi", Alzano Lombardo, Bergamo, Italy.

WORK ACTIVITIES

Awards
Best poster presentation award "In situ gel forming vehicle for the delivery of Lactobacillus gasseri into vaginal cavity" 2nd classified, 11th AItUN Annual Meeting, 11-12th May 2017.

Editorial activity
Guest Editor for the Special Issue "Chitosan and Chitosan Derivatives in Biomedical Applications" Polymers, an Open Access Journal by MDPI.
Editorial Board Member for the scientific journal Polymers since September 2nd, 2021.

Invited presentations

1. "Human pancreatic islets encapsulation in alginate-based beads". 8th A.It.U.N. Annual Meeting. Medicines for children's safe: challenges and opportunities. March 6-7, 2014 – Pavia (Italy).

2. "Adipose stromal vascular fraction within 3D Natural scaffolds: a promising approach for intraoperative advanced therapies". 9th A.It.U.N. Annual Meeting. From food to pharma: the polyhedral nature of polymers. May 25-27, 2015 – Milan (Italy).

3. "Platelet lysate as a successful replacement for fetal bovine serum in human nucleus pulposus cell cultures". 2015 GISM Annual Meeting. October 8-9, 2015 – Brescia (Italy).

4. "Random and aligned alginate-based fibers for the treatment of spinal cord injuries". Advanced School in Nanomedicine, 17th Edition of the Summer School for Italian PhD students in Pharmaceutical Technology. September 25-29, 2017 - Pula (CA, Italy).

5. "Innovative drug delivery systems for the treatment of bed sores". 12th A.It.U.N. Annual Meeting. Medicines for older people: advances in drug delivery. May 10-11, 2018 - Bologna (Italy).

6. "Alginate-based electrospun nanofibers for the treatment of spinal cord injuries (SCI)". Research and Nanomedicine 2018, 3rd Edition. June 14, 2018 – Pavia (Italy).

7. "In situ gelling systems for the local delivery of natural compounds in the treatment of oral mucositis". Summer School in "Innovation in local drug delivery". September 25-28, 2018 – Como (Italy).

8. "Anionic polysaccharide-based nanosystems as innovative tools for nervous tissue repair". 4th NANOMED EMJMD's workshop (videoconference). July 7-9, 2021 – Angers (France).

9. "Spermidine as neuroprotective agent and cross-linker for gellan gum nanofibers in the treatment of nervous tissue injuries" (online presentation). Congresso della società italiana biomateriali (SIB). July 11-14, 2021 – Lecce (Italy).

10. "Spermidine as multifunctional agent in the design of innovative tools for nervous tissue repair" (online presentation) NanoInnovation 2021 – Special Event: YoungInnovation; the state of research communicated by young researchers. September 22-24, 2021 – Rome (Italy).

Grants

She is participating in the following ongoing projects:
- European Commission H2020-NMBP-HUBS-2018, Project ID: 814607 "Safety testing in the life cycle of nanotechnology-enabled medical technologies for health";
- Italian Ministry of the University PNRR - PE10: on Foods Research and innovation network on Food and Nutrition.

Patents

Co-inventor of **2 patents**:

1. Giannini G, Merlo Pich E, Valenti P, **Vigani B**, Rossi S, Ferrari F. "*Formulazione solida mucoadesiva comprendente probiotici per uso nella prevenzione e nel trattamento di disbiosi orale*" ("Development of mucoadhesive solid formulation for the delivery of probiotics in the treatment/prevention of oral dysbiosis"). Patent Application (102021000010802) on April 29th, 2021.
2. Collina S, Rossi D, Linciano P, Listro R, Rossino G, Peviani M, Rossi S, **Vigani B**, Cavaletti GA, Miloso M, Malacrida A. Substituted vinyl piperazine-piperidine urea derivatives as anticancer agents. Request for grant of a European patent UPV-0001/EP/PRI.

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s) English

Job-related skills

Consolidated skills in the design, development and characterization of mucoadhesive and in situ gelling formulations and lipid and polymeric nanosystems, in the statistical processing of data and in the use of Design of Experiment (DoE) approach (Statgraphics software).

Excellent practical skills developed by using on a day-to-day basis Mini Spray Dryer 191 (Büchi), micro-encapsulation system (Nisco Engineering AG), Particle Size and Zeta Potential Analyzer Litesizer 500 (Anton Paar), TA.XT plus Texture Analyzer (Stable MicroSystems), rotational rheometer (Haake RS 600 e Anton Paar MCR 102), tensiometer for surface and interfacial tension measurement (DyneMaster DY-300, Kyowa), conductivity meter (FiveGo F3, Mettler Toledo), electrospinning apparatus (STKIT-40 Linari Engineering), N5 Submicron Particle Size Analyzer (Beckman Coulter), Malvern Mastersizer 3000E (Alfatest), freeze-dryer Epsilon 2-4 LSCplus (Martin Christ Gefriertrocknungsanlagen GmbH).

Continuous experience in the use of several cell lines: a) normal human dermal fibroblasts, HeLa cells and Schwann cells for in vitro biopharmaceutical studies (cytotoxicity and cellular proliferation tests) and b) mesenchymal stem cells derived from adipose tissue, pancreatic islets, articular and nasal septal chondrocytes and nucleus pulposus-derived cells for the production of tissue engineering products. Cell culture competences: preparation of cell culture media, cell seeding and expansion, passaging, thawing and freezing, MTT test, wound healing test (use of culture inserts for the evaluation of formulation capacity to promote gap closure), use of ELISA kits, cell fixation and staining of cellular specimens for morphological investigations by using Scanning Electron Microscope (SEM) and Confocal Microscope.

ADDITIONAL INFORMATION

Statement of Research Interests

Her current research activities focus on the development of therapeutic platforms, consisting of electrospun nanofibers and porous scaffolds, for the treatment of nervous tissue injuries (spinal cord and peripheral nerve injuries, SCI and PNI respectively) and the management of chronic skin lesions. Moreover, she is currently interested in developing mucoadhesive and i*n situ* gelling formulations for the treatment of mucosal lesions, in particular those associated to oral mucositis induced by radio and chemotherapies and sexually transmitted infections.

In the year, she is dealing with the design of a thermo-gelling and mucoadhesive system intended to be administrated as nasal spray for the preventive treatment of viral infectious diseases.

Publications

total number of publications in peer-review journals: 76
total number of citations: 1576
H index (Scopus): 25
Barbara Vigani ORCID Id: 0000-0002-9080-4939

Selected relevant publications (max 10)

1. Vigani B, Faccendini A, Rossi S, Sandri G, Bonferoni MC, Gentile M, Ferrari F. Development of a Mucoadhesive and In Situ Gelling Formulation Based on κ-Carrageenan for Application on Oral Mucosa and Esophagus Walls. I. A Functional In Vitro Characterization. Marine Drugs (2019); 17 (2): 112.
2. Vigani B, Rossi S, Gentile M, Sandri G, Bonferoni MC, Cavalloro V, Martino E, Collina S, Ferrari F. Development of a Mucoadhesive and an in Situ Gelling Formulation Based on κ-Carrageenan for Application on Oral Mucosa and Esophagus Walls. II. Loading of a Bioactive Hydroalcoholic Extract. Marine Drugs (2019); 17 (153).
3. Vigani B, Faccendini A, Rossi S, Sandri G, Bonferoni MC, Grisoli P, Ferrari F. Development of a Mucoadhesive in Situ Gelling Formulation for the Delivery of Lactobacillus gasseri into Vaginal Cavity. Pharmaceutics (2019); 11(10): E511.
4. Vigani B, Rossi S, Sandri G, Bonferoni MC, Rui M, Collina S, Fagiani F, Lanni C, Ferrari F. Dual-Functioning Scaffolds for the Treatment of Spinal Cord Injury: Alginate Nanofibers Loaded with the Sigma 1 Receptor (S1R) Agonist RC-33 in Chitosan Films. Marine Drugs (2020); 18(1): E21.
5. Vigani B, Valentino C, Cavalloro V, Catenacci L, Sorrenti M, Sandri G, Bonferoni MC, Bozzi C, Collina S, Rossi S, Ferrari F. Gellan-Based Composite System as a Potential Tool for the Treatment of Nervous Tissue Injuries: Cross-Linked Electrospun Nanofibers Embedded in a RC-33-Loaded Freeze-Dried Matrix. Pharmaceutics (2021); 13(2): 164.
6. Vigani B, Valentino C, Sandri G, Listro R, Fagiani F, Collina S, Lanni C, Bonferoni MC, Caramella CM, Rossi S, Ferrari F. A Composite Nanosystem as a Potential Tool for the Local Treatment of Glioblastoma: Chitosan-Coated Solid Lipid Nanoparticles Embedded in Electrospun Nanofibers. Polymers (2021);13(9):1371.
7. Vigani B, Valentino C, Sandri G, Caramella CM, Ferrari F, Rossi S. Spermidine Crosslinked Gellan Gum-Based "Hydrogel Nanofibers" as Potential Tool for the Treatment of Nervous Tissue Injuries: A Formulation Study. International Journal of Nanomedicine (2022);17: 3421-3439.
8. Valentino C, Vigani B, Fedeli I, Miele D, Marrubini G, Malavasi L, Ferrari F, Sandri G, Rossi S. Development of alginate-spermidine micro/nanogels as potential antioxidant and anti-inflammatory tool in peripheral nerve injuries. Formulation studies and physico-chemical characterization. International Journal of Pharmaceutics (2022); 626:122168.
9. Pino P*, Vigani B*, Valentino C, Ianev D, Ruggeri M, Boselli C, Icaro Cornaglia A, Grisoli P, Onida B, Bosco F, Sandri G, Rossi S. Sustainable whey proteins-nanostructured zinc oxide-based films for the treatment of chronic wounds: New insights from biopharmaceutical studies. International Journal of Biological Macromolecules (2024); 263:130655.
10. Vigani B, Ianev D, Adami M, Valentino C, Ruggeri M, Boselli C, Icaro Cornaglia A, Sandri G, Rossi S. Porous Functionally Graded Scaffold prepared by a single-step freeze-drying process. A bioinspired approach for wound care. International Journal of Pharmaceutics (2024); 656:124119.

Pavia, 10/06/2024

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