

BIOGRAPHICAL SKETCH

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NAME: Serena Danti

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POSITION TITLE: Associate Professor in Materials Science and Engineering (IMAT-01/A)

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Pisa	MSC	26/02/2003	Chemical Engineering
University of Pisa	PhD	14/03/2007	Major in Materials Health Technologies: Evaluation and Management of Innovations in the Biomedical Field

A. Personal Statement

I have worked at the University of Pisa as Contractor, PhD Student, Scholarship Holder, Research Fellow, Fixed-term Researcher art. 24 c. 3 lett. a) L. 240/2010 and Fixed-term Researcher art. 24 c. 3 lett. b) L. 240/2010, both in the s.s.d. ING-IND/22 (now called IMAT-01/A). In short, I graduated in Chemical Engineering with a focus on Materials, and mainly worked on the production and characterization of materials for applications in medicine (in particular: materials for deafness, materials for skin contact, materials for bone reconstruction, and more recently materials for the encapsulation of drugs and nutraceutical products) having developed a good part of my professional experience in close contact with the medical and healthcare environment. In recent years, I have developed, at the research group of the Department of Civil and Industrial Engineering (DICI) where I work as an Associate Professor using biopolymers to produce fibers and fibrous materials by electrospinning technique and more recently 3D printing and bioprinting.

Ongoing and recently completed projects that I would like to highlight include:

RESPONSIBLE for the THIRD-PARTY CONSULTANCY CONTRACT stipulated between the company Montefibre MAE Technologies (MMT) S.r.l. (Milan) and the Department of Civil and Industrial Engineering (University of Pisa) for a research assignment on "**Study and application of green solvents in the Lyocell process**" (April 2025 – in progress).

RESPONSIBLE for the THIRD-PARTY CONSULTANCY CONTRACT stipulated between the company Montefibre MAE Technologies (MMT) S.r.l. (Milan) and the Department of Civil and Industrial Engineering (University of Pisa) for a research assignment on "**Evaluation of the use of green solvents for cellulose spinning**" (July 2023 – June 2024).

Scientific articles related to this project

1. Vasili E, Azimi B, Raut MP, Gregory DA, Mele A, Liu B, Römhild K, Krieg M, Claeysens F, Cinelli P, Seggiani M, **Danti S***. A Green Method for Bacterial Cellulose Electrospinning Using 1-Butyl-3-Methylimidazolium Acetate and γ -Valerolactone. *Polymers*. 2025; 17(9):1162.
2. Ismaeilimoghadam S, Azimi B, Jonoobi M, **Danti S***. Highly performing polysaccharide hydrogels can replace acrylic acid-based superabsorbent polymers in sanitary napkins. *Macromolecular Materials and Engineering* 2025, 310(3), 2400278
3. Azimi B, Sepahvand S, Ismaeilimoghadam S, Kargarzadeh H, Ashori A, Jonoobi M, **Danti S**. Application of cellulose-based materials as water purification filters: a state-of-the-art review. *Journal of Polymers and the Environment*, 2024, 32(1), 345–366.
4. Azimi B, Rasti A, Fusco A, Macchi T, Ricci C, Hosseinifard A, Guazzelli L, Donnarumma G, Bagherzadeh R, Latifi M, Roy I, **Danti S***, Lazzeri, A. Bacterial cellulose electrospun fiber mesh coated with chitin nanofibrils for eardrum repair. *Tissue Engineering - Part A*, 2024, 30(7-8), 340–356.
5. Ismaeilimoghadam S, Jonoobi M, Ashori A, Shahraki A, Azimi B, **Danti S***. Interpenetrating and semi-interpenetrating network superabsorbent hydrogels based on sodium alginate and cellulose nanocrystals: A biodegradable and high-performance solution for adult incontinence pads. *International Journal of Biological Macromolecules*, 2023, 253, 127118.
6. Sepahvand S, Kargarzadeh H, Jonoobi M, Ashori A, Ismaeilimoghadam S, Varghese RT, Chirayl CJ, Azimi B, **Danti S**. Recent developments in nanocellulose-based aerogels as air filters: A review. *International Journal of Biological Macromolecules*, 2023, 246, 125721.
7. Ismaeilimoghadam S, Jonoobi M, Hamzeh Y, **Danti S***. Effect of nanocellulose types on microporous acrylic acid/sodium alginate super absorbent polymers. *Journal of Functional Biomaterials*, 2022, 13(4), 273.
8. Azimi B, Maleki H, Gigante V, Bagherzadeh R, Mezzetta A, Milazzo M, Guazzelli L, Cinelli P, Lazzeri A, **Danti S***. Cellulose-based fiber spinning processes using ionic liquids. *Cellulose*, 2022, 29(&): 3079 - 3129.
9. Ismaeilimoghadam S, Sheikh M, Taheri P, Maleki S, Hossien R, Jonoobi M, Azimi B, **Danti S**. Manufacturing of fluff pulp using different pulp sources and bentonite on an industrial scale for absorbent hygienic products. *Molecules*, 2022, 27(15), 5022.
10. Romano L, Portone A, Coltelli M-B, Patti F, Saija R, Iatì MA, Gallone G, Lazzeri A, **Danti S**, Maragò, OM, Camposeo A, Pisignano D, Persano L. Intelligent non-colorimetric indicators for the perishable supply chain by non-wovens with photo-programmed thermal response. *Nature Communications*, 2020, 11(1), 5991.

B. Positions, Scientific Appointments, and Honors

2023 – perm	Associate Professor, full time, in Materials Science and Engineering (IMAT-01/A), Department of Civil and Industrial Engineering (DICI), University of Pisa, Italy
2020 – 2023	Tenured Assistant Professor (Senior Researcher, RTD-B), full time, in Materials Science and Engineering (IMAT-01/A), Department of Civil and Industrial Engineering (DICI), University of Pisa, Italy
2016 – 2020	Assistant Professor (Junior Researcher, RTD-A), full-time, in Materials Science and Engineering (IMAT-01/A), Department of Civil and Industrial Engineering (DICI), University of Pisa, Italy
2015 – 2016	Research fellowship (Borsa di ricerca), Azienda Ospedaliero-Universitaria Pisana, (AOUP), Pisa, Italy
2011 – 2012	Post-Doctoral fellowship (Assegno di ricerca), Dept. of Surgical, Medical, Molecular Pathology and Emergency Medicine, UNIP, Italy.
2009 – 2011	Research Fellowship (Borsa di ricerca), Dept. of Neuroscience, University of Pisa, Italy.
2009 – 2011	Research Fellowship (Borsa di ricerca) AOUP, Pisa, Italy
2006 – 2009	Post-Doctoral fellowship (Assegno di ricerca), Dept. of Oncology, Transplants and New technologies in Medicine, University of Pisa, Italy
2006	Associate Research Scholar, Center for Excellence in Bioengineering, Rice Univ., Houston, TX, USA
2004 – 2006	Ph.D., University of Pisa, Pisa Italy
2003 – 2004	Research contracts (co.co.co), Dept. of Chemical Engineering, University of Pisa, Pisa, Italy.

Institutional Responsibilities:

2020-2023	Elected member of the Academic Senate of the University of Pisa Rectoral Decree n. 1973/2020 of 27.11.2020 as Representative of junior/senior researchers [n. 1 representative for all researchers of the university, approximately 360] where I was a member of the Research Commission
2020-2024	Member of the Board (junta) of the Department of Civil and Industrial Engineering of the University of Pisa, as representative of junior and senior researchers
2020-2024	Adjunct member of the Research Commission of the Department of Civil and Industrial Engineering of the University of Pisa
2020-2024	Delegate of the Director of the Department of Civil and Industrial Engineering of the University of Pisa for the Ranking
2020-2028	Delegate of the Director of the Department of Civil and Industrial Engineering of the University of Pisa for the Job Placement
2024-present	Member of the AVA3 Commission of the Doctoral Course in Clinical and Translational Sciences of the University of Pisa
2016-present	Member of the PhD college of the PhD program Clinical and Translational Sciences, University of Pisa, Italy
2023-present	Member of the PhD college of the PhD program Life Sciences "PEGASO", Associated PhD program, Regione Toscana, Italy
2018- present	Responsible for the Biomaterials Curriculum within the master's degree Course in Materials & Nanotechnology (LM-53) of the University of Pisa
2017-present	Reference Professor and Member of the Review Commission of the master's degree Course in Materials & Nanotechnology (LM-53)
2021-present	Expert member (degree class LM-53) of the Examination Commission for the qualification to practice as an Engineer, University of Pisa

Honors

2017	Ada Lovelace Day (ALD), International celebration women STEM
2011	Young researchers' award, Faculty of Medicine and Surgery, University of Pisa, Italy
2009	European Science Foundation (ESF) Conference Grant (Bertinoro, Italy)
2008	6th Marie Curie Conference on Stem cells (Algarve, Portugal)
2007	3rd Marie Curie Conference on Biomineralisation (Madeira, Portugal)
2006	THERMEC Conference grant (Vancouver, Canada)

C. Contributions to Science

This project idea arises as a synergistic result from my interests in biopolymers, health-attention and fiber technology, which collectively have defined my research pathway. The selected outputs collectively showcase my expertise at the intersection of green solvent systems, cellulose processing, and sustainable fiber technologies, all of which are foundational pillars of the proposed project. The shown achievements illustrate my scientific leadership, ability to coordinate cross-sector collaborations, and deep knowledge in both fundamental research and applied technology transfer relevant to the proposed project.

As the Principal Investigator and Responsible Scientist for two third-party consultancy contracts with **Montefibre MAE Technologies S.r.l. (MMT, Milan)**, I led strategic industrial research on the application of green solvents in the Lyocell process. In both projects, my role involved designing the experimental framework, selecting and characterizing green solvents, and evaluating their performance in cellulose dissolution and spinning. These activities are directly aligned with the objective of the proposed project, green electrospinning of bacterial cellulose, and demonstrate industrial interest in a green transition in fiber processing. The work facilitated key

advances in process development and positioned me as a technical bridge between academic innovation and industrial implementation.

My scientific publications further support my capacity to lead this project by demonstrating a sustained research trajectory in cellulose-based materials, bio-based polymers, electrospinning, nanocellulose integration and biodegradable systems:

- Recently published (e.g. Vasili, E. et al., *Polymers*, 2025) focus on a **green method for Bacterial Cellulose electrospinning** using 1-Butyl-3-Methylimidazolium Acetate and γ -Valerolactone.
*Vasili E, Azimi B, Raut MP, Gregory DA, Mele A, Liu B, Römhild K, Krieg M, Claeysens F, Cinelli P, Seggiani M, Danti S**. A Green Method for Bacterial Cellulose Electrospinning Using 1-Butyl-3-Methylimidazolium Acetate and γ -Valerolactone. *Polymers*. 2025; 17(9):1162.
- Highly cited publications (e.g., Azimi et al., *Cellulose*, 2022) focus on **ionic liquid-based cellulose fiber spinning**, laying the groundwork for LYOSPIN's exploration of alternative solvent systems. These studies include rheological and morphological analysis of spinning dopes
- Highly cited publications (e.g. Azimi et al., *Front. Bioeng. Biotechnol.* 2021) highlight the promising use of **bacterial cellulose (BC)** as a biocompatible and mechanically suitable scaffold for tympanic membrane (TM) repair, emphasizing its unique properties such as elasticity, water retention, and strength that make it an excellent candidate for tissue engineering applications in restoring TM perforations.
*Azimi B, Maleki H, Gigante V, Bagherzadeh R, Mezzetta A, Milazzo M, Guazzelli L, Cinelli P, Lazzeri A, Danti S**. Cellulose-based fiber spinning processes using ionic liquids. *Cellulose*, 2022, 29(&): 3079 - 3129.
- Other works (e.g., Ismaeilimoghadam et al., *IJBM*, 2023; *Tissue Engineering Part A*, 2024) highlight the engineering of cellulose and bacterial cellulose composites with tunable properties, demonstrating core competencies necessary for tailoring alternative cellulose sources and improving processability.
- A strong track record in bio-based superabsorbents and filtration materials (e.g., *Macromol. Mater. Eng.*, 2025; *J. Polym. Environ.*, 2024) shows my ability to develop functional materials from biomass, with relevance to end-use applications and circular economy goals.
- My role as corresponding or senior author (indicated by *) on key articles attests to my leadership in formulating hypotheses, coordinating experimental design, supervising data analysis and guiding manuscript preparation, skills critical for managing a complex, interdisciplinary ERC-funded project.
- My primary role in review articles (e.g., Nanocellulose-based aerogels, Cellulose-based filters) shows my capacity to critically assess the state-of-the-art, identify knowledge gaps and define future directions.
- The collaborative nature of these publications, with contributions from international authors in Materials Science overall demonstrates my ability to build and manage multidisciplinary networks.

Finally, the inclusion of my work in high-impact journals such as *Nature Communications*, *Tissue Engineering A*, and *Cellulose* illustrates the scientific rigor and relevance of my research output. Collectively, these achievements affirm my technical qualifications, project management skills, and visionary capability to lead the proposed project for the electrospinning of BC through green chemistry and sustainable process innovation.