

Biography

Claudia Pigliacelli is an Associate Professor in the Department of Chemistry, Materials and Chemical Engineering “Giulio Natta” at Politecnico di Milano. She received her PhD in Pharmacy from the University of East Anglia in 2015. She was a research assistant and postdoctoral researcher at Politecnico di Milano from 2013 to 2016, and subsequently held postdoctoral positions at Aalto University, Finland, from 2016 to 2019, and at the Universidade da Coruña, Spain, in 2020.

Her research focuses on the design of nanoscale systems based on peptides and inorganic nanoparticles, with applications primarily, though not exclusively, in the biomedical field.

Abstract

From Peptide Self-Assembly to Functional Bioinspired Nanomaterials

Peptide self-assembly is a versatile strategy for developing nanoscale materials with tailored structures and functionalities. Our work in this field focuses on the design of short self-assembling peptides capable of forming customized nanosystems and serving as functional additives and/or templates in hybrid biomaterial design. In this talk, I will present the synthesis of hybrid pentapeptide–gold nanoscale systems [1,2]. I will then discuss how rationally designed short peptides can modulate the self-assembly behavior and properties of biopolymer-based nanosystems, further expanding their role as functional additives [3]. Finally, I will introduce peptide nanovesicles with enhanced proteolytic stability and explore their potential as drug carriers. Overall, these findings highlight ultrashort peptides as versatile and tunable building blocks for next-generation bioinspired nanoscale systems with potential biomedical applications.

References

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- [3] A. Marchetti, E. Marelli, G. Bergamaschi, P. Lahtinen, A. Paananen, M. Linder C. Pigliacelli, P. Metrangolo, *Tailoring Nanocellulose with Short Amyloidogenic Peptides for Improved Mechanical Strength and Barrier Performance*, J. Mater. Chem. B, **2024**, 12, 9229.