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**University of Pavia**

**Ph.D. School of Electrical and Electronics Engineering and Computer Science  
PhD program in Bioengineering, Bioinformatics and Health Technologies**

## **SEMINAR**

### **Heating Up Cancer Cells: Engineering Photothermal Therapy with Gold Nanoparticles**

***Cristina Volpini***

**Molecular Medicine Dept – University of Pavia**

May 8<sup>th</sup> 2025, 11:30 AM - Blue Seminar Room

**Abstract:**

Photothermal therapy (PTT) is an emerging cancer treatment that exploits the ability of gold nanoparticles (AuNPs) to convert light into heat, resulting in localized tumor ablation. The presentation will explore the fundamental principles of AuNP-based PTT, including plasmonic resonance, nanoparticle design and interaction with near-infrared (NIR) light. It will also review the knowledge of traditional cancer treatments and highlight the spatial precision and technical adaptability of PTT. We discuss current biological applications, targeting strategies, in vitro and in vivo results, as well as challenges related to light penetration, nanoparticle clearance and clinical translation. Finally, we explore future directions such as personalized nanomedicine.

**Bio:**

Dr. Cristina Volpini is a postdoctoral researcher at the University of Pavia, where she obtained her PhD in translational and precision medicine. Her work focuses on developing advanced in vitro models to study cell–microenvironment interactions and exploring nanoparticles for innovative therapies, including photothermal therapy.

**Organizer**

Prof. P. Minzioni

**Ph.D. Coordinators**

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Seminar in English

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