



# Monika Gosecka

ASSOCIATE PROFESSOR, COORDINATOR OF THE DEPARTMENT & TEAM LEADER – CMMS PAS ·  
A TASK GROUP CHAIR – IUPAC PROJECT

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## Currently held positions

**Department of Functional Polymers and Polymer Materials, Centre of Molecular and Macromolecular Studies of the Polish Academy of Sciences**

Łódź

ASSOCIATE PROFESSOR

**Department of Functional Polymers and Polymer Materials, Centre of Molecular and Macromolecular Studies of the Polish Academy of Sciences**

Łódź

COORDINATOR

**Cross-linked Materials Team, Centre of Molecular and Macromolecular Studies of the Polish Academy of Sciences**

Łódź

LEADER

**“Nomenclature and terminology for supramolecular polymers”**

IUPAC project

A TASK GROUP CHAIR

## Scientific profile and collaborations

My primary research interest is focused on polymer chemistry and materials science with a strong emphasis on biomedical applications.

My expertise centers on the design, synthesis and characterization of reversibly cross-linked polymer systems, specifically stimuli-sensitive networks (e.g., thermo-sensitive and chemo-responsive materials). This involves the usage of both supramolecular interactions (e.g., homodimerization of glycoluril molecular clips) and reversible covalent bonds (e.g., boronic esters).

My current study concentrates on developing advanced hydrophobized hydrogels as sophisticated drug carriers. These materials are specifically elaborated for delivering poorly water-soluble bioactive compounds in gynecological therapies, including selective anti-cervical cancer and antimicrobial treatments.

Beyond self-healable and injectable hydrogel systems, I am actively investigating the potential of Bingham fluids as highly promising carriers for hydrophobic drugs. Furthermore, biphasic cross-linked materials are being explored as potential advanced dressings for the therapy of chronic diabetic foot ulcers.

My investigations are conducted in cooperation with the University of Lodz, Lodz University of Technology, and the University of Wrocław.

## Selected publications

- 2025 *Reversibly Cross-Linked Asymmetric Hybrid Open-Polysilsesquioxane Films Enhancing Clotrimazole Bioavailability and Anti-Candida Mature Biofilm Activity for Vaginal Therapy* [\[link\]](#)
- 2025 *Construction of Dynamic Hydrogel Inducing Effective and Selective 5-Fluorouracil Monotherapy against Cervical Cancer Cells* [\[link\]](#)
- 2024 *Enhanced Solubility and Bioavailability of Clotrimazole in Aqueous Solutions with Hydrophobized Hyperbranched Polyglycidol for Improved Antifungal Activity* [\[link\]](#)

## Research grants

**Principal Investigator:** 4 grants: SONATA, SONATA BIS, OPUS - Narodowe Centrum Nauki, Proof of Concept, Fundacja na Rzecz Nauki Polskiej

**Co-Investigator:** 8 grants: KBN, NCN, MNiSW

## Obtained patents

6 patent submissions (Polish Patent Office)

## International research stays

**France,** École Supérieure de Physique et Chimie Industrielles de la Ville de Paris, one-year stay in Prof. Ludwik Leibler' Team