# Doctoral School of Information and Biomedical Technologies Polish Academy of Sciences (TIB PAN Doctoral School)

**SUBJECT:** Polymeric scaffolds for anticancer therapies

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**DESCRIPTION:** Photodynamic therapy (PDT) is emerging as a targeted, minimally invasive strategy for cancer treatment, capable of inducing localized cytotoxicity through the activation of photosensitizing agents by light. This topic explores a new frontier in Photodynamic therapy by developing biologically inspired, cell-based substrates that function as smart delivery systems for anticancer agents. These innovative carriers will not only deliver photoactive molecules directly to tumor sites but also provide a biocompatible and structurally supportive environment conducive to tissue regeneration.

The core focus is on engineering advanced multifunctional scaffolds using 3D printing and hydrogels. These systems will be tailored to release photosensitizers in a controlled manner. This approach holds transformative potential for treating skin cancers while minimizing systemic toxicity and promoting healing.

**REQUIREMENTS:**

- MSc degree in Materials Science and Enginnering, Nanotechnology, Biomedical Engineering, Chemistry, or related fields.
- Strong background in biomaterials and polymers.
- Experience in fabrication techniques such as 3D printing or hydrogel synthesis.
- Familiarity with characterization methods (e.g., SEM, FT-IR, XRD, DSC, TGA).
- Experience in *in-vitro* analysis will be the advantage
- Ability to conduct independent research and collaborate in an interdisciplinary team.
- Experience in scientific communication and publication in English**.**

**BIBLIOGRAPHY:**

1. Gunaydin, G., Gedik, M. E., & Ayan, S. (2021). Photodynamic therapy for the treatment and diagnosis of cancer–a review of the current clinical status. Frontiers in chemistry, 9, 686303.
2. Alvarez, N., & Sevilla, A. (2024). Current advances in photodynamic therapy (PDT) and the future potential of PDT-combinatorial cancer therapies. International Journal of Molecular Sciences, 25(2), 1023.