1	CEIPEX RESEARCH TOPIC LEVEL2: advanced biomaterials
2	RESEARCH GROUP: **Advanced Biomaterials (L. Vojtová)**
3	TOPICS/FOCUS: **Radical-free photocrosslinkable hydrogels for 3D bioprinting of advanced cartilage constructs**
4	SUMMARY: 3D bioprinting is rapidly emerging as a transformative technology in regenerative medicine, enabling the fabrication of complex, patient-specific tissue constructs with unprecedented spatial precision. Among the strategies employed in this field, photocrosslinking has gained particular attention due to its ability to provide spatiotemporal control over the biochemical and mechanical properties of biomaterials. Hydrogels represent the principal class of bioinks for such applications; however, conventional photocrosslinking methods often rely on photoinitiators that generate free radicals, which may compromise cell viability and hinder clinical translation. This project seeks to advance the field by developing a new generation of radical-free, photocrosslinkable hydrogels specifically designed for 3D bioprinting applications. The research will focus on engineering dynamic polymeric networks that can be rapidly stabilized under cytocompatible light conditions, thereby ensuring precise spatiotemporal gelation without the limitations of radical-mediated chemistry. The resulting materials are expected to combine high printability, mechanical robustness, and biocompatibility, establishing an advanced platform for biofabrication and regenerative medicine of cartilage tissue.
5	RG WEBPAGE/CONTACT: https://biomaterials.ceitec.cz/