PhD Project: On-going

CPS

Polymer based photothermal nanoparticles

PhD Candidate: Zeliha Ozcelik

Synthesis of new natural polymer-based photothermal nanoparticles for antibacterial surfaces and photothermal cancer therapy applications

Photothermal materials can efficiently convert light to heat by the non-emissive deactivation of harvested light, resulting in significant local temperature elevations. The heat generated by the light-activation of photothermal materials can trigger a multitude of thermal processes that are easily controllable. Light-to-heat conversion properties of photothermal materials can be utilized in a wide range of critical applications, including the disruption of tumors by laser light, light-activated sterilization of surfaces by killing microbes, solar-driven water evaporation for desalination/purification, light-activated controlled release of molecules and design of light-activated shape-memory/self-healing materials. In Zeliha Ece Ozcelik's study, novel-designed nanoparticles/polymer backbones will be developed using natural flavonoids as the monomer source and used in photothermal cancer therapy and the creation of the antibacterial/self-disinfection surface.