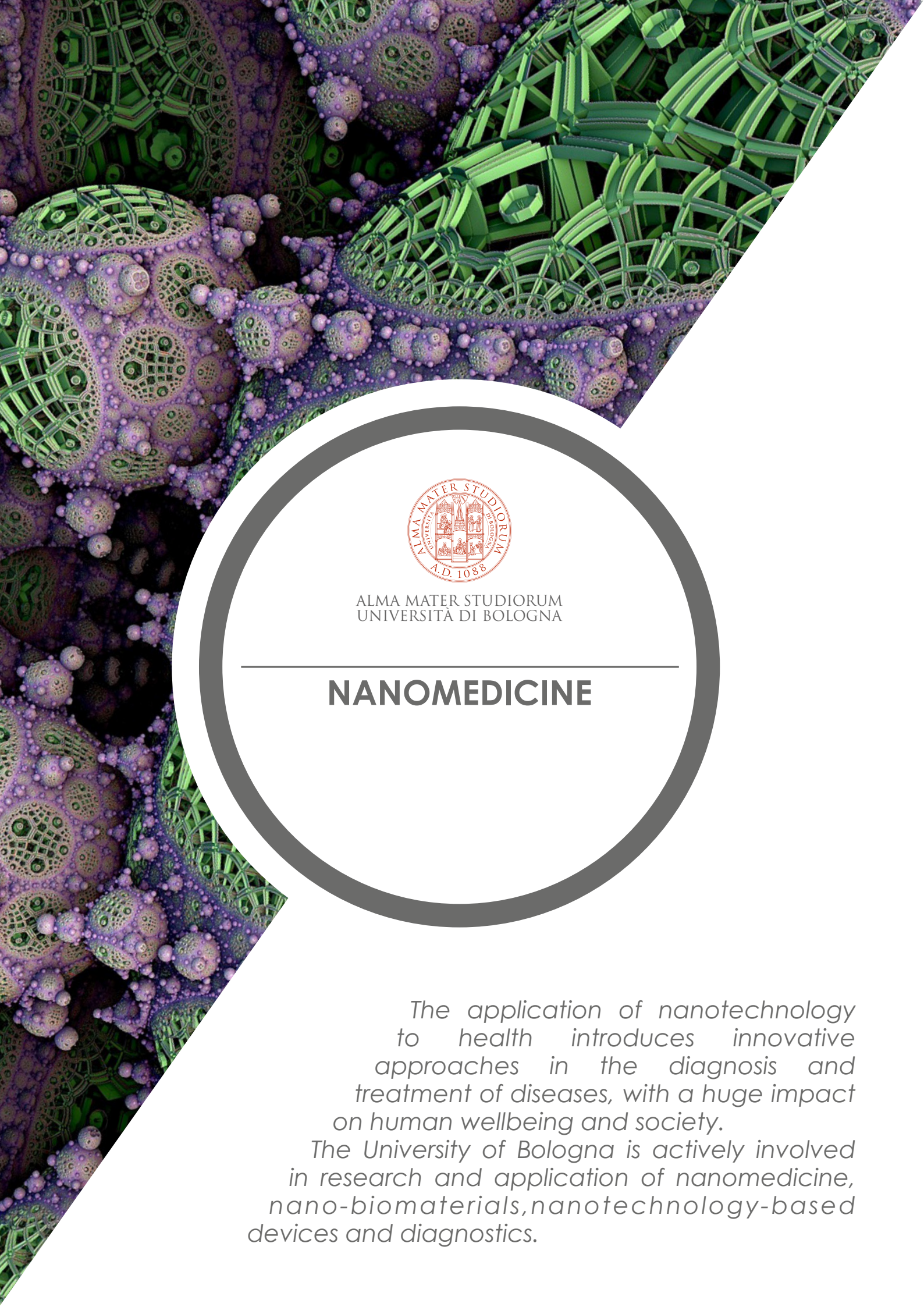

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

NANOMEDICINE

The application of nanotechnology to health introduces innovative approaches in the diagnosis and treatment of diseases, with a huge impact on human wellbeing and society.

The University of Bologna is actively involved in research and application of nanomedicine, nano-biomaterials, nanotechnology-based devices and diagnostics.

The deep knowledge in chemistry, physics, biology, medicine and engineering, is exploited through an interdisciplinary collaborative effort. University of Bologna is an active partner of the European Technology Platform on Nanomedicine.
The Research of the University of Bologna covers a wide range of issues:

- Nanotechnology-based diagnostics
- Functional imaging: hard and soft nanoparticles for image-guided surgery in nanomedicine; nanoparticles for targeted tumor imaging; ultra-bright and stimuli-responsive fluorescent nanoparticles for bioimaging. Electrochemical imaging
- Understanding protein–nanoparticle interactions
- DNA Nanotechnology: DNA and nucleic acids as building material for nanostructures by design
- Atomic Force Microscopy and related techniques to study biological macromolecules and their interaction with materials. Characterization of nucleic acids and of proteins, also using the 'single molecule force spectroscopy' to study of the mechanochemical behavior of molecules
- Nanobiotech-enabled biosensing platform
- Nanomaterials for tissue and organ regeneration
- Development of magnetic nanoparticles to functionalize scaffolds
- Gold nanorods and magnesium nanoparticles embedded into synthetic and natural biopolymers: non-toxic nano-heaters for cancer therapy
- Theranostic applications in Nanomedicine
- Design and development of nanoparticles and nanofibers for targeted drug delivery and drug release systems. Multi-drug-loaded materials to inhibit neuroinflammation and prevent neurodegeneration
- Dendrimers as scaffolds for constructing functional nanoscale devices
- Computational bionanotechnology: iInteraction of biomolecules with carbon nanoparticles; modelling cellular membrane permeation; reverse docking techniques to analyze systematically interaction between nanoparticles and proteome
- Nanofibers and nanoparticles fabrication through electrospinning and electrospraying

HIGHLIGHTS

Multifunctional Nanoparticles. Dye-doped silica nanoparticles as luminescent organized systems for nanomedicine. Biodegradable functionalized polymeric nanoparticles for targeted drug release. Surface functionalized nanoparticles to design 'nanobioreactors' with applications for magnetic fluid hyperthermia, targeted drug delivery and phototermal ablation.

Nanohybrids for photodynamic applications. The combination of a photosensitizing nanohybrid and focused irradiation, generating reactive oxygen species, has the potential to act specifically at the desired site of action, lowering the collateral damage to healthy cells.