

## P5. Nanotechnology and cancer applications

Mehmet Gökdeniz, Muhsin Akbaba, Ersin Nazlıcan  
cukurova university faculty of medicine, public health department

Applications of nanotechnology in various disciplines of medicine particularly cancer care are becoming increasingly popular so much so that the process of replacing traditional health-care by nanomedicine had already begun. Nanomedicine focuses on the formulations of imaging, diagnostic and therapeutic agents, which can be carried by biocompatible nanoparticles, for the purpose of cancer/ disease management. Common nanomaterials and devices applicable in cancer medicine are liposomes, polymeric-micelles, dendrimers, nano-cantilevers, carbon nanotubes, quantum dots, magnetic-nanoparticles, gold nanoparticles (AuNPs) and certain miscellaneous nanoparticles. Here, we present review of the structure, function and utilities of the various approved, under trial and pretrial nanodevices applicable in the cancer care and medicine.

**Liposomes:** Liposomes are 50-100 nm size phospholipid-vesicles used for carrying drugs to the target site minimizing the bio-distribution toxicity and a number of such theranostics have been approved for clinical practice.

**Polymeric micelles:** These are nanoparticles of 10-100 nm size and capable of carrying the drug also prevent drug aggregation and embolism.

**Dendrimers:** A multifunctional dendrimer conjugate with imaging, targeting and drug molecules of paclitaxel has been recently synthesized for cancer theranostic applications.

**Nano-cantilever:** Nano-cantilever based assays are likely going to replace the conventional methods of chemical pathological investigations.

**Carbon nanotubes:** Carbon nanotubes are emerging for utility in regenerative and cancer medicine.

**Quantum dots:** Quantum dots hold great promise for the micrometastasis and intraoperative tumor imaging.

**Magnetic-nanoparticles:** Important applications of magnetic nanoparticles are in the cardiac stents, photodynamic therapy and liver metastasis imaging.

**The AuNPs:** The AuNPs have been employed for cell imaging, computed tomography and cancer therapy. However, the use of nanoparticles should be cautious since the toxic effects of nanoparticles are not well-known. The use of nanoparticles in the clinical practice and their toxicity profile require further extensive research

**Keywords:** Nanotechnology, nanoparticles, cancer