

## **Internal Webinar**

### **Nanobioconjugates for Tumor Targeted Delivery of Therapeutic Agents and Bio-Imaging**

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Cancer is the second leading cause of deaths worldwide after cardiovascular diseases. Despite advancements in the current treatment methods, early detection and targeted therapy still remains a clinical challenge. In this regard, nanotechnology plays a crucial role in development of alternative strategies to overcome these limitations. Researchers are currently working on different types of nanoparticles (liposomal, polymeric, protein, carbohydrate and metal etc.) for disease diagnosis and therapy. Especially gold nanoparticle (AuNPs) based delivery systems for cancer therapy have reached at the level of phase-II clinical trials and got FDA approval for disease diagnosis. Hence we have established various AuNPs based nanoformulations and tested their efficacies on *in vitro* and *in vivo* models. For instance, co-delivery of gene silencing agent (erbB2 siRNA) and anticancer drug (doxorubicin) loaded AuNPs for ovarian cancer therapy was developed. Similarly, we have also developed cationic AuNPs based targeted gene delivery system to restore the function of tumor suppressor gene (p53) in ovarian cancer model. Additionally, we have established tumor homing peptide (CGKRR) loaded AuNPs for T cell driven immunotherapy through dual gene silencing (PD-L1 and STAT-3) approach. Also, we have developed biosynthesized AuNPs for NIR based bio-imaging and cell labeling applications. Further, these nanoparticles could be used to conjugate with fluorescent probes for real time imaging of neurological diseases, photosensitizers for photodynamic therapy and antibodies to target the diseases.

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