

Accepted Manuscript

Polymer decorated gold nanoparticles in nanomedicine conjugates

Ignác Capek

PII: S0001-8686(16)30361-X
DOI: doi: [10.1016/j.cis.2017.01.007](https://doi.org/10.1016/j.cis.2017.01.007)
Reference: CIS 1716

To appear in: *Advances in Colloid and Interface Science*



Please cite this article as: Ignác Capek , Polymer decorated gold nanoparticles in nanomedicine conjugates. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Cis(2016), doi: [10.1016/j.cis.2017.01.007](https://doi.org/10.1016/j.cis.2017.01.007)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Polymer decorated gold nanoparticles in nanomedicine conjugates.

Ignác Capek

Slovak Academy of Sciences, Polymer Institute, Institute of Measurement Sciences,
Dúbravská cesta, Bratislava, Slovakia.**Abstract**

Noble metal, especially gold nanoparticles and their conjugates with biopolymers have immense potential for disease diagnosis and therapy on account of their surface plasmon resonance (SPR) enhanced light scattering and absorption. Conjugation of noble metal nanoparticles to ligands specifically targeted to biomarkers on diseased cells allows molecular-specific imaging and detection of disease. The development of smart gold nanoparticles (AuNPs) that can deliver therapeutics at a sustained rate directly to cancer cells may provide better efficacy and lower toxicity for treating cancer tumors. We highlight some of the promising classes of targeting systems that are under development for the delivery of gold nanoparticles. Nanoparticles designed for biomedical applications are often coated with polymers containing reactive functional groups to conjugate targeting ligands, cell receptors or drugs. Using targeted nanoparticles to deliver chemotherapeutic agents in cancer therapy offers many advantages to improve drug/gene delivery and to overcome many problems associated with conventional radiotherapy and chemotherapy. The targeted nanoparticles were found to be effective in killing cancer cells which were studied using various anticancer assays. Cell morphological analysis shows the changes occurred in cancer cells during the treatment with AuNPs. The results determine the influence of particle size and concentration of AuNPs on their absorption, accumulation, and cytotoxicity in model normal and cancer cells. As the mean particle diameter of the AuNPs decreased, their rate of absorption by the intestinal epithelium cells increased. These results provide important insights into the relationship between the dimensions of AuNPs and their gastrointestinal uptake and potential cytotoxicity. Furthermore gold nanoparticles efficiently convert the absorbed light into localized heat, which can be exploited for the selective laser photothermal therapy of cancer. We also review the emerging technologies for the fabrication of targeted gold colloids as imaging agents.

Key words: Noble metal colloids, biopolymer-based conjugates, particle uptake, surface plasmon, aptamer, polymer shell, drug delivery, cancer therapy.

Download English Version:

<https://daneshyari.com/en/article/6976681>

Download Persian Version:

<https://daneshyari.com/article/6976681>

[Daneshyari.com](https://daneshyari.com)