



Gold nanoparticles for the development of cancer vaccines

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Abstract

Therapeutic cancer vaccines hold significant promise for achieving long-lasting remission in various forms of advanced stage and/or refractory cancers. Nanoparticle-based vaccine formulations are expected to play a key role in this field.¹ In fact, nanoparticles may considerably improve the presentation of tumor-associated self-antigens or neoantigens to the immune system. Nanoparticles – typically 10–100 nm in diameter – are effectively internalized by antigen presenting cells and can reach draining lymph nodes, allowing a more effective stimulation of the immune system, as recently demonstrated by the COVID vaccines.²

Our work focuses on gold nanoparticles (AuNPs), a nanomaterial that can be prepared reproducibly with excellent control over its physicochemical properties.³ We are interested in understanding how the organic coating of AuNPs influences their interaction with cells of the immune system. In this seminar I will present the strategies developed by our group to coat the surface of AuNPs, including the development of polyglycerol-based coatings. I will also present the preparation of vaccine formulations by immobilization of peptide antigens⁴ and antigen mimics⁵ on their surface, and finally discuss some results of the vaccination campaigns we conducted so far.

References

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