Development of therapeutic cancer nanovaccine candidates

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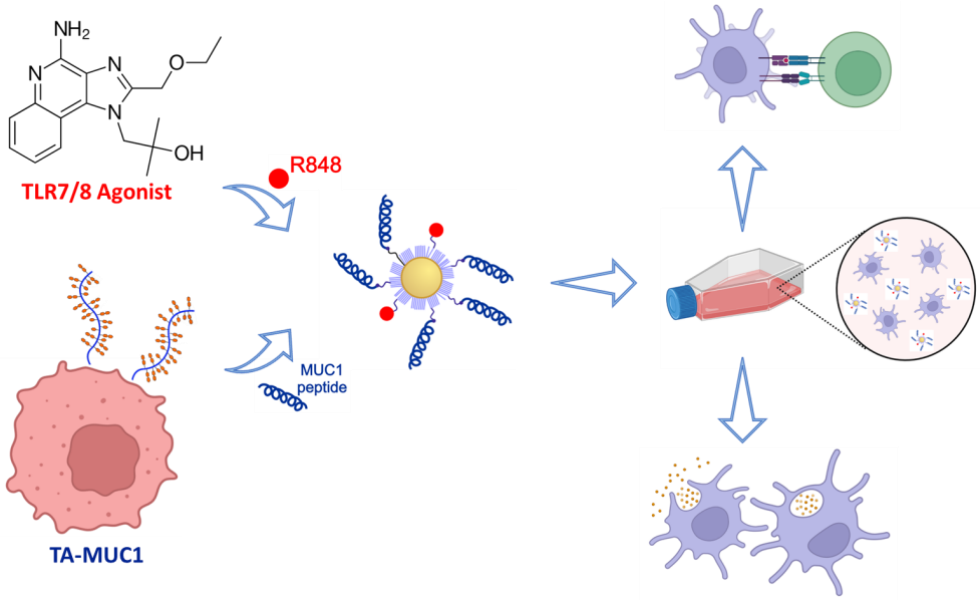
Therapeutic cancer vaccines hold significant promise for achieving long-lasting remission, or even cure, in various forms of advanced stage and/or refractory cancers. Nanoparticle-based formulations are expected to play a key role in this field. In fact, nanoparticles (NPs) may considerably improve tumor-associated self-antigens or neoantigens presentation to the immune system. NPs (typically 10–100 nm), are effectively internalized by antigen presenting cells (APCs) and reach draining lymph nodes, allowing a more effective stimulation of the immune system. Additionally, the organic coating of the NPs may be programmed to adjuvate the immune response if a suitable protein corona forms upon in vivo administration of the vaccine formulation.

This project focuses on gold NPs (AuNPs) coated with poly(ethylene glycol) (PEG) as carriers for tumor-associated self-antigens derived from MUC1, an overexpressed and altered mucin found in different cancer types, due to compelling preliminary results showing good immunogenicity of such vaccine candidates in vivo. To increase the potency of the vaccine, a TLR-7/8 agonist (R848), was conjugated to the surface of the vaccine. Immune cell activation and nanovaccine internalization by antigen presenting cells was studied *in vitro*.



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