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# Synthetic Nano-Antibodies for Immunotherapy

**A synthetic nano-antibody that is a cheaper and more effective alternative immunotherapeutic option**

Georgia Tech Inventors have created a fully synthetic nano-antibody that is a cheaper alternative and has better therapeutic efficacy than existing mAbs in the market. This synthetic antibody has nanoparticle design making it capable of multivalent targeting and activation. The design contributes to improved pharmacokinetics and enables better accumulation and penetration in organs, tissues, and tumors for stronger immune responses. This technology is cheaper and easier to manufacture as it does not involve cell-line handling or animal work. It is also cheaper for patients as it enables treatment to be done in fewer and more effective medicinal dosages.

**Summary Bullets**

- **Cheaper and faster to manufacture**- production only involves synthesis of ligands, nanoparticles, and nano-antibodies; it does not involve cell-lines or animal work
- **More effective**- better accumulation and penetration is achieved due to the nanoparticle design
- **Better for patients**- dosage to achieve therapeutic efficacy is reduced and can lower the price, duration, and frequency of treatment

Solution Advantages

- **Cheaper and faster to manufacture**- production only involves synthesis of ligands, nanoparticles, and nano-antibodies; it does not involve cell-lines or animal work
- **More effective**- better accumulation and penetration is achieved due to the nanoparticle design
- **Better for patients**- dosage to achieve therapeutic efficacy is reduced and can lower the price, duration, and frequency of treatment
- **Progressive**- the proposed methods of the technology can be applied to ameliorate existing methods and can serve as a research platform for antibody-based immunotherapies

Potential Commercial Applications

- Antibody-based cancer or autoimmune disease treatment
- Research platforms regarding immunotherapy methods and targets
- Nanoparticle studies, specifically particle functionalization and dual surface chemistries (i.e. Janus particles)

Background and More Information

Monoclonal antibodies (mAbs) have been around since the beginning of the 20th century and have been primarily used as immunotherapy in autoimmune, cancer, inflammation, and infectious diseases. Despite their broad application in medicine, mAbs are still limited in their production and application. Because of the high cost and long duration in creating new mAbs, the technology is not progressing in its therapeutic potency to meet the challenges of new and more complex tumors and diseases.

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