Researchers at the University of South Florida have developed a potentially safe and effective method for the treatment of various cancers using plasmid DNA gene therapy.

Lung cancer is one of the leading causes of death worldwide. Prognosis for lung cancer patients is poor and such aggressive cancers are difficult to treat, due to drug-induced toxicity. The vast majority of cancers of the lung, breast and colon are adenocarcinomas, which is a type of cancer that forms in mucus-secreting glands throughout the body. The treatment of adenocarcinoma involves various methods like removing the tumor, chemotherapy, radiation therapy, and immunotherapy. Immunotherapy uses medications that support the immune system to kill cancer. Most immunotherapy drugs only prolong life and do not fully cure cancer, however they often produce less side effects than chemotherapy or radiation. Hence, there is a need of an efficient method to treat adenocarcinomas using immunotherapy.

Researchers at USF have developed a novel immunotherapy treatment for lung, breast, ovarian and melanoma cancers. Unlike viral vectors that induce an immune response with associated immunogenicity and systemic toxicity, our plasmid DNA, combined with a chitin-based nanoparticle carrier system, delivers genes with limited toxicity and increased transgene expression, especially in target organs such as the lungs. Tests in nude mice injected with lung cancer cells and later treated with our combined plasmid DNA and carrier showed no tumors in the treated group compared with controls. Hence, this method is effective in the treatment of adenocarcinomas.