

## **Nanomedical Formulations in the Adair Labs**

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The Adair Group in Materials Science and Engineering is focused on the use of nanomedical formulations based on nanoparticles and other nanoscale materials to foster human healthcare. Among the materials systems are calcium phosphosilicate nanoparticles (CPSNPs) that encapsulate a variety of active agents, bioresorbable, and are usually targeted via aptamers (single strand DNA) to specific receptors on the surface of cancer cells and tumors. In murine animal models, our nanomedical formulations have been targeted for triple-negative breast cancer, chronic myeloid leukemia, human pancreatic cancer, and many more human cancers. We are expanding our portfolio of diseases to coronary artery disease, antibiotic-resistant bacteria, and SARS-CoV-2. In addition to therapeutic delivery systems, we also are focusing on early detection of human disease via a novel, targetable T1 MRI contrast nanoparticle agent and a near infra-red theranostic agent encapsulated in the CPSNPs for earlier detection and treatment of a wide variety of cancers and possibly other immune disorders