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Tumor-Targeted Killing with Aptamer-Nucleic Acid Nanostructures

Despite decades of research, cancer remains one of today's most pressing health concerns. Traditional treatment approaches such as radiation therapy and chemotherapy can cause systemic toxicity and become ineffective when resistant tumors emerge. Recently, anticancer strategies have focused on drugs which specifically target tumor-related biological molecules. Recognizing cancer cells and inducing apoptosis is a promising approach to tumor therapy.

Researchers at the Biodesign Institute of Arizona State University have developed a selection method for ligands to tumor cell-specific markers and death receptors on the tumor cell. The two ligands are screened from an aptamer library for high affinity and specificity to their targets. Multimeric structures of both aptamers are then synthesized and assembled to coordinate presentation to the cell and induce cell death.

Potential Applications

- Cancer diagnostic
- Anticancer therapeutic

Benefits and Advantages

- Lower systemic toxicity due to targeted delivery
- Assembly provides spatial organization of binding aptamers and increased avidity to target
- Scalable feature of the DNA-nanostructure platform makes it possible to incorporate additional biomolecules to enhance tumor-targeted killing

For more information about the inventor(s) and their research, please see [Dr. Yan's departmental webpage](#)[Dr. Yan's Laboratory webpage](#)[Dr. Chang's directory webpage](#) [Dr. Chang's departmental webpage](#)

