PURDUE INNOVATES | Office of Technology Commercialization

Selective Delivery of DNA Origami Nanostructures to Cancer Cells

Combination of Enzalutamide and ACAT1 inhibitor overcomes drug resistance in castration-resistant prostate cancer.

Pancreatic ductal adenocarcinoma (PDAC) poses a significant clinical challenge as shown by five-year survival rates of 13%. Researchers at Purdue University have developed a method by utilizing DNA Origami for selective imaging and targeted delivery of a therapeutic payload regarding KRAS-mutant pancreatic cancer cells. With this invention, anti-cancer agents can be included in the therapeutic payload via DNA Origami which can be selectively delivered to pancreatic cancer cells. This technology can also enable selective imaging such as carrying fluorescent species to the cancer cells in order to aid in medical diagnostics. With this invention, imaging and therapeutics regarding cancer cells can now have another great option.

Technology Validation:

This technology has been validated in the lab to demonstrate the ability of the DNA origami nanostructures enter pancreatic cancer cells without any functionalization of targeting ligands.

Advantages:

-Able to specifically target cancer cells

-Deliver nanoparticles selective to pancreatic cancer cells

Applications:

-Pancreatic cancer

-Potential other cancer cells

Publications:

DNA Walker-Regulated Cancer Cell Growth Inhibition

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Category

Materials Science & Nanotechnology/Nanomaterials & Nanostructures

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Pharmaceuticals/Drug Delivery & Formulations

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Chembiochem. 2016 Jun 16;17(12):1138-41. doi: 10.1002/cbic.201600052. Epub 2016 Apr 28. https://pubmed.ncbi.nlm.nih.gov/27059426/

Conformational Control of DNA Origami by DNA Oligomers, Intercalators and UV Light - PubMed (nih.gov)

https://pubmed.ncbi.nlm.nih.gov/34067324/

TRL: Pharmaceuticals

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Provisional-Gov. Funding, 2024-07-12, United States

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