

New Program Will Develop mRNA Tools for Cancer and Other Diseases

Biden's CUREIT initiative aims to develop a toolbox of technologies to fight cancer, autoimmune disorders and infectious diseases.

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The Biden Cancer Moonshot has announced a new program to develop generalizable mRNA tools that can be harnessed to train the immune system to more effectively fight cancer and other diseases, the administration [recently announced](#).

Biden's CUREIT (Curing the Uncurable via RNA-Encoded Immunogene Tuning) initiative will be led by a team at Emory University in Atlanta with up to \$24 million in new funding from the Advanced Research Projects Agency for Health (ARPA-H). As part of the president's Unity Agenda, ARPA-H was established last year to drive breakthroughs to prevent, detect and treat cancer and other diseases.

"At a time when most people thought bipartisan action wasn't possible anymore, we're proving that making progress on our toughest health challenges, like cancer, is something every American can get behind," [Biden said in a statement](#). "Today, we're taking an important step forward in achieving that ambitious goal, with a new ARPA-H program to use mRNA technology to train our own immune systems to fight cancer, autoimmune disorders and infectious diseases more effectively."

Messenger RNA (mRNA) was key to the development of effective COVID-19 vaccines. The technology also has the potential for wider application, including vaccines and other types of immunotherapy to treat cancer. mRNA vaccines use lipid nanoparticles to deliver bits of genetic material that carry instructions for specific proteins. For example, [mRNA COVID vaccines](#) deliver genetic blueprints for the SARS-CoV-2 spike protein. To create personalized cancer vaccines, scientists genetically sequence a patient's tumor and select neoantigens (abnormal proteins) that are most likely to stimulate the immune system. When injected into a muscle, the cells produce the proteins, triggering an immune response.

[As previously reported](#), two mRNA cancer vaccines are moving forward to the next stage of clinical trials after promising results in earlier studies. Modern and Merck recently announced the start of a Phase III trial testing an experimental melanoma vaccine, while BioNTech and Roche/Genentech have started a Phase II trial of a pancreatic cancer vaccine.

CUREIT aims to create a toolbox of mRNA and related technologies that could be used to turn on helpful immune responses or turn off harmful ones. Besides cancer vaccines, the technologies could also be used to develop immune-based therapies for infectious diseases and autoimmune disorders and to improve transplant outcomes. “A toolbox of mRNA platforms offers the potential to transform the fight against cancer and other difficult diseases,” according to the administration.

“By combining mRNA-encoded antigens with gene modulation technology, we will be able to radically enhance specific immune responses,” project leader Philip Santangelo, PhD, a professor at Emory and Georgia Tech, [said in a Georgia Tech news report](#).

“Many different therapies, including immunotherapies, have been very successful in many cases, but there have been deficiencies in how they function. What we’re trying to do is take that next step, which means targeting multiple cell types of different parts of the immune system and manipulating how those individual cells function,” he added. “I look at this as a life-altering opportunity to make huge steps that we wouldn’t be able to make otherwise.”

Click here to read Cancer Health features about [cancer vaccines](#) and [mRNA technology to fight cancer](#).