Moving forward with mRNA medicines

September 5 2018

In cells, ribosomes translate messenger RNA (mRNA) into proteins. And in the nascent field of mRNA therapeutics, researchers and investors are hoping to translate mRNA drugs from the lab to the medicine cabinet. Until now, the mRNA firm Moderna Therapeutics has been secretive about its technology, but now the company is opening up about its progress and challenges, reports an article in *Chemical & Engineering News* (*C&EN*), the weekly newsmagazine of the American Chemical Society.

Over the past five years, Moderna has spent an impressive $450 million on research into mRNA medicines and plans to spend another $500 million over the next five years, writes Assistant Editor Ryan Cross. Moderna and several other well-funded biotech firms are based on a seemingly simple principle: Introduce specially designed mRNA to certain cells of the body, and ribosomes will become miniature drug factories that churn out therapeutic proteins to treat almost any disease. However, the field has faced many hurdles, such as avoiding immune reactions, targeting specific cells, shuttling the mRNA safely inside and making enough protein to have an effect.

Moderna and other firms are addressing these challenges by optimizing the mRNA sequences and developing drug delivery mechanisms. For example, Moderna scientists have made lipid nanoparticles that deliver a special sequence of mRNA that causes cancer cells, but not normal cells, to self-destruct. Despite the promise of mRNA medicines, skeptics are quick to point out that Moderna has only published human data from one study, an early-stage trial on an mRNA flu vaccine. Companies must still

prove that mRNA medicines work in humans without side effects or complications, they say.

More information: "Can mRNA disrupt the drug industry?", cen.acs.org/business/start-ups … drug-industry/96/i35

Provided by American Chemical Society