

Our mRNA Investigational Therapy (VX-522)

Cystic fibrosis (CF) is a rare, genetic disease that affects the lungs. In people with CF, mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene cause the CFTR protein to become dysfunctional. When the protein is not working correctly, it is unable to help move chloride — a component of salt — to the cell surface. Without chloride to attract water to the cell surface, the mucus becomes thick and sticky, which may cause serious infections and eventually lead to severe lung damage.

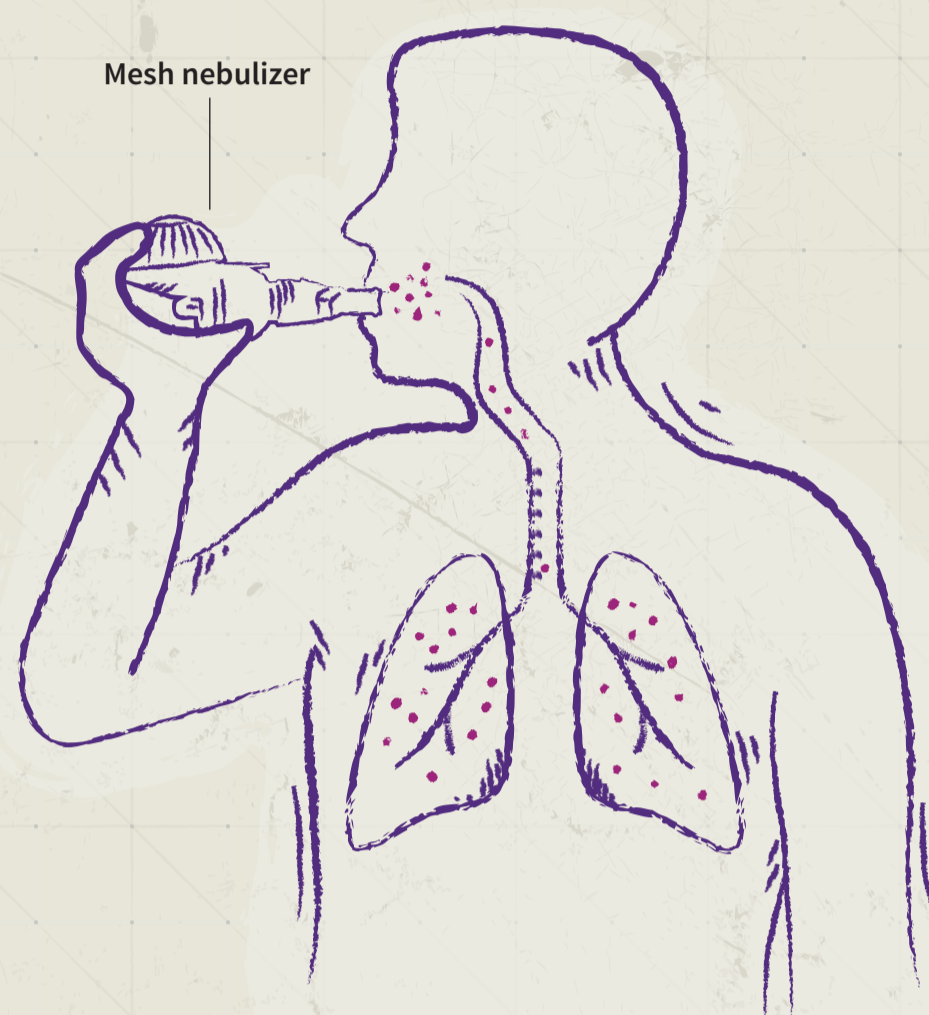
We are committed now more than ever in our pursuit to discover new therapeutic advances for all people living with CF. While about 90% of people living with CF make a defective CFTR protein and have the potential to benefit from current CF medicines, there are over 5,000 people who cannot produce a protein and therefore have no treatment options. This is why Vertex is working in partnership with Moderna on an investigational messenger ribonucleic acid (mRNA) therapy called VX-522 to address this unmet medical need.

The infographic below provides an outline of how we envision this investigational therapy to work and is provided for illustrative purposes only. The U.S. Food and Drug Administration has not made a determination on the safety and effectiveness of VX-522.

Step 1

Conceptually, the investigational mRNA-based therapy is inhaled so it goes directly into the lungs.

Mesh nebulizer – a device that turns liquid medicine into a mist



Step 2

After the mRNA enters the lungs, it travels to the cells that line the surface of the respiratory (breathing) tract.

Lipid Nanoparticle – a delivery vehicle that carries the genetic therapy to cells

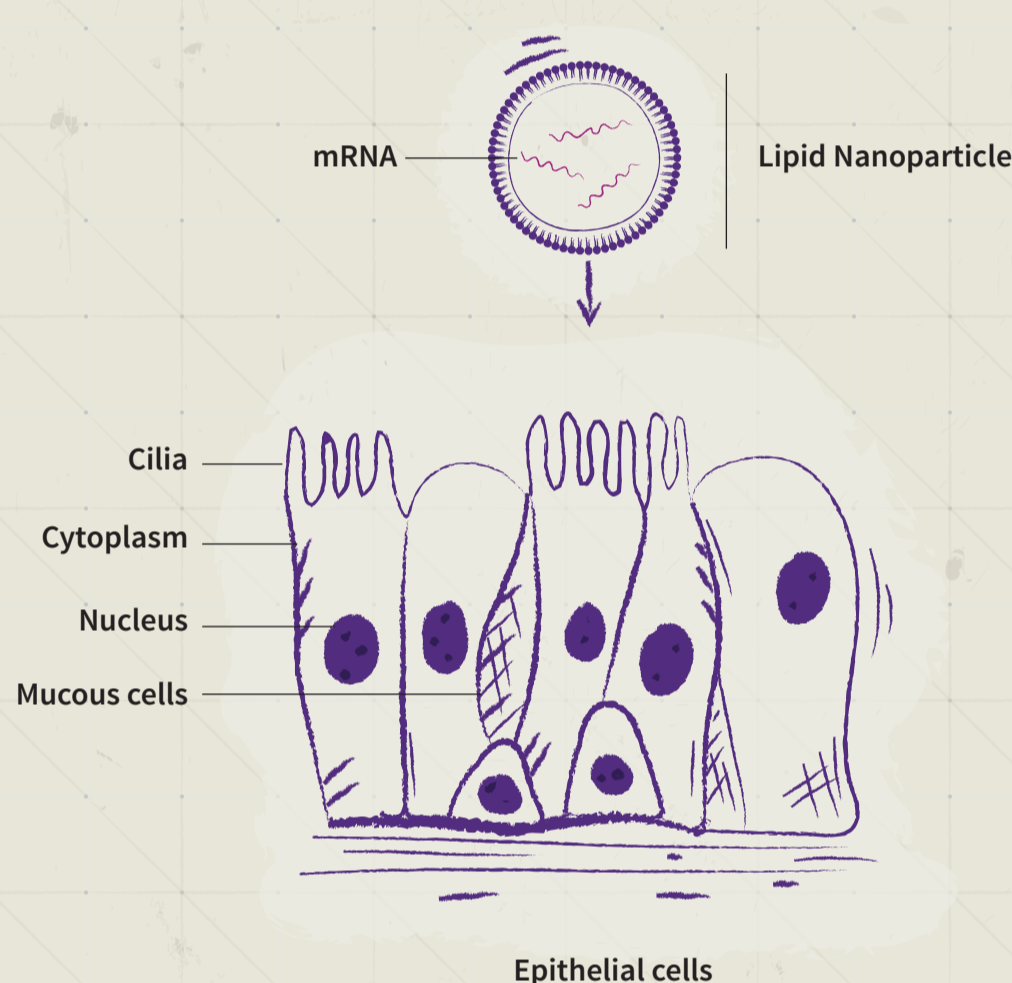
Cilia – hair-like structures on the surface of certain lung cells that help “sweep” mucus and debris out of the airway

Cytoplasm – jelly-like liquid that fills the inside of a cell

Nucleus – the control center of the cell that contains the cell’s genetic information

Mucous cells – line the surface of the lung and produce mucus, which traps and transports debris away from the airway

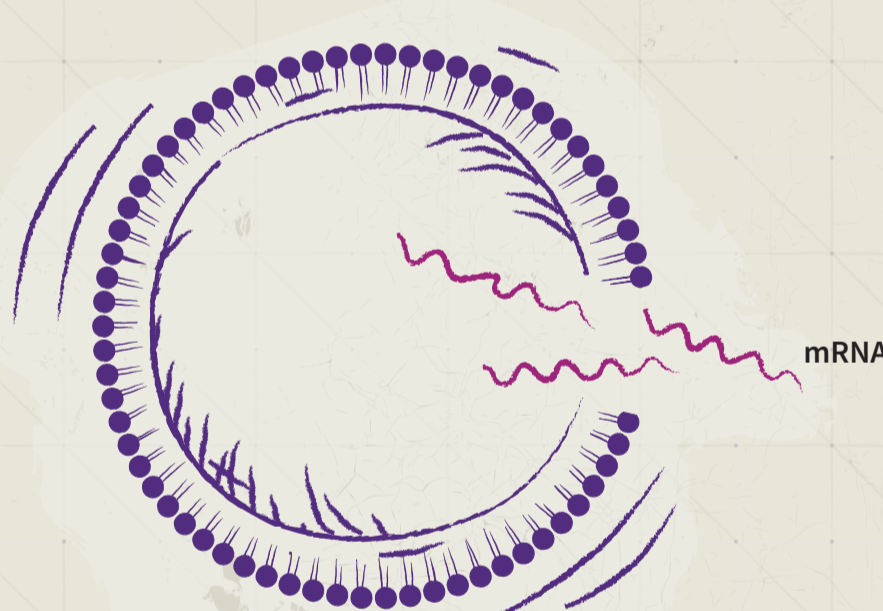
Epithelial cells – line the surface of the lung and serve as a protective barrier



Step 3

Conceptually, once inside each cell, the mRNA is released into the cell’s cytoplasm. At this point, the cell now theoretically has the instructions necessary to produce working copies of the CFTR protein.*

*It is not known if VX-522 affects cells in other parts of the body.



Step 4

The mRNA then tells the cell to produce working copies of the CFTR protein.



Step 5

After the CFTR proteins are created, they begin to do the job of the missing proteins. They travel to the cell’s surface where they begin to help the flow of water and salt into and out of the cell.

