



HOW HUMAN GENETICS DELIVERS HEALTH ADVANCES

Advances in federally funded genetics and genomics research are leading to new discoveries in preventing, diagnosing, and treating diseases—with much more to come. In this way, human genetics and genomics is providing hope for patients, families, and communities.

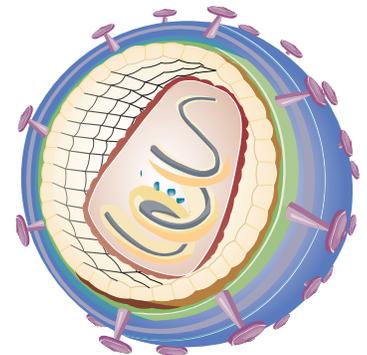
Infectious Diseases

Then: HIV

The first AIDS (acquired immunodeficiency syndrome) cases were reported in 1981. A few years later, researchers identified the human immunodeficiency virus (HIV) as the cause of the disease.¹ Since the first reported cases, HIV has remained a top global health concern.²

Now

Antiretroviral drugs have made it possible for most patients with HIV to live a normal lifespan with a lifelong course of medications.³ While new and improved antiretrovirals have been developed, the search for a cure remains. Scientists are now investigating whether a new gene-editing tool, known as the CRISPR system, can completely eliminate the virus by targeting the HIV DNA for removal from the body.⁴



Then: Antibiotic-Resistant Bacteria

Although antibiotics have saved millions of lives from infections, bacteria that are resistant to these life-saving drugs have been a concern since the 1940s.⁵ The World Health Organization (WHO) has declared it as one of the biggest threats to global health.⁶ In the U.S., almost 3 million antibiotic-resistant infections occur annually and threaten our most vulnerable patients in hospitals through healthcare-associated infections.⁷

Now

According to the most recent report by the Centers for Disease Control and Prevention, deaths from antibiotic-resistant infections in the U.S. have decreased in the past decade.⁸ Researchers have searched for new drugs and new strategies to treat bacterial infections, such as new vaccines to prevent infection and use of the CRISPR system to kill bacteria. Clinical trials are currently underway for the use of the gene-editing tool to treat antibiotic-resistant infections.⁹

“CRISPR gene-editing technology has tremendous potential for making non-heritable DNA changes that can treat or even cure a wide range of devastating disorders, from HIV to muscular dystrophy.”

—Francis Collins, NIH Director

Imagine

Advances in genetic-based technologies such as CRISPR, the gene-editing tool, offer new approaches and innovative strategies to treat infections and develop new vaccines for all infectious diseases.

References:
ashg.org/advocacy/fact-sheets/