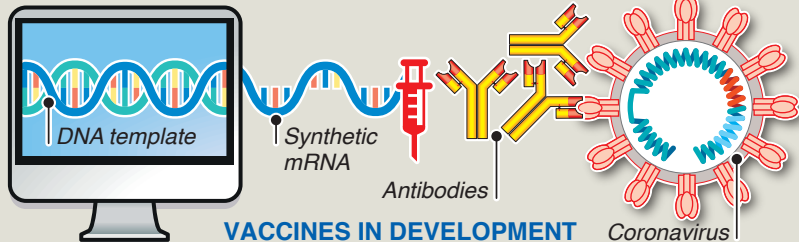


Race for a coronavirus vaccine

Large-scale clinical trials of an RNA coronavirus vaccine developed by U.S. drugmaker Pfizer and German partner BioNTech show the vaccine is more than 90% effective and has no serious safety concerns

RNA vaccine: Messenger RNA (mRNA) is made from DNA template in lab – mRNA contains recipe to produce antigen of virus

Antigen: Vaccine is injected – mRNA enters human cells and produces antigens which stimulate immune system to fight disease



■ **Preclinical testing:** Vaccine tested on cells and given to animals such as mice, hamsters or monkeys to see if it produces immune response

■ **Phase 1 trials:** Vaccine given to small group of people to test safety, dosage and confirm it stimulates immune system

■ **Phase 2 trials:** Vaccine given to hundreds of volunteers split into groups, for safety and immune system response

■ **Phase 3 trials:** Vaccine given to thousands of people. Tested for effectiveness and evidence of rare side effects missed in earlier studies

■ **Approval:** National regulators review trial results and decide whether to approve vaccine

87

87 preclinical vaccines in active development, including mRNA vaccine developed by French company **Sanofi** and U.S.-based **Translate Bio**

38

Vaccines in Phase 1, or combined Phase 1/2, include trials in 19 countries: Australia, Canada, China, Cuba, France, Germany, Hong Kong, India, Israel, Italy, Japan, Kazakhstan, North Korea, Russia, South Korea, Taiwan, Thailand, UK and U.S.

11

Phase 3 includes U.S. **Moderna** and **Pfizer-BioNTech** mRNA vaccines; Russia's **Gamaleya** and British **AstraZeneca** adenovirus vaccines

6

6

Six vaccines approved for limited use in China, Russia and United Arab Emirates