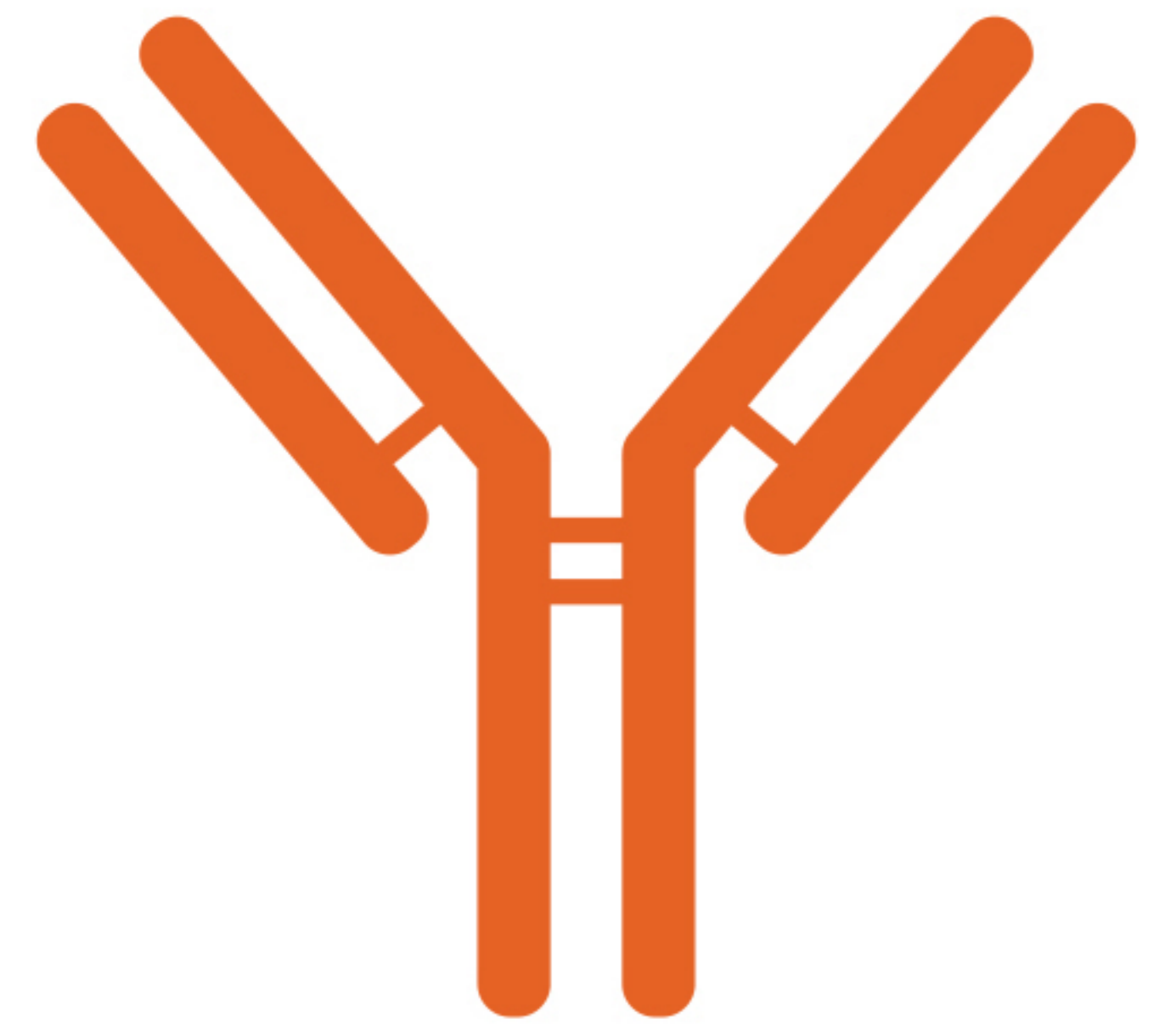


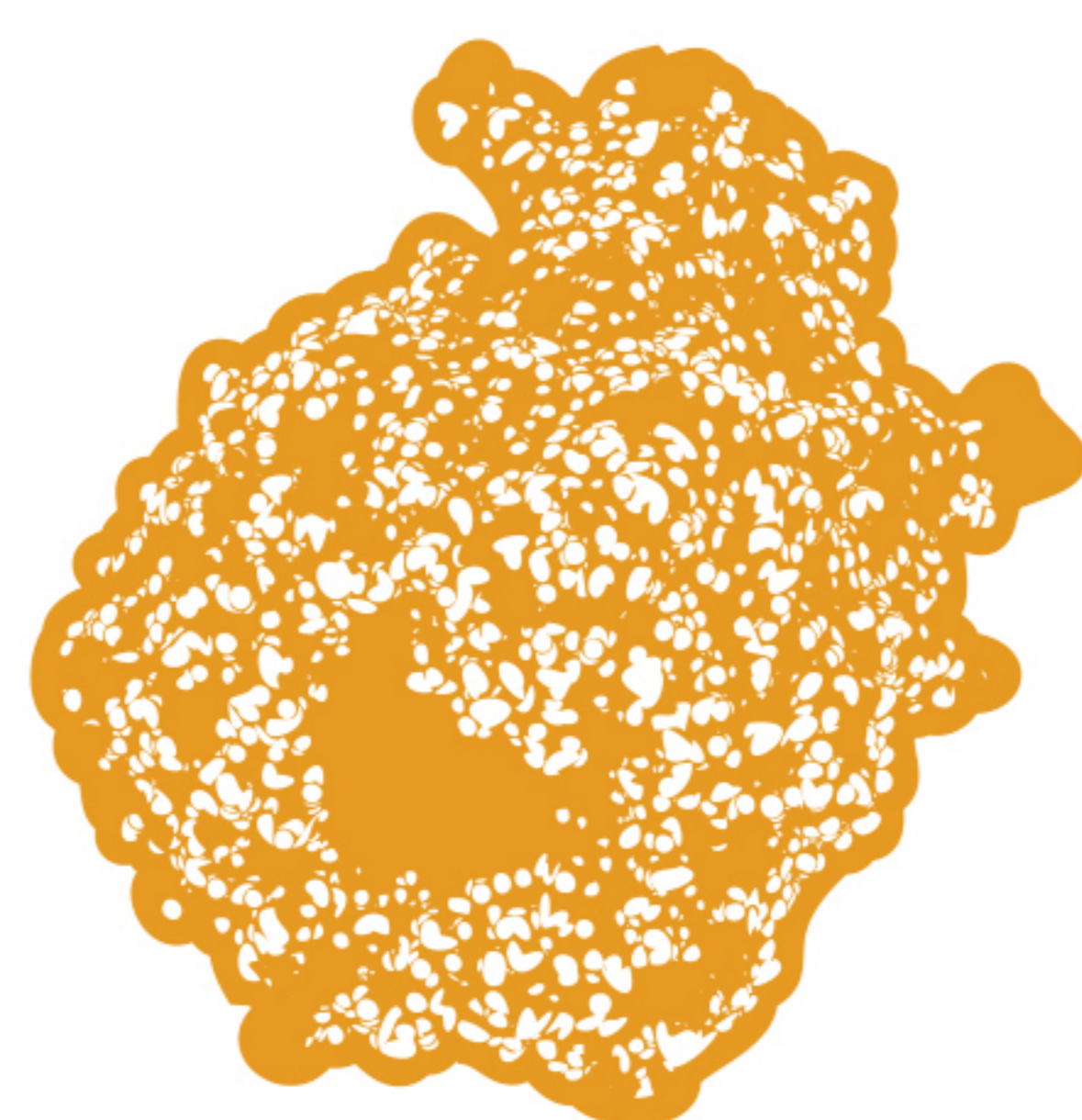
HIV Vaccine Approaches in COVID-19 Vaccine Development

Vaccine approaches originally developed for HIV vaccine design are at the forefront of COVID-19 vaccine development. There are over 100 vaccine candidates in development against COVID-19, many of the vaccines and approaches in human trials have roots in HIV research. Below are some of the approaches moving forward in human trials.



Antibodies

The AMP trials, with results due in October, are now testing infusions of an HIV-neutralizing antibody every two months as a prevention method. Antibody approaches like this, including convalescent plasma, and neutralizing antibody infusions and injections, are being developed for both prevention and treatment of COVID-19.



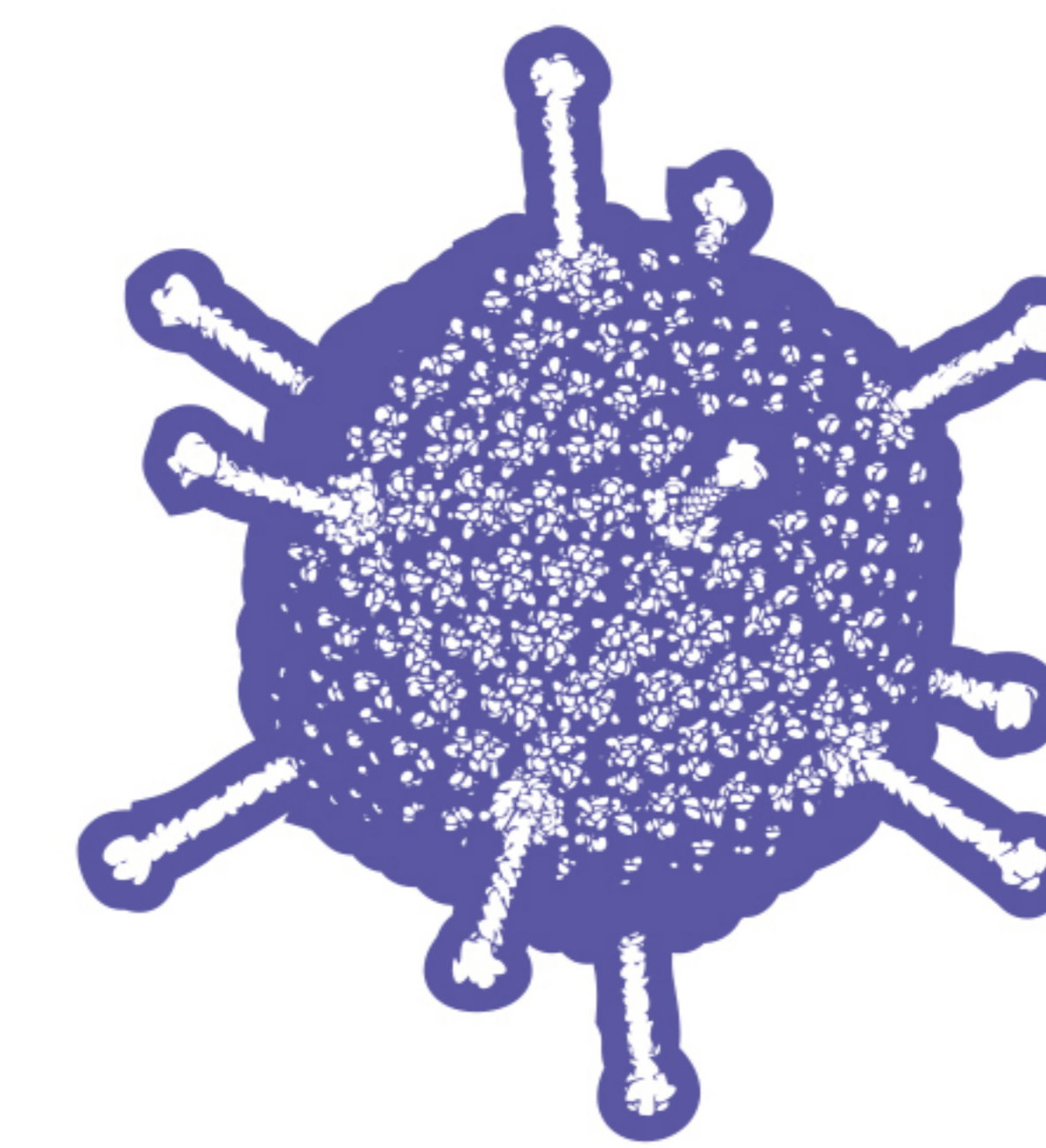
Chimp adenovirus vector

A vaccine developed at Oxford University from a virus that infects chimpanzees is being developed for therapeutic and preventive clinical trials against HIV and a number of other diseases. That chimpanzee virus platform has been adapted as a COVID-19 vaccine candidate and is now in clinical trials.



DNA

HIV vaccine approaches using a DNA platform are now being explored for COVID-19. Inovio has begun testing its DNA vaccine platform, originally developed for HIV vaccines, for use as a COVID-19 vaccine.



Human adenovirus vectors

Multiple adenovirus subtypes have been developed as HIV vaccine candidates, most notably, Janssen's Ad26 candidate, which is now in two large HIV vaccine efficacy trials. Janssen is now adapting its Ad26 as a COVID-19 vaccine. There are also several other adeno-based COVID-19 vaccines in development, such as the Ad5 adenovirus being tested by the Chinese military.



mRNA

Messenger RNA (mRNA) vaccines, potentially more potent than DNA platforms, have been developed as HIV vaccine candidates. Now, several mRNA vaccine candidates against COVID-19 are in clinical trials sponsored by Moderna, CureVac and Pfizer/BioNTech.