CASE STUDY

Institute for Research in Biomedicine

HUMABS BioMed
a subsidiary of Vir Biotechnology

HUMABS BIOMED – XEVUDY: SARS-COV-2 MONOCLONAL ANTIBODIES

Problem – Challenge

Severe acute respiratory syndrome Coronavirus-2 ("SARS-CoV-2") is a new strain of coronavirus not previously identified in humans, which led to the coronavirus outbreak of 2019. Whereas "COVID-19" is the disease associated with this virus. The spike protein located on the outside of a coronavirus is how SARS-CoV-2 enters human cells. The virus uses the spike protein to perform a viral entry into the host cell, a required early step in viral replication. However, its location on the outside of the virus also makes it an effective target for the immune system. Therefore, several biotech companies tried to develop monoclonal antibodies as treatments for COVID-19, but only very few have shown to be successful.

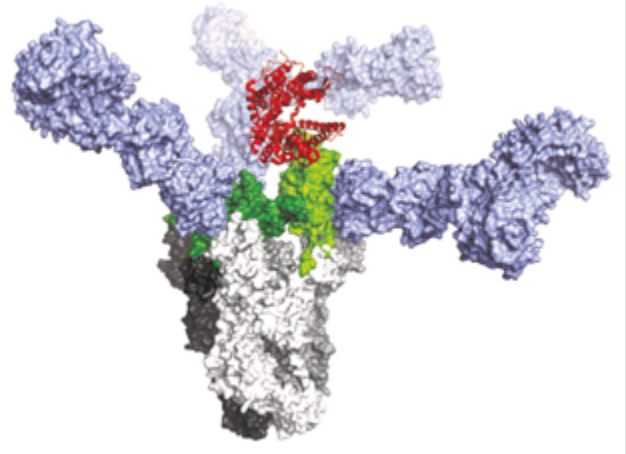
Solution

Humabs BioMed originally a Spin-off of the Institute for Research in Biomedicine (IRB – affiliated to the Università della Svizzera italiana), in Bellinzona, has later been acquired by Vir Biotechnology. Founded in 2004, Humabs operates in the field of immunology by identifying and producing monoclonal antibodies from human blood (mAbs) also thanks to a patent protected technology invented by Prof. Antonio Lanzavecchia at the IRB and exclusively licensed to Humabs. These antibodies are isolated and processed to attack and neutralize viruses, bacteria or molecules that are the source of infectious diseases.

With the COVID-19 outbreak Humabs was able to identify antibodies effective against both SARS-CoV-1 and SARS-CoV-2. The company isolated antibodies targeting highly conserved sequences and therefore more likely to remain effective against future variants of SARS-CoV-2. After a series of trials, Humabs scientists eventually settled on a single candidate antibody, and by collaborating with GlaxoSmithKline (GSK) developed the monoclonal antibody Sotrovimab.

Sotrovimab, sold under the brand name Xevudy, is a human neutralizing monoclonal antibody with activity against SARS-CoV-2. When Sotrovimab binds to the spike protein, the virus is unable to enter the body's cells. This antibody effectively stops the virus from replicating and prevents a potential hospitalization for the patient.

Sotrovimab is now approved in the European Union and in several other countries for the treatment of adults and adolescents with COVID-19 and it has been administered to patients worldwide.



Sotrovimab on Spike
purple: full IgG1 model of Sotrovimab
red: ACE2
grey: SARS-CoV-2 spike monomers of the trimer
dark green: closed RBD (Receptor-Binding Domain)
light green: open RBD