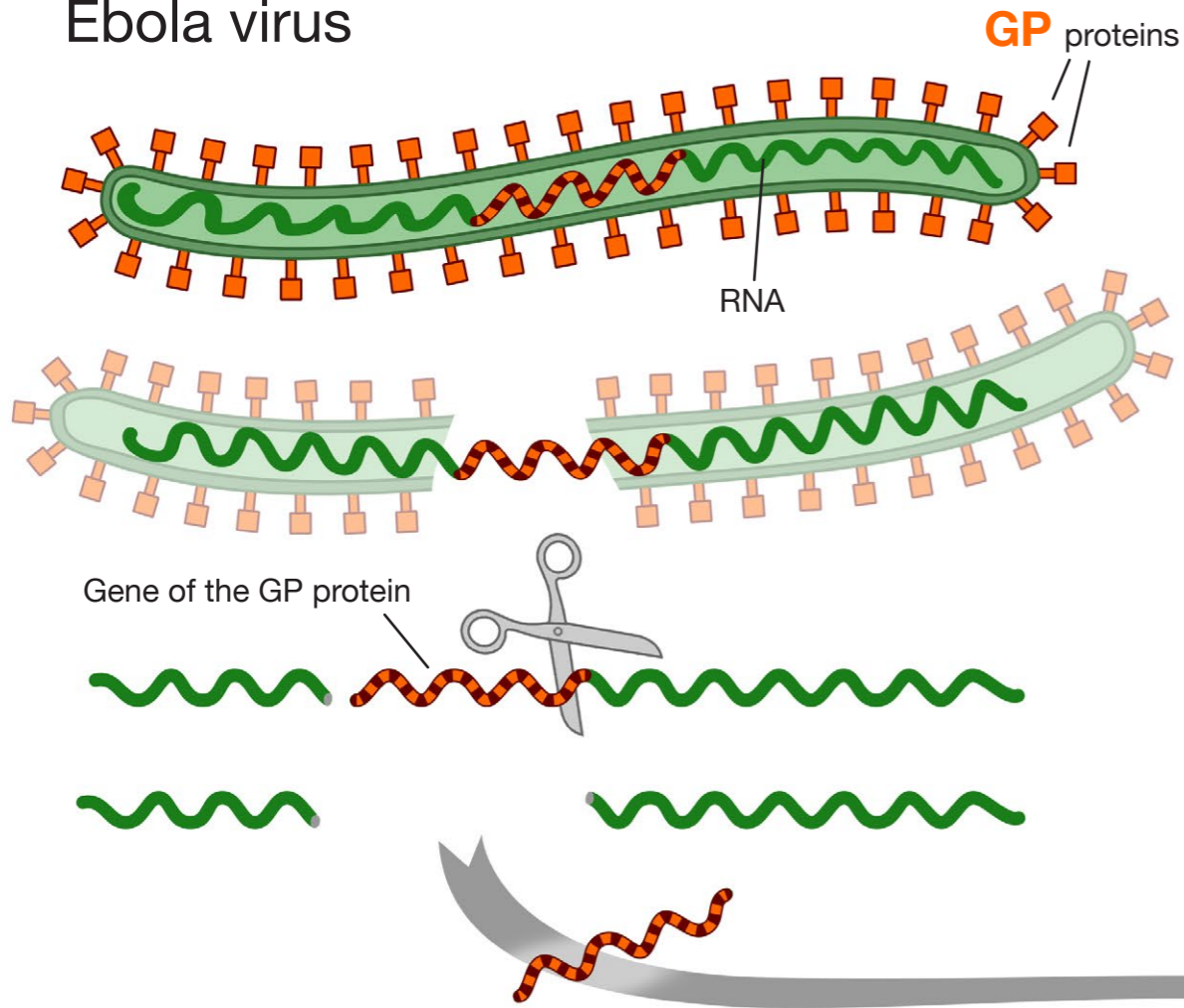
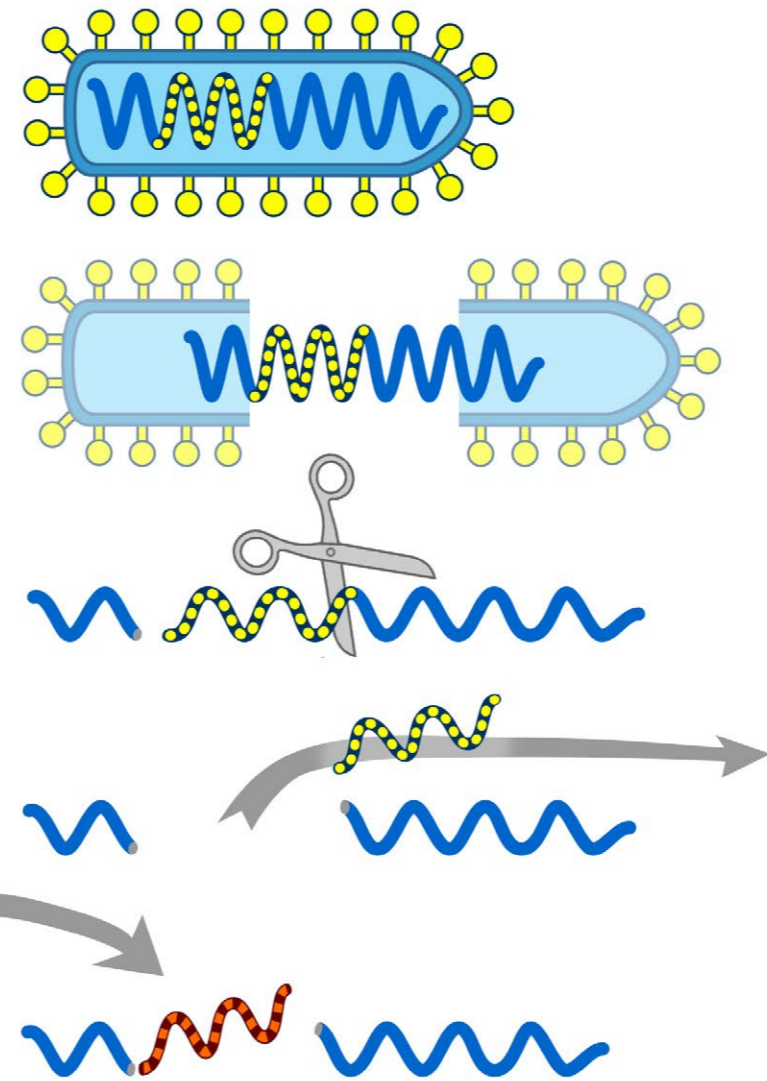


# Ebola virus



# Vesicular stomatitis virus (VSV)



## VSV-Ebola vaccine (VSV-ZEBOV) against Ebola virus

The current Ebola outbreak is caused by the “Zaire” type of the virus. Ebola virus attacks human cells by attaching to them with an anchor protein (GP) covering the surface of the virus. It then enters the cells and forces them to produce new viruses. The GP protein is then massively produced by infected cells and enters the bloodstream, where it is toxic to the blood vessels’ walls, causing the bleeding and hemorrhages which are the hallmark of the disease.

To be protected against the Ebola virus, a person must produce antibodies that neutralize the GP protein. This requires the body to come into contact with GP protein, but without the risk of developing the disease. This is precisely the role of the VSV-Ebola vaccine. The idea is to bring the GP protein into the bloodstream, but carried by another virus – the vesicular stomatitis virus (VSV) – selected for its ability to stimulate the immune system of a person, without becoming life-threatening. Known for infecting cattle, in humans the VSV virus causes symptoms no worse than those of a flu.

To make the vaccine, Canadian researchers took the gene of the GP protein from the Ebola virus and transferred it into the VSV virus (thus replacing the VSV surface protein gene). They also weakened the VSV virus to make it even safer for humans.

The VSV-Ebola vaccine therefore contains the vesicular stomatitis virus, whose envelope protein has been replaced by the GP protein belonging to the Ebola virus (Zaire type). The vaccine does not contain any other molecules belonging to the Ebola virus: thus, there is no risk of catching Ebola disease through vaccination.

The laboratory experiments on monkeys showed that a single injection of the VSV-Ebola vaccine is sufficient to trigger the production of large quantities of anti-GP antibodies, and to protect them against lethal doses of Ebola virus. If everything works out as expected, vaccinated individuals will also produce GP antibodies that will protect them in the event of an exposure to Ebola virus.

