Ebola virus (EBOV, formerly Zaire ebolavirus) causes severe disease in humans and in nonhuman primates in the form of viral hemorrhagic fever. The virus is a virological taxon included in the genus Ebolavirus, family Filoviridae, order Mononegavirales. The species has a single virus member, Ebolavirus species Zaire (ZEBOV) causing hemorrhagic fever, resulting in the death of ~90% of patients within days. Most information on immune responses to ZEBOV comes from in vitro studies and animal models. Ebola Zaire attacks every organ and tissue in the human body except skeletal muscle and bone. Ebola is classified as a Level 4 pathogen (higher than AIDS) with a 2 to 21 day (7 to 14 days average) incubation period. There are currently five known strains of Ebola: Bundibugyo, Zaire, Sudan, Reston and Tai. All cause illness in nonhuman primates. Only Ebola Reston does not cause illness in humans. The mortality rate of Ebola victims is between 60% and 90%; with Ebola Sudan at 60% and Ebola Zaire at 90%.

The virions are tubular in general form but variable in overall shape and may appear as the classic shepherd's crook or eyebolt. Ebola virions consist of 7 structural proteins. At the center is the ribonucleoprotein (NP) which consists of the genomic RNA wrapped around a polymer of nucleoproteins (NP). Associated with the ribonucleoprotein is the RNA-dependent RNA polymerase (L) with the polymerase cofactor (VP35) and a transcription activator (VP30). The ribonucleoprotein is embedded in a matrix, formed by the major (VP40) and minor (VP24) matrix proteins. They are surrounded by a lipid membrane derived from the host cell membrane. The membrane anchors a glycoprotein (GP1,2) that projects 7 to 10 nm spikes away from its surface. While nearly identical to Marburg virions in structure, Ebola virions are antigenically distinct.

The most common diagnostic methods are RT-PCR in conjunction with the classic ELISA. Antibodies and vaccine-induced immune responses to ZEBOV come from in vitro studies and animal models. Ebola Zaire attacks every organ and tissue in the human body except skeletal muscle and bone. Ebola is classified as a Level 4 pathogen (higher than AIDS) with a 2 to 21 day (7 to 14 days average) incubation period. There are currently five known strains of Ebola: Bundibugyo, Zaire, Sudan, Reston and Tai. All cause illness in nonhuman primates. Only Ebola Reston does not cause illness in humans. The mortality rate of Ebola victims is between 60% and 90%; with Ebola Sudan at 60% and Ebola Zaire at 90%.

The most promising ones are DNA vaccines or are based on adenoviruses, vesicular stomatitis Indiana virus (VSIV) or filovirus-like particles (VLPs) and recombinant Marburg glycoprotein (MARV GP) and free GP2 subunit. No cross reactivity to Sudan Ebolavirus (SEBOV) GP, Zaire Ebolavirus (ZEBOV) GP was observed. Antibodies and recombinant gp proteins from various Ebola and Marburg viruses are available for control studies.