Ebola is a rare and deadly disease caused by infection with a strain of Ebola virus (Zaire, Sudan or Marburg). Ebola is spread through direct contact with body fluids of infected patients. The recent Ebola outbreak affected multiple countries in West Africa and clearly demonstrated a need for development of technologies enabling production of adequate supply of vaccines and therapeutics to treat infected patients. We have undertaken efforts to develop methods and produce plant-based recombinant vaccine as well as a series of monoclonal antibodies to fight Ebola infection.

Several approaches were carried out to develop vaccines based on recombinant soluble E-protein and on enveloped or non-enveloped (CP-based) virus-like particles. Preliminary results demonstrating challenges and opportunities for further development of plant-expressed Ebola vaccines will be discussed.

In parallel efforts, we have developed a robust plant-based expression platform for expression of monoclonal antibodies against Zaire and Sudan strain of Ebola. We established and optimized expression system and process for rapid production of these antibodies in quantities sufficient to enable pre-clinical evaluation and stability studies. Initial characterization of selected Ebola antibodies will be presented.