



Plant-derived Antibodies and Their Derivatives as Safer Therapeutics for Viruses

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Invention Description

One of the major obstacles in developing vaccines and antibody-based therapeutics for many viruses is the risk of antibody-dependent enhancement (ADE), which may render treated subjects more susceptible to infection. Recent research indicates that antibody glycosylation plays an important role in ADE. Using aglycosylated monoclonal antibodies (MAbs) can reduce the occurrence of ADE; however, they are less stable and may lose the necessary effector function required to realize their full therapeutic effect. Thus a need exists for antibody based therapeutics that are effective but do not cause ADE.

Researchers at the Biodesign Institute of Arizona State University have developed plant lines that produce antibodies with a defined glycoform. This allows for the selection of antibodies with glycoforms which reduce or eliminate ADE while maintaining high therapeutic potency. Several anti-West Nile virus and anti-Dengue virus MAbs have already been developed that retain full therapeutic potency while reducing or eliminating ADE. Moreover, these plants could be used to create other MAbs and their derivatives to treat other flaviviruses, coronaviruses, paramyxoviruses, lentiviruses or any other viruses that are prone to ADE.

This technology significantly reduces the risk of ADE and enhances the safety profile of a broad range of monoclonal antibodies for viral infections.

Potential Applications

- Antibodies & derivatives production in plants
 - Anti-West Nile virus antibodies & derivatives
 - Anti-Dengue virus antibodies & derivatives
 - Anti-flavivirus, coronavirus, paramyxovirus, lentivirus, etc. antibodies & derivatives

Benefits and Advantages

- Enhanced safety profile of a broad range of antiviral antibody based drugs
- MAbs can be produced with highly defined and uniform glycoforms for selection of ADE reducing candidates
- The MAbs are stable and retain their full therapeutic function and potency