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Immunotherapy from plants

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Plants are recently being used worldwide as bioreactors for generating many therapeutics. The expression of plantibodies has opened a new era in plant biology research. The plantibodies are antibodies synthesised by plants that are genetically engineered with animal DNA encoding a specific human antibody that neutralises a particular pathogen. Researchers have always tried to find ways to exploit plants to produce pharmaceutically important antibodies. At present, health has become one of the key aspects of one’s life. As a result of poor immunity, human beings are susceptible to several diseases. Therefore, antibodies that play an essential part in vertebrates' adaptive immune systems could be utilised for treatment; they can now be produced by transforming plants with antibody-coding genes from mammals or humans. Plantibodies could overcome the problem faced by conventional techniques as they are cost-effective comparatively. Antibodies are incorporated into the plants using transformation or plant tissue culture techniques. The transformation could be achieved through Agrobacterium and particle bombardment to incorporate the desired genes within the plant cells. Besides low cost, plantibodies are safe and effective, and their high yield could be obtained through crops. The plantibodies could be incorporated into humans to deliver pathogen-resistance property. An example of plantibody includes CaroRX produced in tobacco plant against Streptococcus surface antigen. One major application of the production of plantibody is disease resistance. To treat a disease, it is optimum for a certain dosage of antibodies to be synthesised or artificially injected to counteract the foreign antigens. Hence, plantibodies can be produced on a large scale to treat various immune disorders, cancers and inflammatory diseases. Indeed, they could act as an alternative production system to meet the demand for vaccine production in the future.

Keywords: Plantibody, Transformation, Agrobacterium, Diseases, Resistance against diseases, Plants, Antibodies

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