



Review article

Transgenic carrot plant-made edible vaccines against human infectious diseases

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Abstract

Infectious diseases are becoming a severe public health problem in every part of the world. In response to this, transgenic plants have turned into a new noticeable platform for the production of edible biopharmaceutical proteins, which will be evaluated for their efficiency as edible vaccines to protect against various infectious diseases in humans. Carrot is one plant species that has been used for producing biopharmaceutical proteins. Adjuvants to improve the immune response and bioencapsulation to provide a system for delivering antigens in a way that protects them from the low pH and enzyme digestion inside the gastrointestinal tract have also been developed. The use of transgenic carrot to express the target antigens has been a promising for the production of edible vaccines, because it consists of immunodominant epitopes. The edible vaccines developed so far using carrot could have a crucial role in protecting against various infectious diseases along with the potential to induce both systemic and mucosal immune responses in a mouse model. Herein, we summarize the progress of carrot-based expression systems that have been evaluated for edible vaccine development in the last five years.