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## Recent developments in edible vaccines

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In the field of novel strategies for vaccines development with a promising route for noninvasive administration, the concept of using plants for vaccine expression and delivery has been receiving considerable scientific attention. Over the past years, this unique challenge has almost created the impressive list of different antigens expressed in transgenic plants and plant cell culture systems. Thus, for example, transgenic plant-derived vaccinogens includes hepatitis antigen in potatoes and a lettuce, a rabies antigen in tomato and E. coli heat-labile enterotoxin in corn. Moreover, carrots, maize, banana and other food plant-based production systems have been involved in the development of edible vaccines. As acknowledged, the first human clinical trials for a transgenic, plant-derived antigen were approved (Food and Drug A) and performed in 1997. It is reported that delivery of a plant-derived vaccine to a mucosal tissue induces both a mucosal and a systemic immune response. The recent advances achieved in this field with long-term potential addressing dosage, best delivery method, strength as well as advantages and current limitations are demonstrated and evaluated.

**Key words:** edible vaccines, advantages and limitations

## Biography

Renata Slaveska Raichki is a pharmacist and full Professor in Pharmaceutical Technology and Biotechnology at the Faculty of Pharmacy, Ss. Cyril and Methodius University in Skopje, Macedonia. She completed MSc degree at the University of Zagreb in 1990, health specialization in 1995 and PhD degree at the Ss. Cyril and Methodius University in 2001. Her research interests focus on mass transfer, method development and experimental design. She published more than fifty papers in domestic and foreign scientific journals; participated at more than thirty scientific and professional meetings in the country and abroad. She was involved in many domestic and international scientific projects in the field of natural product and drug science.

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