FOOD VACCINES

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Introduction. Vaccination is the most effective and economical way to protect the organism against infectious diseases. Most infectious agents enter the body through the mucous membranes of the digestive, respiratory and urogenital systems. To effectively protect the mucous membranes, mucosal immunization is needed.

Aim. To analyze the prospects of the use of edible vaccines in the prevention of infectious diseases.

Results and discussion. The advantages of mucosal protection include: improved efficiency, simpler administration of the drug, reducing the risk of contamination by other microorganisms compared to injection or other methods that violate the skin. However, mucosal protective physiological mechanisms have removed any surface antigens from their own, including the participation of enzymes. How to overcome this barrier and deliver the antigen to the destination? Traditionally, this is done using the packaging - biodegradable polymeric or lipid particles, which are often administered orally or intranasally. Another more modern approach is to obtain transgenic plants which produce protective antigenic proteins of infectious agents, and their use as edible vaccines. What are the advantages of this approach? Plant cell walls effectively protect the antigen present in them after entering the human oral cavity, swallowing, and subsequent passage through the stomach. "Packaged" in a manner, antigen safely reaches the intestine, where it appears to the mucosal immune system. An important feature of edible vaccines is their potentially low cost. Other attractive properties include biological safety (in which there are no viral and other human and animal pathogens), ease of storage and use. Moreover, it is possible to create plants simultaneously producing several protective antigens of various pathogens, which in practice means the appearance of edible multivalent vaccines.

Conclusions. Currently, many world laboratories working on similar vaccines have already developed such candidate vaccines based on transgenic plants: HIV-AIDS, hepatitis B. Another research group prepared tobacco and potato plants that synthesize immunoglobulin A - C, enterotoxin, cholera toxin, surface antigen of hepatitis B. Protein produced by transgenic plants have the same antigenic and physiological properties as the protein derived from animal cells. A promising area is developed in recent years, projects of creation of so-called therapeutic vaccines against papillomaviruses. Currently, we discussed the prospect of "edible" vaccines against tuberculosis based on transgenic plants.