Papillomaviruses are causing various diseases from skin warts to the lesions leading to malignant tumours and are widespread among people. For this reason, the current research is trying to develop methods for the production of inexpensive and effective vaccines against both Papillomaviruses and against all other infectious diseases. Currently animal and microbial expression systems are most frequently used for the production of biopharmaceuticals which have several drawbacks and their capacity is limited. This opens up the doors for plants - potentially very efficient producers of biopharmaceuticals. Currently there is rapid development towards the optimization and improvement of the results of plant expression systems and establishing the best and safest methods of their use.
This paper summarizes and compares the advantages and disadvantages of different methods of plant transformation, leading either to stable production of the protein of interest in transgenic plants or to transient expression of recombinant virus infecting non-transgenic plants. Furthermore it analyzes the most appropriate plant species, which provide high yields combined with a transformation method and ease of cultivation, describes few basic ways of optimizing expression levels and outlines the future of plant expression systems.