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Development of "deconstructed virus" vector based on grapevine virus A

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The use of viral vectors for production of heterologous proteins in plants is main strategy in obtaining vaccine, antibodies and different proteins for medicine. The main task in the development of vector is a creation of vector with stable high yield expression of the target gene. For creation of this viral vector we used Grapevine Virus A (GVA). GVA is responsible for considerable crop losses. GVA (a Vitivirus) is associated with the Kober Stem Grooving disease. Viral genome is positive RNA with 5 open reading frames (ORF). PCASS vector carrying the complete genome of the Grapevine Virus A (pCASSgva) was used for creation of a viral vector based on GVA. The viral genome was modified by introducing a cassette carrying reporter gene (*egfp*) flanked by 2A self-cleaving peptides within restriction sites XmaI and XbaI between ORF 3 and ORF 5 with deletion of ORF4 (CP). The *egfp* gene was under the control of the CP subgenomic promoter and fused with ORF5. The modified viral genome was subcloned into a pCambia binary vector. The expression of the *egfp* in agroinfiltrated *N. benthamiana* leaves after 3-4 days of infection was confirmed by using fluorescent microscopy. Furthermore, the movement of modified virus in transgenic *N. benthamiana* carrying the capsid protein gene was observed. The expression level of the viral vector and its usefulness as a vector for the expression of avian influenza hemagglutinin will be further investigated.

Biography

Dilyara A Gritsenko is a PhD student at Kazakh National University named after Al-Farabi. She performs her Diploma work at Institute of Plant Biology and Biotechnology. The title of diploma is "Development of viral vector for heterologous protein expression in plants". She has developed 2 vectors based on genome of Grapevine Virus A (GVA) by using main strategies for vector engineering such as "deconstructed virus" and "full virus". Currently, these vectors were investigated for successful expression of *egfp* and coat protein of Apple chlorotic leafspot virus. Moreover, she developed transgenic plants carrying coat protein of GVA for increasing of target protein yield since GVA cannot move between cells in non-encapsidated form.

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