



**VIRUS-INDUCED GENE SILENCING (VIGS) SILENCING OF NBPM1 IN
*NICOTIANA BENTHAMIANA***

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Virus-induced gene silencing (VIGS) is a robust technology that exploits an antiviral defense mechanism in plants as a tool for plant reverse genetics. VIGS circumvents the need for plant transformation and methodologically is simple and yields rapid results [1]. *Nicotiana benthamiana* is one of the important species of solanaceae family. The solanaceae plants produce a variety of interesting biologically active products such as nicotine and tropane alkaloids [2]. Putrescine N-methyltransferase (PMT) is an enzyme that catalyses S-adenosylmethionine-dependent methylation of putrescine in one of the primary steps of nicotine and tropane alkaloids biosynthesis pathway [3]. In this study, a 450 bp fragment of the *NbPMT* gene was cloned into the TRV1 vector and was transferred into the plant using *Agrobacterium tumefaciens*. The expression pattern of *NbPMT*, was studied. Concentrations of nicotine were examined by HPLC analysis. Results showed that nicotine level compared with the mock treatment, increased in the control group and decreased in the *NbPMT* gene silenced plants which means the efficiency and robustness of VIGS technique to investigate the PMT function in *N. benthamiana*.

References

- [1] Purkayastha, A.; Dasgupta, I. *Plant Physiology and Biochemistry*, 2009, 47, 967-976.
- [2] De Luca, V.; Pierre, B. *Trends in Plant Science*, 2000, 5, 168-173.
- [3] Biastoff, S.; Reinhardt N.; Rava V.; Brandt W.; Dräger B. *FEBS Letters*, 2009, 583, 3367-3374.