

## Accepted Manuscript

Title: Profiling of small RNAs derived from cucumber mosaic virus in infected *Nicotiana benthamiana* plants by deep sequencing

Authors: Yanhong Qiu, Yuping Wu, Yongjiang Zhang, Wenjie Xu, Chenguang Wang, Shuifang Zhu



PII: S0168-1702(18)30091-1  
DOI: <https://doi.org/10.1016/j.virusres.2018.05.013>  
Reference: VIRUS 97405

To appear in: *Virus Research*

Received date: 9-2-2018  
Revised date: 10-5-2018  
Accepted date: 11-5-2018

Please cite this article as: Qiu Y, Wu Y, Zhang Y, Xu W, Wang C, Zhu S, Profiling of small RNAs derived from cucumber mosaic virus in infected *Nicotiana benthamiana* plants by deep sequencing, *Virus Research* (2010), <https://doi.org/10.1016/j.virusres.2018.05.013>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Profiling of small RNAs derived from cucumber mosaic virus in infected *Nicotiana benthamiana*  
plants by deep sequencing

Yanhong Qiu<sup>a</sup>, Yuping Wu<sup>a</sup>, Yongjiang Zhang<sup>a</sup>, Wenjie Xu<sup>a, b</sup>, Chenguang Wang<sup>a</sup>, Shuifang Zhu<sup>a, \*</sup>

<sup>a</sup> Chinese Academy of Inspection and Quarantine, Ronghua South Street No. 11, Beijing 100176, China

<sup>b</sup> China Agricultural University, Yuanmingyuan West Street No. 2, Beijing 100193, China

Corresponding authors:

Zhu SF (e-mail: 443669663@qq.com)

### Highlights

- The profile of vsRNAs was characterized in CMV-m2b infected *Nicotiana benthamiana*.
- The NbRDR6 was confirmed to enhance the antiviral defense by amplifying vsRNAs.
- The NbAGO proteins bind different vsRNAs to promote the antiviral silencing.

### ABSTRACT

In plants, RNA silencing is a conserved mechanism underlying antiviral immunity. To investigate antiviral responses in *Nicotiana benthamiana*, we analyzed the profiles of the virus-derived small RNAs (vsRNAs) in wild-type *N. benthamiana* and *NbRDR6* mutant plants infected with the cucumber mosaic virus (CMV) 2b-deficient mutant. We observed that NbRDR6 regulates RNA silencing by producing vsRNAs that trigger an effective antiviral response, while NbRDR1 may nonredundantly and synergistically function with NbRDR6 to mediate immune responses. The vsRNAs in *N. benthamiana* and *NbRDR6* mutant plants mainly comprised 21 or 22 nucleotides, and mostly consisted of a 5'-terminal adenine. Additionally, *NbAGO2* expression was significantly up-regulated in *N. benthamiana* and *NbRDR6* mutant plants, suggesting that NbAGO2 is closely associated with the antiviral activities of vsRNAs. The distribution of vsRNAs in the CMV genome was biased toward RNA sense strands in both *N. benthamiana* and *NbRDR6* mutant plants. These findings indicate the specific and conserved antiviral immunity in *Nicotiana benthamiana*.

Download English Version:

<https://daneshyari.com/en/article/8751735>

Download Persian Version:

<https://daneshyari.com/article/8751735>

[Daneshyari.com](https://daneshyari.com)