



Title: Nicomics, a user friendly bioinformatic server for high quality Nicotiana reference genomes

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Nicotiana tabacum and *Nicotiana benthamiana* are widely used models in plant biology research. However, genomic studies of these species have lagged. Recently, we report the chromosome-level reference genome assemblies for *N. benthamiana* and *N. tabacum* with an estimated 99.5% and 99.8% completeness, respectively [1]. Sensitive transcription start and termination site sequencing methods were developed and used for accurate gene annotation in *N. tabacum*. Comparative analyses revealed evidence for the parental origins and chromosome structural changes, leading to hybrid genome formation of each species. Interestingly, the antiviral silencing genes RDR1, RDR6, DCL2, DCL3, and AGO2 were lost from one or both subgenomes in *N. benthamiana*, while both homeologs were kept in *N. tabacum*. Furthermore, the *N. benthamiana* genome encodes fewer immune receptors and signaling components than that of *N. tabacum*. These findings uncover possible reasons underlying the hypersusceptible nature of *N. benthamiana*. We developed the user-friendly Nicomics web server (<http://lifenglab.hzau.edu.cn/Nicomics/>) to facilitate better use of *Nicotiana* genomic resources as well as gene structure and expression analyses. Updates on the Nicomics server will be discussed to accommodate other recently published high quality *nicotiana* genomes.

References

1. Wang, J., et al., *High-quality assembled and annotated genomes of Nicotiana tabacum and Nicotiana benthamiana reveal chromosome evolution and changes in defense arsenals*. *Molecular Plant*, 2024. **17**(3): p. 423-437.

Biography

Dr. Li Feng completed his BS and PhD from Tsinghua University and University of California Riverside, respectively and postdoctoral studies from University of California Berkeley. He is a Professor at the College of Horticulture and Forestry Sciences in Huazhong Agricultural University. His research is focusing on plant genomics and plant-pathogen interaction. He has published more 50 papers in reputed journals and serves as an editorial board member of Horticultural Plant Journal.

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