Volume 16 Number 20 1988 Nucleic Acids Research

Isolation and nucleotide sequence of cDNA clones for the pathogenesis-related proteins PR1a, PR1b and PR1c of *Nicotiana tabacum* cv. Xanthi nc induced by TMV infection

John R.Cutt, Dave C.Dixon, John P.Carr and Daniel F.Klessig

The Waksman Institute at Rutgers, State University of New Jersey, PO Box 759, Piscataway, NJ 08855, USA
Submitted September 14, 1988 Accession nos X12485–X12487 (incl.)

The PR1 family of pathogenensis-related proteins from tobacco is induced by a variety of pathogenic and chemical agents and is associated with resistance to tobacco mosaic virus. We have isolated cDNA clones for the PR1a,b, and c mRNAs of *N.t.* cv. Xanthi nc from a lambda *gt*11 cDNA library. The library was screened using antisera that recognizes PR1a,b,c (1). The clones for PR1a,b,c terminated (*) 7, 45, and 13 nucleotides 3' to the AUG initiation codon, respectively. The sequences of our clones are very similar but not always identical with cDNAs for these genes isolated from *N.t.* cv. Samsun NN (2,3,4), or with genomic clones isolated from *N.t.* cvs. Wisconsin-38 (5), Xanthi nc (6,7,8), and Samsun NN (9).

```
---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  100
PR1a- *ATGTTGTATCTTCACAATTGCCTTCATTTCTTCTTGTCTCTACACTTCTCTTATTCCTAGTAATATCCCACTCTTGCCGTGCCCAAAATTCTC
PR1b-                                        *G                 A      T       CT A        C
PR1c-       * T T      A  T       T            G               A                T A   T    C
---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  200
AACAAGACTATTTGGATGCCCATAACACAGCTCGTGCAGATGTAGGTGTAGAACCTTTGACCTGGGACGACCAGGTAGCAGCCTATGCGCAAAATTATGC
                                                C  G    A  A  T     A  GG                A          T
                                                                                          A
---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  300
TTCCCAATTGGCTGCAGATTGTAACCTCGTACATTCTCATGGTCAATACGGCGAAAACCTAGCTGAGGGAAGTGGCGATTTCATGACGGCTGCTAAGGCC
  T             C  C                  C                      C                T
                                                             TG                T      C
---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  400
GTTGAGATGTGGGTCGATGAGAAACAGTATTATGACCATGACTCAAATACTTGTGCACAAGGACAGGTGTGTGGACACTATACTCAGGTGGTTTGGCGTA
 C
 C                C                  C  C        C        C
---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  500
ACTCGGTTCGTGTTGGATGTGCTAGGGTTCAGTGTAACAATGGAGGATATGTTGTCTCTTGCAACTATGATCCTCCAGGTAATTATAGAGGCGAAAGTCC
                                 A   C                                                GTC T    C
                                                        A                             GT  T    A    C
---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  600
ATACTAATTGAAACGACCTACGTCCATTTCACGTTAATAT..GTATGGATTGTTCTGCTTGATAT....CAAGAACTTAAATAATTGCTCTAAAAAGCAA
            ...TGA T                .  AT      C..             ATATA  C                A
            AC T.. T                .  AT  G   C..             ATAT                    G
---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  700
CTTAAAGTC..AAGTATATAGTAATAGTACTATATTTGTAATCCTCTGAAG...TGGATCTATAAAAAGACCAAGTGGTCATAATTAAGGGGAAAAATAT
   T   TAA         A ...........                AAC       G       T          T           GGG GG
   T   T             ......                T               A     T      T    C  T G    T    -POLY A
---------+---------+---------+---------+---------+---------+--------  768
GAGTTGATGATCAGCTTGATGTATGATCTGATATTATTATGAACACTTTTGTACTCA-POLY A
ATA ..GAAT                                   T    A      T-POLY A
```

ACKNOWLEDGEMENT: This research was funded by grants DMB-8703293 from NSF to D.F.K. and PHS GM 12260 from NIH to J.R.C.

REFERENCES

1. Carr, J.P. *et al.* (1985) Proc. Natl. Acad. Sci. **82**, 7999-8003.
2. Cornelissen, B.J.C. *et al.* (1986) EMBO J. **5**, 37-40.
3. Matsuoka, M. *et al.* (1987) Plant Physiol. **85**, 942-946.
4. Pfitzner, U.M. and Goodman, H. (1987) NARS. **15**, 4449-4465.
5. Pfitzner, U.M. *et al.* (1988) Mol. Gen. Genet. **211**, 290-295.
6. Cutt, J.R., Harpster, M., and Klessig, D.F. (Unpublished).
7. Ohshima, M. *et al.* (1987) FEBS. **225**, 243-246.
8. Payne, G. *et al.* (1988) Plant Molec. Biol. **11**, 89-94.
9. Cornelissen, B.J.C. *et al.* (1987) NARS. **15**, 6799-6811.

© IRL Press Limited, Oxford, England.