Serological detection of pathogenesis-related proteins

R.F. WHITE (Plant Pathology Department, Rothamsted Experimental Station, Harpenden, Herts. AL5 2JQ, United Kingdom)

In double-diffusion tests using an antiserum prepared to PR-1a from *Nicotiana tabacum* cv. Xanthi-nc, PR-1a was shown to be serologically related but not identical to PR-1b and PR-1c. When used in a F(ab')2 ELISA assay, the antiserum could be used to detect as little as 50 pg ml^{-1} of PR-1a.

The ELISA assay detected an increase in what appeared to be serologically related proteins in cowpea and potato following treatment with salicylic acid or virus infection. Salicylic acid treatment of *Gomphrena globosa* induced an increase in a similar protein. Using ELISA no PR-1a-related protein was detected in tomato, cucumber or bean, but its presence was confirmed in potato in double diffusion tests.

This work was done in collaboration with J.F. Antoniw (Biochemistry Department, Rothamsted Experimental Station), D.J. Barbara (Plant Pathology Department, East Malling Research Station, and Patricia Ahl and S. Gianinazzi (Station d'Amélioration des Plantes, Dijon, France).

Translational control of pathogenesis-related-protein synthesis

J.P. CARR (Department of Biochemistry, University of Liverpool, P.O. Box 147, Liverpool L69 3BX, and Biochemistry Department, Rothamsted Experimental Station, Harpenden, Herts. AL5 2JQ, United Kingdom)

The best-studied pathogenesis-related proteins (PRs) of the tobacco mosaic virus (TMV)-localising *Nicotiana tabacum* cultivar Xanthi-nc are PRs-1a (b_1), -1b (b_2) and -1c (b_3). As reported previously (1), it seems likely that the major control point governing synthesis of these proteins is at the translational and not the transcriptional level. Evidence for this hypothesis is summarised below.

Total poly(A)-mRNA was obtained from leaves of healthy and TMV-infected 6-week-old 'Xanthi-nc' plants and used to programme in vitro translation systems. PRs were identified among the translation products of both TMV-infected and healthy leaf mRNA on the basis of charge and size, immune-precipitation and mol. wt values. It was found that each PR protein has its own mRNA and that the size of the mRNA corresponds to the mol. wt of the PR protein coded for, so that neither PRs nor their mRNA's are breakdown products of large precursors.

Supporting evidence for translational control came from the finding that the transcription-blocking antibiotic actinomycin D, without any other inducer present, caused synthesis of PRs when administered to 'Xanthi-nc' leaves (J.P. Carr, J.F. Antoniw and R.F. White, unpublished results).

Most recent experiments have been aimed at the extraction of polyribosomes and messenger-ribonucleoprotein (mRNP) complexes form healthy, TMV-infected and aspirin-treated leaves. If the translational control hypothesis is correct, healthy leaf cells should contain PR-mRNA in a translationally inactive form suquestered by pro-