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Résumé

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Références

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1. Sanford JC, Johnston SA. The concept of parasite-derived resistance-deriving resistance genes from the parasite's own genome. *J Theor Biol* 1985 ; 113 : 395-405.
2. Powell PA, Nelson RS, De B, *et al.* Delay in disease development in transgenic plants that express the tobacco mosaic virus coat protein gene. *Science* 1986 ; 232 : 738-43.
3. Beachy RN. Mechanisms and applications of pathogen-derived resistance in transgenic plants. *Curr Op Biotech* 1997 ; 8 : 215-20.
4. Tepfer M, Lecoq H, Jacquemond M. Évaluation des risques écologiques potentiels associés à l'utilisation agronomique de plantes exprimant des gènes viraux. *Virologie* 1998 ; 2 : 17-31.
5. Havelda Z, Szittyá G, Burgyan J. Characterization of the molecular mechanism of defective interfering RNA-mediated symptom attenuation in tombusvirus-infected plants. *J Virol* 1998 ; 72 : 6251-6.
6. Roossinck MJ, Sleat D, Palukaitis P. Satellite RNAs of plant viruses : structures and biological effects. *Microbiol Rev* 1992 ; 56 : 265-79.
7. Jacquemond M, Tepfer M. Satellite-RNA-mediated resistance to plant viruses : are the ecological risks well assessed ? In : Khetarpal RK, Kohanezawa H, Hadidi A eds. *Control of plant virus diseases*. St Paul, MN USA : APS Press, 1998 : 94-120.
8. Vaish NK, Kore AR, Eckstein F. Recent developments in the hammerhead ribozyme field. *Nucl Acids Res* 1998 ; 26 : 5237-42.

9. de-Feyter R, Young M, Schroeder K, Dennis ES, Gerlach W. A ribozyme gene and an antisense gene are equally effective in conferring resistance to tobacco mosaic virus on transgenic tobacco. *Mol Gen Genet* 1996 ; 250 : 329-38.
10. Kooter JM, Matzke M A, Meyer P. Listening to the silent genes : transgene silencing, gene regulation and pathogen control. *Trends Plant Sci* 1999 ; 9 : 340-7.
11. Hamilton AJ, Baulcombe DC. A species of small antisense RNA in post-transcriptional gene silencing. *Science* 1999 ; 286 : 950-2.
12. Register JC, Nelson RS. Early events in plants virus infection : relationships with genetically engineered protection and host gene resistance. *Sem Virol* 1992 ; 3 : 441-51.
13. Pang SZ, Slightom JL, Gonsalves D. Different mechanisms protect transgenic tobacco against tomato spotted wilt and impatiens necrotic spot tospoviruses. *Bio/Technology* 1993 ; 11 : 819-24.
14. Tacke E, Salamini F, Rohde W. Genetic engineering of potato for broad-spectrum protection against virus infection. *Nature Biotech* 1996 ; 14 : 1597-601.
15. Ares X, Calamante G, Cabral S, *et al.* Transgenic plants expressing potato virus X ORF2 protein (p24) are resistant to tobacco mosaic virus and Ob tobamoviruses. *J Virol* 1998 ; 72 : 731-8.
16. Wintermantel WM, Banerjee N, Oliver JC, Paolillo DJ, Zaitlin M. Cucumber mosaic virus is restricted from entering minor veins in transgenic tobacco exhibiting replicase-mediated resistance. *Virology* 1997 ; 231 : 248-57.
17. Flor HH. The complementary genetic system in flax and flax rust. *Adv Genet* 1956 ; 8 : 29-54.
18. Staskawicz BJ, Ausubel FM, Baker BJ, Ellis JG, Jones JDG. Molecular genetics of plant disease resistance. *Science* 1995 ; 268 : 661-7.
19. Jones JDG. Plant disease resistance genes : structure, function and evolution. *Curr Op Biotech* 1996 ; 7 : 155-60.
20. Whitman S, Dinesh-Kumar SSP, Choi D, Hehl R, Corr C, Baker B. The product of the tobacco mosaic virus resistance gene *N* : similarity to Toll and the Interleukin-1 receptor. *Cell* 1994 ; 78 : 1101-15.
21. Bendahmane A, Kanyukaa K, Baulcombe D. The *Rx* gene from potato controls separate virus resistance and cell death responses. *Plant Cell* 1999 ; 11 : 781-92.
22. Whitham S, McCormick S, Baker B. The *N* gene of tobacco confers resistance to tobacco mosaic virus in transgenic tomato. *Proc Natl Acad Sci USA* 1996 ; 93 : 8776-81.
23. Dempsey DA, Klessig DF. Signals in plant disease resistance. *Bull Inst Pasteur* 1995 ; 93 : 167-86.
24. Nasuta N, Takana H, Uehara K, Kuwata S, Koiwai A, Noma M. Broad resistance to plant viruses in transgenic plants conferred by antisense inhibition of a host gene essential in S-adenosyl-methionine dependent transmethylation reactions. *Proc Natl Acad Sci USA* 1995 ; 92 : 6117-21.
25. Oldroyd GED, Staskawicz B. Genetically engineered broad-spectrum disease resistance in tomato. *Proc Natl Acad Sci USA* 1998 ; 95 : 10300-5.
26. Girbès T, Ferreras JM, Iglesias R, Citores L, De Torre C, Carbajales ML, *et al.* Recent advances in the uses and applications of ribosome-inactivating proteins from plants. *Cell Mol Biol* 1996 ; 42 : 461-71.
27. Lodge JK, Kaniewski WK, Tumer NE. Broad-spectrum virus resistance in transgenic plants expressing pokeweed antiviral protein. *Proc Natl Acad Sci USA* 1993 ; 90 : 7089-93.
28. Bonness M, Ready MP, Irvin JD, Mabry T. Pokeweed antiviral protein inactivates pokeweed ribosomes : implications for the antiviral mechanism. *Plant J* 1994 ; 5 : 173-83.

29. Lee-Huang S, Huang PL, Huang PL, Bourinbaiar AS, Chen HC, Kung HF. Inhibition of the integrase of human immunodeficiency virus (HIV) type 1 by anti-HIV plant proteins MAP30 et GAP31. *Proc Natl Acad Sci USA* 1995 ; 92 : 8818-22.
30. Tumer NE, Hwang DJ, Bonness M. A C-terminal deletion mutant of pokeweed antiviral protein inhibits viral infection but does not depurinate host ribosomes. *Proc Natl Acad Sci USA* 1997 ; 94 : 3866-71.
31. Whitelam GC, Cockburn W. Antibody expression in transgenic plants. *Trends Plant Sci* 1996 ; 1 : 268-72.
32. Zimmermann S, Schillberg S, Liao YC, Fischer R. Intracellular expression of TMV-specific single-chain Fv fragments leads to improved virus resistance in *Nicotiana tabacum*. *Mol Breeding* 1998 ; 4 : 369-79.
33. Voss A, Niersbach M, Hain R, *et al.* Reduced virus infectivity in *Nicotiana tabacum* secreting a TMV-specific full-size antibody. *Mol Breeding* 1995 ; 1 : 39-50.
34. Sen GC, Ransohoff RM. Interferon-induced antiviral actions and their regulation. *Adv Virus Res* 1993 ; 42 : 57-101.
35. Truve E, Kelve M, Aaspollu A, Kuusksalu A, Seppanen P, Saarma M. Principles and background for the construction of transgenic plants displaying multiple virus resistance. *Arch Virol* 1994 ; 9 : 41-50.
36. Truve E, Aaspollu A, Honkanen J, *et al.* Transgenic potato plants expressing mammalian 2',5'-oligoadenylate synthase are protected from potato virus X infection under field conditions. *Bio/Technology* 1993 ; 11 : 1048-50.
37. Mitra A, Higgins DW, Langerberg WC, Nie H, Sengupta DN, Silverman R. A mammalian 2-5A system functions as an antiviral pathway in transgenic plants. *Proc Natl Acad Sci USA* 1996 ; 93 : 6780-5.
38. Ogawa T, Hori T, Ishida I. Virus-induced cell death in plants expressing the mammalian 2',5'-oligoadenylate system. *Nature Biotech* 1996 ; 14 : 1566-9.
39. Terenzi F, De veer MJ, Ving H, Restifo NP, Williams BRG, Silvermann RH. The antiviral enzymes PKR and RNase L suppress gene expression from viral and non-viral based vectors. *Nucl Acids Res* 1999 ; 27 : 4369-75.
40. Yeung MC, Chang DL, Camantigue RE, Lau AS. Inhibitory role of the host apoptogenic gene *PKR* in the establishment of persistent infection by encephalomyocarditis virus in U937 cells. *Proc Natl Acad Sci USA* 1999 ; 96 : 11860-5.
41. Kaufman RJ. Double-stranded RNA-activated protein kinase mediates virus-induced apoptosis : a new role for an old actor. *Proc Natl Acad Sci USA* 1999 ; 96 : 11693-5.
42. Lino Y, Sugimoto A, Yamamoto M. *Schizosaccharomyces pombe* pac1+, whose overexpression inhibits sexual development, encodes a ribonuclease III-like RNase. *EMBO J* 1991 ; 10 : 221-6.
43. Rotondo G, Huang JY, Frendewey D. Substrate structure requirements of the Pac1 ribonuclease from *Schizosaccharomyces pombe*. *RNA* 1997 ; 3 : 1182-93.
44. Watanabe Y, Ogawa T, Takahashi H, *et al.* Resistance against multiple plant viruses in plants mediated by a double stranded-RNA specific ribonuclease. *FEBS* 1995 ; 372 : 165-8.
45. Sano T, Nagayama A, Ogawa T, Ishida I, Okada Y. Transgenic potato expressing a double-stranded RNA-specific ribonuclease is resistant to potato spindle tuber viroid. *Nature Biotech* 1997 ; 15 : 1290-4.
46. Langenberg WG, Zhang L, Court DL, Giunchedi L, Mitra A. Transgenic tobacco plants expressing the bacterial *rnc* gene resist virus infection. *Mol Breeding* 1997 ; 3 : 391-9.
47. Teycheney PY. Plantes et virus : la guerre sans fin. *Biofutur* 1999 ; 189 : 30-3.

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