



(86) Date de dépôt PCT/PCT Filing Date: 2000/01/11
 (87) Date publication PCT/PCT Publication Date: 2000/07/20
 (85) Entrée phase nationale/National Entry: 2001/07/10
 (86) N° demande PCT/PCT Application No.: US 00/00724
 (87) N° publication PCT/PCT Publication No.: WO 00/42171
 (30) Priorités/Priorities: 1999/01/12 (09/228,986) US;
 1999/11/01 (60/162,866) US

(51) Cl.Int.⁷/Int.Cl.⁷ C12N 5/04, A01H 5/00, C12N 15/87,
 C12N 15/82, C12Q 1/37, C12N 15/29, C07H 21/04,
 C07H 21/02

(71) Demandeur/Applicant:
 GENESIS RESEARCH AND DEVELOPMENT
 CORPORATION LTD., NZ

(72) Inventeurs/Inventors:
 NIEUWENHUIZEN, NICOLAAS J., NZ;
 STRABALA, TIMOTHY J., NZ

(74) Agent: SMART & BIGGAR

(54) Titre : COMPOSITIONS ISOLEES A PARTIR DE CELLULES VEGETALES, ET LEUR UTILISATION DANS LA
 MODIFICATION DE LA SIGNALISATION DESDITES CELLULES
 (54) Title: COMPOSITIONS ISOLATED FROM PLANT CELLS AND THEIR USE IN THE MODIFICATION OF PLANT
 CELL SIGNALING

(57) **Abrégé/Abstract:**

Novel isolated polynucleotides that encode polypeptides involved in plant cell signaling are provided, together with DNA constructs comprising such polynucleotides. Methods for using such constructs for the modulation of cell signaling in plants are also disclosed, together with transgenic plants comprising such constructs.



**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : C12N 5/04, 15/29, 15/82, 15/87, A01H 5/00, C07H 21/02, 21/04, C12Q 1/37</p>	A1	<p>(11) International Publication Number: WO 00/42171</p> <p>(43) International Publication Date: 20 July 2000 (20.07.00)</p>					
<p>(21) International Application Number: PCT/US00/00724</p> <p>(22) International Filing Date: 11 January 2000 (11.01.00)</p> <p>(30) Priority Data:</p> <table border="0"> <tr> <td>09/228,986</td> <td>12 January 1999 (12.01.99)</td> <td>US</td> </tr> <tr> <td>60/162,866</td> <td>1 November 1999 (01.11.99)</td> <td>US</td> </tr> </table> <p>(71) Applicant (for all designated States except US): GENESIS RESEARCH AND DEVELOPMENT CORPORATION LTD. [NZ/NZ]; 1 Fox Street, 1001 Parnell (NZ).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): STRABALA, Timothy, J. [US/NZ]; 18 Riro Street, Auckland (NZ). NIEUWENHUIZEN, Nicolaas, J. [NL/NZ]; 2/25 Mt. Pleasant Road, Mt. Eden, Auckland (NZ).</p> <p>(74) Agents: SPECKMAN, Ann et al.; 2601 Elliott Avenue, Suite 4185, Seattle, WA 98121 (US).</p>	09/228,986	12 January 1999 (12.01.99)	US	60/162,866	1 November 1999 (01.11.99)	US	<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published</p> <p><i>With international search report.</i></p> <p><i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
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<p>(54) Title: COMPOSITIONS ISOLATED FROM PLANT CELLS AND THEIR USE IN THE MODIFICATION OF PLANT CELL SIGNALING</p>							
<p>(57) Abstract</p> <p>Novel isolated polynucleotides that encode polypeptides involved in plant cell signaling are provided, together with DNA constructs comprising such polynucleotides. Methods for using such constructs for the modulation of cell signaling in plants are also disclosed, together with transgenic plants comprising such constructs.</p>							

Claims:

1. An isolated polynucleotide comprising a sequence selected from the group consisting of: (a) sequences provided in SEQ ID NO: 1-67, 131-481 and 833-888; (b) complements of the sequence recited in SEQ ID NO: 1-67, 131-481 and 833-888; (c) reverse complements of the sequence recited in SEQ ID NO: 1-67, 131-481 and 833-888; (d) reverse sequences of the sequences recited in SEQ ID NO: 1-67, 131-481 and 833-888; (e) sequences having at least 40% identical nucleotides to a sequence provided in SEQ ID NO: 1-67, 131-481 and 833-888 as determined using the computer algorithm BLASTN; (f) sequences having at least 60% identical nucleotides to a sequence provided in SEQ ID NO: 1-67, 131-481 and 833-1300 as determined using the computer algorithm BLASTN; (g) sequences having at least 75% identical nucleotides to a sequence provided in SEQ ID NO: 1-67, 131-481 and 833-888 as determined using the computer algorithm BLASTN; (h) sequences having at least 90% identical nucleotides to a sequence provided in SEQ ID NO: 1-67, 131-481 and 833-888 as determined using the computer algorithm BLASTN; (i) nucleotide sequences that are 200-mers of a sequence recited in (a) – (d) above; (j) nucleotide sequences that are 100-mers of a sequence recited in (a) – (d) above; (k) nucleotide sequences that are 40-mers of a sequence recited in (a) – (d) above; and (l) nucleotide sequences that are 20-mers of a sequence recited in (a) – (d) above.
2. An isolated polypeptide encoded by a polynucleotide according to claim 1.
3. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of: (a) sequences of SEQ ID NO: 68-130, 482-832 and 889-945; (b) sequences having at least 50% identical residues to a sequence of (a); sequences having at least 70% identical residues to a sequence of (a); and sequences having at least 90% identical residues to a sequence of (a).
4. An isolated polynucleotide that encodes a polypeptide according to claim 3.
5. A DNA construct comprising a polynucleotide according to claim 1.
6. A transgenic cell comprising a DNA construct according to claim 5.
7. A DNA construct comprising, in the 5'-3' direction:

- (a) a gene promoter sequence,
 - (b) an open reading frame coding for at least a functional portion of a polypeptide encoded by an isolated polynucleotide of claim 1; and
 - (c) a gene termination sequence.
8. The DNA construct of claim 7 wherein the open reading frame is in a sense orientation.
9. The DNA construct of claim 7 wherein the open reading frame is in an antisense orientation.
10. The DNA construct of claim 7 wherein the gene promoter sequence and gene termination sequences are functional in a plant host.
11. The DNA construct of claim 7 further comprising a marker for identification of transformed cells.
12. A DNA construct comprising, in the 5'-3' direction:
- (a) a gene promoter sequence,
 - (b) a non-coding region of an isolated polynucleotide of any one of claims 1-6 and 9; and
 - (c) a gene termination sequence.
13. The DNA construct of claim 12 wherein the non-coding region is in a sense orientation.
15. The DNA construct of claim 12 wherein the non-coding region is in an antisense orientation.
15. The DNA construct of claim 12 wherein the gene promoter sequence and gene termination sequences are functional in a plant host.
16. A transgenic plant cell comprising a DNA construct of any one of claims 7-15.
17. A plant comprising a transgenic plant cell according to claim 16, or a part, propagule or progeny thereof.
18. The plant of claim 17 wherein the plant is a woody plant.
19. The plant of claim 18 wherein the plant is selected from the group consisting of eucalyptus, pine, acacia, poplar, sweetgum, teak and mahogany species

20. A method for modifying cell signaling in a plant comprising stably incorporating into the genome of the plant a DNA construct according to any one of claims 7-15.
21. The method of claim 20 wherein the plant is a woody plant.
22. The method of claim 21, wherein the plant is selected from the group consisting of eucalyptus, pine, acacia, poplar, sweetgum, teak and mahogany species.
23. A method for producing a plant having modified cell signaling comprising:
 - (a) transforming a plant cell with a DNA construct according to any one of claims 7-15 to provide a transgenic cell; and
 - (b) cultivating the transgenic cell under conditions conducive to regeneration and mature plant growth.
24. The method of claim 23 wherein the plant is a woody plant.
25. The method of claim 24 wherein the plant is selected from the group consisting of eucalyptus, pine, acacia, poplar, sweetgum, teak and mahogany species.
26. A method for modifying the activity of a polypeptide in a plant comprising stably incorporating into the genome of the plant a DNA construct according to any one of claims 7-15.
27. The method of claim 26 wherein the plant is a woody plant.
28. The method of claim 27 wherein the plant is selected from the group consisting of eucalyptus, pine, acacia, poplar, sweetgum, teak and mahogany species.
29. An isolated oligonucleotide probe or primer comprising at least 10 contiguous residues complementary to 10 contiguous residues of a nucleotide sequence recited in claim 1.
30. A kit comprising a plurality of oligonucleotide probes or primers of claim 29.
31. A storage medium having recorded thereon a plurality of polynucleotides, at least one of the polynucleotides comprising a nucleotide sequence recited in claim 1.