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(54) Title: REGULATORY GENES SUITABLE FOR USE IN GENE EXPRESSION

(57) Abstract: The present invention relates to novel AlcR regulatory elements and nucleic acid sequences coding therefor, and their use in controlling gene expression in organisms such as plants. DNA constructs containing such nucleic acids, in particular, expression cassettes comprising inducible promoter elements and regulatory elements of the invention, which are capable of acting as "gene switches", form further aspects of the invention.



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INTERNATIONAL SEARCH REPORT

International Application No
 Filing No. GB 02/00633

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C12N15/82

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, MEDLINE, WPI Data, PAJ, SCISEARCH, CAB Data, CHEM ABS Data, BIOTECHNOLOGY ABS, SEQUENCE SEARCH, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NIKOLAEV I ET AL: "A SINGLE AMINO ACID, OUTSIDE THE ALCR ZINC BINUCLEAR CLUSTER, IS INVOLVED IN DNA BINDING AND IN TRANSCRIPTIONAL REGULATION OF THE ALC GENES IN ASPERGILLUS NIDULANS" MOLECULAR MICROBIOLOGY, BLACKWELL SCIENTIFIC, OXFORD, GB, vol. 31, no. 4, February 1999 (1999-02), pages 1115-1124, XP000974774 ISSN: 0950-382X page 1118 --- -/--	1-4,6-11

Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier document but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 15 August 2002	Date of mailing of the international search report 04.10.02
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel: (+31-70) 340-2040, Tx: 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer De Kok, A
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 02/00633

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EHRlich K C ET AL: "Binding of the C6-zinc cluster protein, AFLR, to the promoters of aflatoxin pathway biosynthesis genes in <i>Aspergillus parasiticus</i>." GENE (AMSTERDAM), vol. 230, no. 2, 16 April 1999 (1999-04-16), pages 249-257, XP002209396 ISSN: 0378-1119 abstract</p> <p style="text-align: center;">---</p>	1,6-10
A	<p>WO 93 21334 A (ZENECA LTD (GB)) 28 October 1993 (1993-10-28) cited in the application page 2, line 34 -page 12, line 7</p> <p style="text-align: center;">---</p>	1-33
A	<p>WO 94 13820 A (GIST BROCADES NV) 23 June 1994 (1994-06-23) page 2, line 37 -page 3, line 3</p> <p style="text-align: center;">---</p>	31-33
A	<p>WO 00 44917 A (ZENECA LTD (GB)) 3 August 2000 (2000-08-03) cited in the application the whole document</p> <p style="text-align: center;">---</p>	30
A	<p>TODD RICHARD B ET AL: "Evolution of a fungal regulatory gene family: The Zn(II)2Cys6 binuclear cluster DNA binding motif." FUNGAL GENETICS AND BIOLOGY, vol. 21, no. 3, 1997, pages 388-405, XP002209397 ISSN: 1087-1845 the whole document</p> <p style="text-align: center;">-----</p>	1-33

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 02/00633

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: **1-30, partially**
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

SEE PCT/ISA/210

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-30, partially

Present claims 1-30 relate to a polypeptide defined by reference to a desirable characteristic or property, namely by its ability to activate an alc inducible promoter.

The claims cover all polypeptides having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a very limited number of such polypeptides. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the polypeptide by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the polypeptides having an amino acid sequence as identified by SEQ.ID.No. 124, 125 and 126.

Present claims 6-10 relate to an extremely large number of possible polypeptides. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the polypeptides claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the polypeptides having an amino acid sequence as identified by SEQ.ID.No. 124, 125 and 126.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a *preliminary examination on matter which has not been searched*. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

Invention 1: claims 1-33, all partially

A polypeptide capable of activating an alc inducible promoter and having an amino acid sequence specified in SEQ.ID.No 124, 125 or 126; a nucleic acid encoding said polypeptide; an expression cassette comprising said nucleic acid; a cell comprising said expression cassette; methods for controlling gene expression using said expression cassettes and alcR promoter sequences (if applicable).

Inventions 2-12: claims 1-33 all partially

As invention 1, but limited to each single polypeptide having an amino acid sequence as specified by a SEQ.Id. as listed in claim 5, starting with SEQ.ID.No.127 and ending with SEQ.ID.No.66.

For the sake of conciseness, the subject-matter of the first invention is explicitly defined, the subject-matter of the other inventions is defined by analogy thereto.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 02/00633

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9321334	A	28-10-1993	AT 207962 T	15-11-2001
			AU 3901993 A	18-11-1993
			DE 69331055 D1	06-12-2001
			DE 69331055 T2	20-06-2002
			DK 637339 T3	03-12-2001
			EP 0637339 A1	08-02-1995
			ES 2164659 T3	01-03-2002
			WO 9321334 A1	28-10-1993
			PT 637339 T	28-03-2002

WO 9413820	A	23-06-1994	AT 219143 T	15-06-2002
			AU 666443 B2	08-02-1996
			AU 6653494 A	04-07-1994
			CA 2151154 A1	23-06-1994
			DE 69332030 D1	18-07-2002
			DE 69332030 T2	02-10-2002
			WO 9413820 A1	23-06-1994
			EP 0673429 A1	27-09-1995
			FI 952801 A	07-06-1995
			JP 8504327 T	14-05-1996
			NO 952293 A	09-06-1995
			NZ 259339 A	28-05-1996
			US 5710021 A	20-01-1998
			US 5674707 A	07-10-1997

WO 0044917	A	03-08-2000	AU 1875700 A	18-08-2000
			BR 9917010 A	22-01-2002
			CN 1338000 T	27-02-2002
			EP 1151120 A1	07-11-2001
			WO 0044917 A1	03-08-2000
