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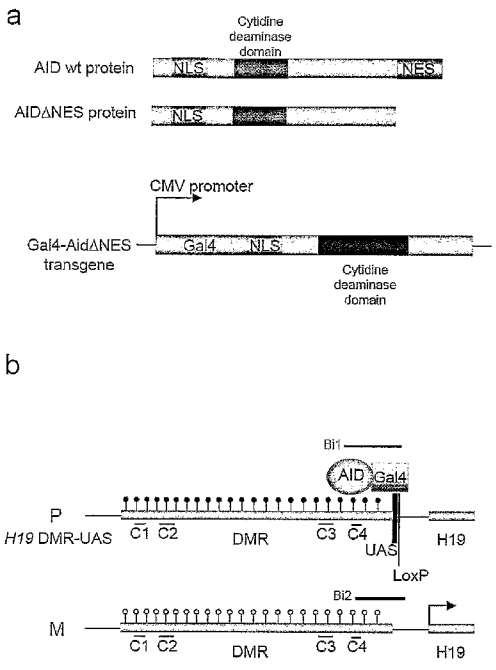
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Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv))*

Published:
— *with international search report*

[Continued on next page]

(54) Title: COMPOSITIONS AND METHODS FOR EPIGENETIC MODIFICATION OF NUCLEIC ACID SEQUENCES IN VIVO



(57) Abstract: Demethylation of a methylated DNA sequence in a eukaryotic cell is described, utilising a molecule that includes at least a first domain that exhibits a cytidine deaminase activity and at least a second domain that confers either a specific or non-specific DNA binding activity. The molecules of the invention are useful in somatic cell nuclear transfer and also in cancer therapy.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
21 February 2008

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2007/001304

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12N15/62

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)
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, WPI Data, EMBL, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 03/012051 A (OREGON STATE [US]; US GOVERNMENT [US]; UNIV SOUTHERN CALIFORNIA [US];) 13 February 2003 (2003-02-13) page 12, line 27 - line 39	1-45
A	WO 02/08286 A (SYNGENTA PARTICIPATIONS AG [CH]; SERA TAKASHI [US]) 31 January 2002 (2002-01-31) claim 32	1-45
A	WO 98/29108 A (FEINBERG ANDREW P [US]) 9 July 1998 (1998-07-09) claims 1-3	1-45

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" 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

"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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 December 2007	20/12/2007

Name and mailing address of the ISA/	Authorized officer
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	SCHWACHTGEN, J

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2007/001304

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 35-40 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

2. [ ] Claims Nos.:
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:

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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

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

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers 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.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[ ] No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2007/001304

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03012051 A	13-02-2003	AU 2002322805 A2	17-02-2003
		CA 2454147 A1	13-02-2003
		EP 1418949 A2	19-05-2004
		JP 2005508885 T	07-04-2005
WO 0208286 A	31-01-2002	AU 7849601 A	05-02-2002
		CA 2416664 A1	31-01-2002
		EP 1303608 A2	23-04-2003
		JP 2004519211 T	02-07-2004
		US 2004091878 A1	13-05-2004
		ZA 200300651 A	11-11-2003
WO 9829108 A	09-07-1998	AT 235190 T	15-04-2003
		AU 5722398 A	31-07-1998
		CA 2276306 A1	09-07-1998
		DE 69720283 D1	30-04-2003
		DE 69720283 T2	29-01-2004
		DK 969822 T3	21-07-2003
		EP 0969822 A2	12-01-2000
		ES 2195196 T3	01-12-2003
		JP 2001507703 T	12-06-2001