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- (71) Applicant (for all designated States except US): **UNIVERSITY OF DUNDEE** [GB/GB]; 11 Perth Road, Dundee DD1 4HN (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **BIONDI, Ricardo** [AR/GB]; Division of Signal Transduction Therapy, School of Life Sciences, University of Dundee, Dundee DD1 5EH (GB). **FRAME, Sheelagh** [GB/GB]; Division of Signal Transduction Therapy, School of Life Sciences, University of Dundee, Dundee DD1 5EH (GB).
- (74) Agent: **MILES, John, S.**; Eric Potter Clarkson, Park View House, 58 The Ropewalk, Nottingham NG1 5DD (GB).
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(54) Title: PROTEIN KINASE REGULATION

(57) Abstract: Methods are provided for identifying compounds that are capable of, for example, inhibiting the activity of GSK3 towards phosphate-dependent (primed) substrates to a greater extent than towards non-phosphate-dependent substrates. Mutant GSK3s and other novel polypeptides, polynucleotides and recombinant cells that are useful in such methods are provided. For example, polypeptides useful in modulating the activity of GSK3 are also provided.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 01/04220

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C12Q1/48 C12N9/12

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 C12Q G01N 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)

WPI Data, EPO-Internal, SCISEARCH, CHEM ABS Data, SEQUENCE SEARCH, EMBASE, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 97 41854 A (UNIV PENNSYLVANIA ; HARVARD COLLEGE (US)) 13 November 1997 (1997-11-13) the whole document	
A	US 6 057 286 A (RING DAVID B ET AL) 2 May 2000 (2000-05-02) the whole document	
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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
- *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.
- *Z* document member of the same patent family

Date of the actual completion of the international search

19 March 2002

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04/04/2002

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

Niemann, F

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 01/04220

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>THOMAS G M ET AL: "A GSK3-binding peptide from FRAT1 selectively inhibits the GSK3-catalysed phosphorylation of Axin and beta-catenin" FEBS LETTERS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 458, no. 2, 17 September 1999 (1999-09-17), pages 247-251, XP004260269 ISSN: 0014-5793 cited in the application the whole document</p> <p style="text-align: center;">---</p>	
A	<p>WO 97 22360 A (MEDICAL RES COUNCIL ;UNIV DUNDEE (GB); ALESSI DARIO (GB); COHEN PH) 26 June 1997 (1997-06-26) claim 31; figure 4</p> <p style="text-align: center;">---</p>	
T	<p>FRAME SHEELAGH ET AL: "A common phosphate binding site explains the unique substrate specificity of GSK3 and its inactivation by phosphorylation." MOLECULAR CELL, vol. 7, no. 6, June 2001 (2001-06), pages 1321-1327, XP002193599 ISSN: 1097-2765 the whole document</p> <p style="text-align: center;">---</p>	
T	<p>DAJANI RANA ET AL: "Crystal structure of glycogen synthase kinase 3beta: Structural basis for phosphate-primed substrate specificity and autoinhibition." CELL, vol. 105, no. 6, 15 June 2001 (2001-06-15), pages 721-732, XP002193600 ISSN: 0092-8674 the whole document</p> <p style="text-align: center;">-----</p>	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 28-67

Present claims 28-67 relate to a compound/mutant defined by reference to a desirable characteristic or property, namely modulating the protein kinase activity of GSK3, interacting with the phosphate binding site of GSK3 or being a mutated GSK3 wherein one or more residues defining the phosphate binding site of GSK3 is mutated.

The claims cover all compounds/mutants 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 compounds/mutants. 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 compounds/mutants 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 NT-Pptides 'see description at page 66!', and the mutants disclosed in the description pages 69-81.

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 01/04220

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9741854	A	13-11-1997	AU	2819397 A	26-11-1997
			EP	1019043 A1	19-07-2000
			WO	9741854 A1	13-11-1997

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			EP	0868195 A2	07-10-1998
			WO	9722360 A2	26-06-1997
			JP	2000502097 T	22-02-2000
