



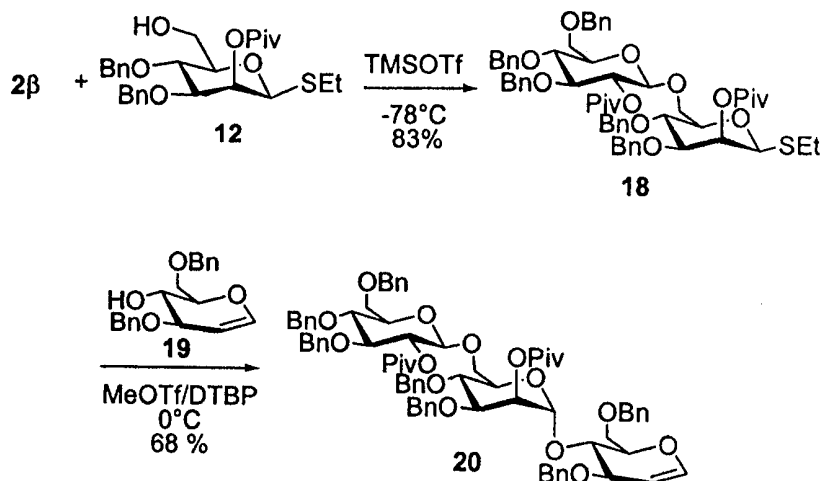
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US99/23292 (22) International Filing Date: 6 October 1999 (06.10.99) (30) Priority Data: 60/103,291 6 October 1998 (06.10.98) US (71) Applicant: MASSACHUSETTS INSTITUTE OF TECHNOLOGY [US/US]; 77 Massachusetts Avenue, Cambridge, MA 02139 (US). (72) Inventors: SEEBERGER, Peter, H.; 100 Memorial Drive #2-19A, Cambridge, MA 02142 (US). PLANTE, Obadiah, J.; 352 Cabot Street, Beverly, MA 01915 (US). (74) Agents: VINCENT, Matthew, P. et al.; Foley, Hoag & Eliot, LLP, One Post Office Square, Boston, MA 02109 (US).		(81) Designated States: CA, JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report. (88) Date of publication of the international search report: 14 September 2000 (14.09.00)

(54) Title: SYNTHESIS OF OLIGOSACCHARIDES, REAGENTS AND METHODS RELATED THERETO

(57) Abstract

One aspect of the present invention relates to differentially protected glycosyl phosphates. Another aspect of the present invention relates to the preparation of glycosyl phosphates from glycal precursors. In another aspect of the present invention, glycosyl phosphates are used as glycosyl donors in glycosylation reactions.



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/23292

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07H11/04 C07B61/00

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 C07H C07B

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 095 123 A (SABESAN SUBRAMANIAM) 10 March 1992 (1992-03-10) Reaction scheme 1 -----	1-4, 6, 8, 10, 12, 14, 16, 17, 19
X	US 4 785 084 A (WARREN CHRISTOPHER ET AL) 15 November 1988 (1988-11-15) Equation 1 ----- ----- -/-	1-4, 6, 8, 10, 12, 14, 16, 17, 19

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

18 May 2000

Date of mailing of the international search report

13/06/2000

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de Nooy, A

International Application No
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/23292

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	C.M. TIMMERS, N.C.R. VAN STRATEN, G.A. VAN DER MAREL, J.H. VAN BOOM: "An expeditious route to streptococci and enterococci glycolipids via ring-opening of 1,2-anhydrosugars with protic acids" J. CARBOHYDRATE CHEMISTRY, vol. 17, no. 3, 1998, pages 471-487, XP002135533 cited in the application page 472, paragraph 3 page 473, paragraph 1 Scheme 1	1-4,6,8, 10,12, 14,16, 17,19, 23,42-44
X	L. LAUPICHLER, H. SAJUS, J. THIEM: "Convenient iodonium-promoted stereoselective synthesis of 2-deoxy-alpha-glycosides by use of S-(2-deoxyglycosyl) phosphorodithioates as donors" SYNTHESIS, 1992, pages 1133-1136, XP002135534 Scheme 1, Table 1	1-3,5,9, 10,13, 14,16, 18,21, 24,25, 37-39
X	R. LIANG, L. YAN, J. LOEBACH, M. GE, Y. UOZUMI, K. SEKANINA, N. HORAN, J. GILDERSLEEVE, C. THOMPSON, A. SMITH, D. KAHNE: "Parallel synthesis and screening of a solid phase carbohydrate library" SCIENCE, vol. 274, 1996, pages 1520-1522, XP000891601 cited in the application page 1521, left-hand column, paragraph 2 -right-hand column, paragraph 2 figure 2	41
P,X	O.J. PLANTE, P.H. SEEBERGER: "Anomeric phosphorodithioates as novel glycosylating agents" J. ORG. CHEM., vol. 63, 1998, pages 9150-9151, XP002135535 cited in the application the whole document	1-3,5,6, 9,10, 13-16, 18,21, 24,25, 27-36, 42-44

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 99/ 23292

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.:
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 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:

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.:

Remark on Protest

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

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 99 23292

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-22 (partially)

Present claims 1-22 relate to an extremely large number of possible compounds. 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 compounds 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 examples disclosed in the application.

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

Int: tional Application No

PCT/US 99/23292

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5095123 A	10-03-1992	CA 2095860 A	31-05-1992
		DE 69107086 D	09-03-1995
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		EP 0317572 A	31-05-1989
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