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- (21) International Application Number: PCT/US00/05659 (74) Agents: CELLA, Charles, H. et al.; Foley, Hoag & Eliot, LLP, One Post Office Square, Boston, MA 02109 (US).
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- (71) Applicant: MASSACHUSETTS INSTITUTE OF TECHNOLOGY [US/US]; 77 Massachusetts Avenue, Cambridge, MA 02139 (US). (88) Date of publication of the international search report: 18 October 2001
- (72) Inventors: SEEBERGER, Peter, H.; 100 Memorial Drive, #2-19A, Cambridge, MA 02142 (US). ANDRADE, For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



(54) Title: LINKERS FOR SYNTHESIS OF OLIGOSACCHARIDES ON SOLID SUPPORTS

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(57) Abstract: In certain embodiments, the present invention relates to versatile linkers for tethering a molecule to a solid support, e.g. for tethering a monomer, oligomer or polymer to a solid support, which are stable to a wide range of reaction conditions, but can be cleaved under well-defined conditions, thereby liberating said molecule from the solid support. In preferred embodiments, the linkers of the present invention are used to tether to the solid support unprotected, partially-protected or fully-protected monosaccharides or oligosaccharides, or unprotected, partially-protected or fully-protected glycoconjugates. In other embodiments, the linkers of the present invention may be used to tether to solid supports building blocks useful in the assembly of libraries of other types of small molecules. In certain embodiments, the present invention relates to a molecule or plurality of molecules tethered to the solid support via a linker or linkers of the present invention. In certain embodiments, the present invention relates to processes for synthesizing molecules, e.g. monomers, oligomers or polymers, on a solid support, wherein a starting material in the synthesis of said molecule, intermediates in the synthesis of said molecule, and said molecule itself are tethered to the solid support during the process via one of the linkers of the present invention. In certain processes of the present invention, the molecule is liberated from the solid support by cleavage of the linker of the present invention.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C07H1/00 C07H3/00 C08B37/00 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) CHEM ABS Data, BEILSTEIN Data, EPO-Internal, WPI Data				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	D. RAEDERSTORFF: "Biosynthetic studies of marine lipids. 11. Synthesis, biosynthesis, and absolute configuration of internally branched demospongiic acid, 22-methyl-5,9-octacosadienic acid" JOURNAL OF ORGANIC CHEMISTRY, vol. 52, no. 12, 1987, pages 2337-2346, XP002164657 EASTON US pages 2342, scheme VI and page 2345, column 2, compounds 31 and 32 <div style="text-align: center;"> --- -/-- </div>	1-16, 18, 25-30, 32		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.				
° Special categories of cited documents :				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <ul style="list-style-type: none"> *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 </td> <td style="width: 50%; border: none; vertical-align: top;"> <ul style="list-style-type: none"> *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 </td> </tr> </table>			<ul style="list-style-type: none"> *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 	<ul style="list-style-type: none"> *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
<ul style="list-style-type: none"> *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 	<ul style="list-style-type: none"> *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 <div style="text-align: center; font-size: 1.2em;">19 April 2001</div>		Date of mailing of the international search report <div style="text-align: center; font-size: 1.2em;">04/05/2001</div>		
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 <div style="text-align: center; font-size: 1.2em;">Wright, M</div>		

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/05659

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	U. JAHN: "Towards a tandem-radical macrocyclization-transannular cyclization approach to steroids: transannular cyclizations of a macrocyclic core" TETRAHEDRON LETTERS, vol. 36, no. 49, 1995, pages 8921-8924, XP004026773 OXFORD GB page 8924, compound 18 ----	1-16,18, 25-30,32
X	K. MIURA: "Highly stereoselective intramolecular addition of a hydroxyl group to vinylsilanes via 1,2-silyl migration" JOURNAL OF ORGANIC CHEMISTRY, vol. 62, no. 24, 1997, pages 8292-8293, XP002164658 EASTON US table 1, entries 9 and 10, compounds 4 ----	1-16,18, 25-30,32
X	N. HAYASHI: "The biomimetic construction of fused cyclic polyethers" TETRAHEDRON, (INCL TETRAHEDRON REPORTS), vol. 53, no. 37, 1997, pages 12425-12468, XP004106162 OXFORD GB pages 12450-12452, compounds 16, 29 and 31 ----	1-16,18, 25-30,32
A	DE 196 21 177 A (BASF) 27 November 1997 (1997-11-27) claims; examples ----	1,25,39, 53
P,X	R. B. ANDRADE: "Solid-phase oligosaccharide synthesis: preparation of complex structures using a novel linker and different glycosylating agents" ORGANIC LETTERS, vol. 1, no. 11, 1999, pages 1811-1814, XP000914375 cited in the application the whole document -----	1-38, 53-61

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: not applicable

Present claims 1-52 and 53-61 relate to an extremely large number of possible compounds and methods, respectively. 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 and methods 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 compounds and methods disclosed in the examples and closely related compounds and methods mentioned in the description at pages 18 to 21.

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.

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