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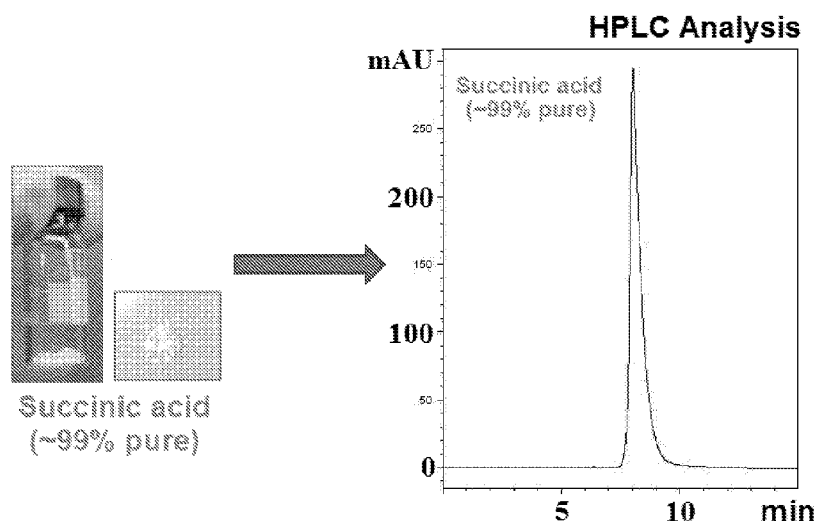
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[Continued on next page]

(54) Title: BACTERIAL STRAIN

Figure 4



(57) Abstract: The present disclosure relates to a bacterium capable of fermenting plant biomass amongst other carbon sources and methods that use the bacterium in the production of succinate and/or hydrogen.



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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 (Rule 48.2(h))*
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INTERNATIONAL SEARCH REPORT

 International application No.
PCT/SG2015/050250

A. CLASSIFICATION OF SUBJECT MATTER

C12P 7/46 (2006.01) C12P 3/00 (2006.01) C12N 1/22 (2006.01) C12R 1/22 (2006.01) C12R 1/145 (2006.01)

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)

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 practicable, search terms used)

EPODOC, WPIAP, TXPEA, TXPEB, TXPEC, TXPEE, TXPEF, TXPEH, TXPEI, TXPEP, TXPES, TXPEPEA, TXPUSE0A, TXPUSE1A, TXPUSEA, TXPUSEB, TXPWOEA, MEDLINE, CAPLUS, REGISTRY, BIOSIS, CABA, EMBASE, GOOGLE SCHOLAR & Keywords: Klebsiella, Clostridium, bacterium, lignocellulose, plant biomass, succinate, hydrogen, production, anaerobic, solid-state fermentation, and like terms; GenomeQuest & SEQ ID NO: 1;

EPODOC, WPIAP, MEDLINE, CAPLUS, REGISTRY, BIOSIS, CABA, EMBASE, AusPat, IP Australia Internal Databases & Keywords: Applicant and Inventor names, Klebsiella, Clostridium, bacterium, lignocellulose, plant biomass, succinate, hydrogen, production, anaerobic, solid-state fermentation, and like terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	



Further documents are listed in the continuation of Box C



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* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	"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
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"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 8 April 2016		Date of mailing of the international search report 08 April 2016	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au		Authorised officer Alexander Theodossis AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61 262832438	

INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		PCT/SG2015/050250
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CHENG, K.K. <i>et al.</i> , 'Effects of pH and dissolved CO ₂ level on simultaneous production of 2, 3-butanediol and succinic acid using <i>Klebsiella pneumoniae</i> ', Bioresource Technology, 2013, Vol. 135, pages 500-503 Abstract; para. bridging col.1-2 on p.500; Section 2.1; Figure 1; para.2 of col.1 on p.500	1-19
X	THAKKER, C. <i>et al.</i> , 'Isolation and characterization of a new osmotolerant, non-virulent <i>Klebsiella pneumoniae</i> strain SAP for biosynthesis of succinic acid', Indian Journal of Experimental Biology, 2006, Vol. 44, pages 142-150 Abstract; Tables 1, 2; para.2 of col.2 on p.142 to para.2 of col.2 on p.143; Figure 5; para.3 of col.2 on p.149; para.1 of col.1 on p.142; para.1 of col.1 on p.149	1-19
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X	WU, K.J. <i>et al.</i> , 'Converting glycerol into hydrogen, ethanol, and diols with a <i>Klebsiella</i> sp. HE1 strain via anaerobic fermentation', Journal of the Taiwan Institute of Chemical Engineers, 2011, Vol. 42, pages 20-25 Abstract	1-19
X	BRAMONO, S.E. <i>et al.</i> , 'A mesophilic <i>Clostridium</i> species that produces butanol from monosaccharides and hydrogen from polysaccharides', Bioresource Technology, 2011, Vol. 102, pages 9558-9563 Abstract; Sections 2.1, 4; para.5 of col.1 on p.9559; Figure 5; para.1 of col.2 on p.9562	16-18, 20
X	TAN, P.W.D., 'Isolation and characterization of <i>Clostridium succinogenum</i> , new species a cellulolytic thermophile', Acta Microbiologica Sinica, 1992, Vol. 32, pages 155-160 [retrieved from the internet on 1 April 2016] <URL: http://eurekamag.com/research/008/923/008923705.php > Abstract	16-18, 20
X	GUETTLER, M.V. <i>et al.</i> , ' <i>Actinobacillus succinogenes</i> sp. nov., a novel succinic-acid-producing strain from the bovine rumen', International Journal of Systematic Bacteriology, 1999, Vol. 49, pages 207-216 & GenBank Accession No. AF024525 3 March 1999 Abstract; para. bridging col.1-2 on p.208; para.5 of col.1 to para.2 of col.2 on p.210; Table 2; sequence in GenBank Accession No. AF024525 shares 83.1% identity with SEQ ID NO: 1	16-18
X	WO 2009/024294 A1 (BASF SE) 26 February 2009 Abstract; Sections 1, 2.3 of Example 1; Tables 7, 10; Figures 2, 7; SEQ ID NO: 1; Example 10; lines 7-10 on p.31	16-18
X	DU, C. <i>et al.</i> , 'A wheat biorefining strategy based on solid-state fermentation for fermentative production of succinic acid', Bioresource Technology, 2008, Vol. 99, pages 8310-8315 Abstract; Section 2.1; Table 2	16-18
P,X	XIN, F. <i>et al.</i> , 'Production of 2, 3-butanediol from sucrose by a <i>Klebsiella</i> species', Bioenergy Research, 2016, Vol. 9, pages 15-22 (available online 11 July 2015) Abstract; para.3 of col.1 to para.2 of col.2 on p.16	1-19
Form PCT/ISA/210 (fifth sheet) (July 2009)		

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing filed or furnished:
 - a. (means)
☐ on paper
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 - b. (time)
☒ in the international application as filed
☐ together with the international application in electronic form
☐ subsequently to this Authority for the purposes of search
2. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

INTERNATIONAL SEARCH REPORT		International application No.	
Information on patent family members		PCT/SG2015/050250	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
US 2003/0017559 A1	23 January 2003	US 2003017559 A1	23 Jan 2003
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		KR 101575912 B1	08 Dec 2015
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			
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INTERNATIONAL SEARCH REPORT Information on patent family members		International application No. PCT/SG2015/050250	
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Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
		US 2011008851 A1	13 Jan 2011
		US 8574875 B2	05 Nov 2013
		US 2014030778 A1	30 Jan 2014
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