

**1/19-FAMPAT-@QUESTEL-ORBIT**

- FAN - 20072080023735
- PN - **US2007172937** A1 20070726 [US20070172937]
  - STG:** Utility Patent Application published on or after January 2, 2001
  - AP :** 2007US-0725728 20070320
  - FD :** Divsn. of: US 09620060 - 20000721 [2000US-0620060] GRANTED
  - FD :** Divsn. of: US 7192772 - 0 [US7192772]
  - FD :** Cont. of: US 09134403 - 19980814 [1998US-0134403] GRANTED
  - FD :** Cont. of: US 6107093 - 0 [US6107093]
  - FD :** Cont. of: US 08363868 - 19941227 [1994US-0363868] GRANTED
  - FD :** Cont. of: US 5821093 - 0 [US5821093]
  - FD :** Cont. in part: US 08013658 - 19930204 [1993US-0013658] ABANDONED
  - FD :** Cont. of: US 07624227 - 19901207 [1990US-0624227] ABANDONED
  - FD :** Cont. in part: US 07352062 - 19890515 [1989US-0352062] GRANTED
  - FD :** Cont. in part: US 5000000 - 0 [US5000000]
  - FD :** Cont. in part: US 07239099 - 19880831 [1988US-0239099] ABANDONED
  - FD :** Cont. in part: US 07946290 - 19920917 [1992US-0946290] GRANTED
  - FD :** Cont. in part: US 5487989 - 0 [US5487989]
- TI - Recombinant cells that highly express chromosomally-integrated heterologous genes
- PA - UNIV FLORIDA
- PAO - University of Florida Research Foundation, Inc.; P.O.Box 115500, Gainesville, FL [US]
- IN - INGRAM LONNIE O; OHTA KAZUYOSHI; WOOD BRENT E
- AP - 2007US-0725728 20070320
- FD - (US20070172937)
  - Divsn. of: US 09620060 - 20000721 [2000US-0620060] GRANTED
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- PR - 1988US-0239099 19880831  
 1989US-0352062 19890515  
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 2007US-0725728 20070320
- IC - C12N-001/21  
 C12N-015/74
- ICAA - C12N-001/21 [2006-01 A F I B H US]; C12N-015/74 [2006-01 A L I B H US]
- ICCA - C12N-001/21 [2006 C F I B H US]; C12N-015/74 [2006 C L I B H US]
- EC - C12N-015/67  
 C12N-015/74
- PCL - ORIGINAL (O) : 435252330; CROSS-REFERENCE (X) : 435488000
- AB - (US20070172937)
  - Recombinant host cells are obtained that comprise (A) a heterologous, polypeptide-encoding polynucleotide segment, stably integrated into a chromosome, which is under transcriptional control of an endogenous promoter and (B) a mutation that effects increased expression of the heterologous segment, resulting in enhanced production by the host cells of each polypeptide encoded by that segment, relative to production of each polypeptide by the host cells in the

absence of the mutation. The increased expression thus achieved is retained in the absence of conditions that select for cells displaying such increased expression. When the integrated segment comprises, for example, ethanol-production genes from an efficient ethanol producer like *Zymomonas mobilis*, recombinant *Escherichia coli* and other enteric bacterial cells within the present invention are capable of converting a wide range of biomass-derived sugars efficiently to ethanol.

UP - 2007-30

**2/19-FAMPAT-@QUESTEL-ORBIT**

FAN - 20070800030262

PN - [US7192772](#) B1 20070320 [US7192772]

**STG:** U.S. Patent (no pre-grant pub.) after Jan. 2, 2001

**AP :** 2000US-0620060 20000721

**FD :** Cont. of US09134403 19980814 [1998US-0134403]

**FD :** Cont. of US08363868 19941217 [1994US-0363868]

**FD :** C.I.P. of US08013658 19930204 [1993US-0013658] (Abandoned)

**FD :** C.I.P. of US07946290 19920917 [1992US-0946290]

**FD :** Cont. of US07624227 19901207 [1990US-0624227] (Abandoned)

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**FD :** C.I.P. of US07239099 19880831 [1988US-0239099] (Abandoned)

**FD :** Continuation of: US6107093

**FD :** Continuation of: US5821093

**FD :** Continuation-in-part of: US5000000

**FD :** Continuation-in-part of: US5487989

TI - Recombinant cells that highly express chromosomally-integrated heterologous gene

PA - UNIV FLORIDA RES FOUNDATIONS I

PA0 - The University of Florida Research Foundations, Inc., Gainesville FL [US]

IN - INGRAM LONNIE O; OHTA KAZUYOSHI; WOOD BRENT E

AP - 2000US-0620060 20000721

FD - (US7192772)

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IC - C07H-021/00

C07H-021/04

C12N-001/20

C12N-015/00

ICAA - C12N-015/00 [2006-01 A F I B H US]; C07H-021/04 [2006-01 A L I B H US]; C12N-001/20 [2006-01 A L I B H US]

ICCA - C12N-015/00 [2006 C F I B H US]; C07H-021/00 [2006 C L I B H US]; C12N-001/20 [2006 C L I B H US]

PCL - ORIGINAL (O) : 435440000; CROSS-REFERENCE (X) : 435252300 435252330 536023700 536024100

- CT - (US7192772)  
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*coli*

- AB - (US7192772)  
 Recombinant host cells are obtained that comprise (A) a heterologous, polypeptide-encoding polynucleotide segment, stably integrated into a chromosome, which is under transcriptional control of an endogenous promoter and (B) a mutation that effects increased expression of the heterologous segment, resulting in enhanced production by the host cells of each polypeptide encoded by that segment, relative to production of each polypeptide by the host cells in the absence of the mutation. The increased expression thus achieved is retained in the absence of conditions that select for cells displaying such increased expression. When the integrated segment comprises, for example, ethanol-production genes from an efficient ethanol producer like *Zymomonas mobilis*, recombinant *Escherichia coli* and other enteric bacterial cells within the present invention are capable of converting a wide range of biomass-derived sugars efficiently to ethanol.
- UP - 2007-11

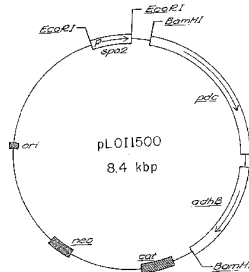
**3/19-FAMPAT-@QUESTEL-ORBIT**

- FAN - 20052080034900
- PN - [US2005158836](#) A1 20050721 [US20050158836]  
**STG:** Utility Patent Application published on or after January 2, 2001  
**AP :** 2004US-0009209 20041210  
**FD :** Cont. of: US 10001218 - 20011130 [2001US-0001218] GRANTED  
**FD :** Cont. of: US 6849434 - 0 [US6849434]  
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**FD :** Cont. of: US 08475925 - 19950607 [1995US-0475925] GRANTED  
**FD :** Cont. of: US 5916787 - 0 [US5916787]  
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**FD :** Cont. in part: US 07239099 - 19880831 [1988US-0239099] ABANDONED
- TI - Ethanol production in gram-positive microbes
- PA - UNIV FLORIDA
- PAO - University of Florida Research Foundation, Inc.; Gainesville, FL [US]
- IN - INGRAM LONNIE O; BARBOSA-ALLEYNE MARIA D F
- AP - 2004US-0009209 20041210
- FD - (US20050158836)  
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- IC - C12M-001/02  
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- ICAA - C12M-001/02 [2006-01 A - I R M EP]; C12N-009/04 [2006-01 A - I R M EP]; C12N-009/24 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12N-015/01 [2006-01 A - I R M EP]; C12N-015/52 [2006-01 A - I R M EP]; C12N-015/70 [2006-01 A - I R M EP]; C12N-015/74 [2006-01 A - I R M EP]; C12N-015/90 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]; C12P-007/10 [2006-01 A - I R M EP]; G06T-001/00 [2006-01 A - I R M EP]
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- EC - C12M-001/02  
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 C12P-007/10  
 G06T-001/00
- PCL - ORIGINAL (O) : 435161000; CROSS-REFERENCE (X) : 435252310
- AB - (US20050158836)  
 The subject invention concerns the transformation of Gram-positive bacteria with heterologous genes which confer upon these microbes the ability to produce ethanol as a fermentation product. Specifically exemplified is the transformation of bacteria with genes, obtainable from *Zymomonas mobilis*, which encode pyruvate decarboxylase and alcohol dehydrogenase.
- UP - 2005-29

**4/19-FAMPAT-©QUESTEL-ORBIT**



**FIG. 1**

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FAN - 20050470026987  
 PN - [US2003008363](#) A1 20030109 [US2003008363]  
**STG:** Utility Patent Application published on or after January 2, 2001  
**AP:** 2001US-0001218 20011130

[US6849434](#) B2 20050201 [US6849434]  
**STG:** U.S. Patent (with pre-grant pub.) after Jan. 2, 2001  
**FD:** Cont. of US09290463 19990412 [1999US-0290463] (Abandoned)  
**FD:** Cont. of US08475925 19950607 [1995US-0475925]  
**FD:** Cont. of US08220072 19940330 [1994US-0220072]  
**FD:** C.I.P. of US08026051 19930305 [1993US-0026051]  
**FD:** C.I.P. of US07946290 19920917 [1992US-0946290]  
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**FD:** C.I.P. of US07624227 19901207 [1990US-0624227] (Abandoned)  
**FD:** C.I.P. of US07352062 19890515 [1989US-0352062]  
**FD:** C.I.P. of US07239099 19880831 [1988US-0239099] (Abandoned)  
**FD:** Continuation of: US5916787  
**FD:** Continuation of: US5482846  
**FD:** Continuation-in-part of: US5554520  
**FD:** Continuation-in-part of: US5487989  
**FD:** Continuation-in-part of: US5424202  
**FD:** Continuation-in-part of: US5000000

TI - Ethanol production in gram-positive microbes  
 PA - UNIV FLORIDA  
 PA0 - University of Florida Research Foundation, Inc., Gainesville FL [US]  
 IN - INGRAM LONNIE O'NEAL; BARBOSA-ALLEYNE MARIA D F  
 AP - 2001US-0001218 20011130  
 FD - (US2003008363)  
 Cont. of US09290463 19990412 [1999US-0290463] (Abandoned)  
 Cont. of US08475925 19950607 [1995US-0475925]  
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- PR - 1988US-0239099 19880831
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- C12P-021/02
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- ICAA - C12M-001/02 [2006-01 A - I R M EP]; C12N-009/04 [2006-01 A - I R M EP]; C12N-009/24 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12N-015/01 [2006-01 A - I R M EP]; C12N-015/52 [2006-01 A - I R M EP]; C12N-015/70 [2006-01 A - I R M EP]; C12N-015/74 [2006-01 A - I R M EP]; C12N-015/90 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]; C12P-007/10 [2006-01 A - I R M EP]; G06T-001/00 [2006-01 A - I R M EP]
- ICCA - C12M-001/02 [2006 C - I R M EP]; C12N-009/04 [2006 C - I R M EP]; C12N-009/24 [2006 C - I R M EP]; C12N-009/88 [2006 C - I R M EP]; C12N-015/01 [2006 C - I R M EP]; C12N-015/52 [2006 C - I R M EP]; C12N-015/70 [2006 C - I R M EP]; C12N-015/74 [2006 C - I R M EP]; C12N-015/87 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]; G06T-001/00 [2006 C - I R M EP]
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- C12N-015/74
- C12N-015/90B
- C12P-007/06D
- C12P-007/10
- G06T-001/00
- PCL - ORIGINAL (O) : 435161000; CROSS-REFERENCE (X) : 435162000 435163000 435165000

- CT - 435252300 435252310 435320100  
(US20030008363)  
Cited; US5482846; US5916787; Cited; US4493893; US4612287; US4839286  
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AB

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(US20030008363)

The subject invention concerns the transformation of Gram-positive bacteria with heterologous genes which confer upon these microbes the ability to produce ethanol as a fermentation

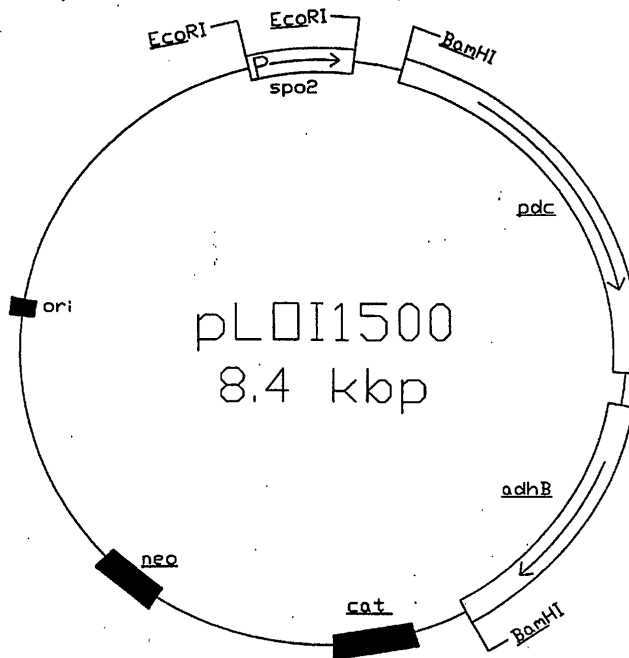
product. Specifically exemplified is the transformation of bacteria with genes, obtainable from *Zymomonas mobilis*, which encode pyruvate decarboxylase and alcohol dehydrogenase.

UP - 2003-05

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PN - [US2003008363](#) A1 20030109 [US2003008363]  
[US6849434](#) B2 20050201 [US6849434]  
 AP - US121801 20011130 [2001US-0001218]  
 ACT - 20070529 US/CC-A  
 CERTIFICATE OF CORRECTION  
 UP - 2007-25

**5/19-FAMPAT-©QUESTEL-ORBIT**



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FAN - 20042780163252  
 PN - [WO9527064](#) A1 19951012 [WO9527064]  
**STG:** Publ. Of int. Appl. With int. Search rep  
**AP:** 1995WO-US04012 19950330

[AU2203495](#) A 19951023 [AU9522034]  
**STG:** Open to public inspection  
**AP:** 1995AU-0022034 19950330

TI - ETHANOL PRODUCTION BY TRANSFORMATION OF GRAM-POSITIVE MICROBES  
 PA - UNIV FLORIDA  
 PA0 - THE UNIVERSITY OF FLORIDA; 186 Grinter Hall Gainesville, FL 32611 (US)  
 IN - BARBOSA-ALLEYNE MARIA DE F S; INGRAM LONNIE O'NEAL  
 AP - 1995AU-0022034 19950330  
 1995WO-US04012 19950330  
 PR - 1994US-0220072 19940330  
 1995WO-US04012 19950330

- IC - (Linked)  
C12N-001/21  
C12N-015/52  
C12N-015/53  
C12N-015/56  
C12N-015/60  
C12N-015/75  
C12P-007/02  
C12P-007/06  
C12R-001:12  
C12R-001:125
- ICAA - C12N-015/52 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]
- ICCA - C12N-015/52 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]
- EC - C12N-015/52  
C12P-007/06D
- DS - (WO9527064)  
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(OAPI Patent) NE (OAPI Patent) SN (OAPI Patent) TD (OAPI Patent) TG (OAPI Patent)
- CT - (WO9527064)  
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mobilis genes for ethanol production and plasmids expressing thermostable cellulase genes from  
Clostridium thermocellum' cited in the application(Cat. A,D)  
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BARBOSA ET AL 'Expression of the Zymomonas mobilis alcohol dehydrogenase II (adhB) and  
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MEETING OF THE AMERICAN SOCIETY FOR MICROBIOLOGY, WASHINGTON, D.C., USA,  
MAY 21-25 1995.(Cat. T)
- AB - (WO9527064)  
The subject invention concerns the transformation of Gram-positive bacteria with heterologous  
genes which confer upon these microbes the ability to produce ethanol as a fermentation  
product. Specifically exemplified is the transformation of bacteria with genes, obtainable from  
Zymomonas mobilis, which encode pyruvate decarboxylase and alcohol dehydrogenase.
- UP - 2000-08

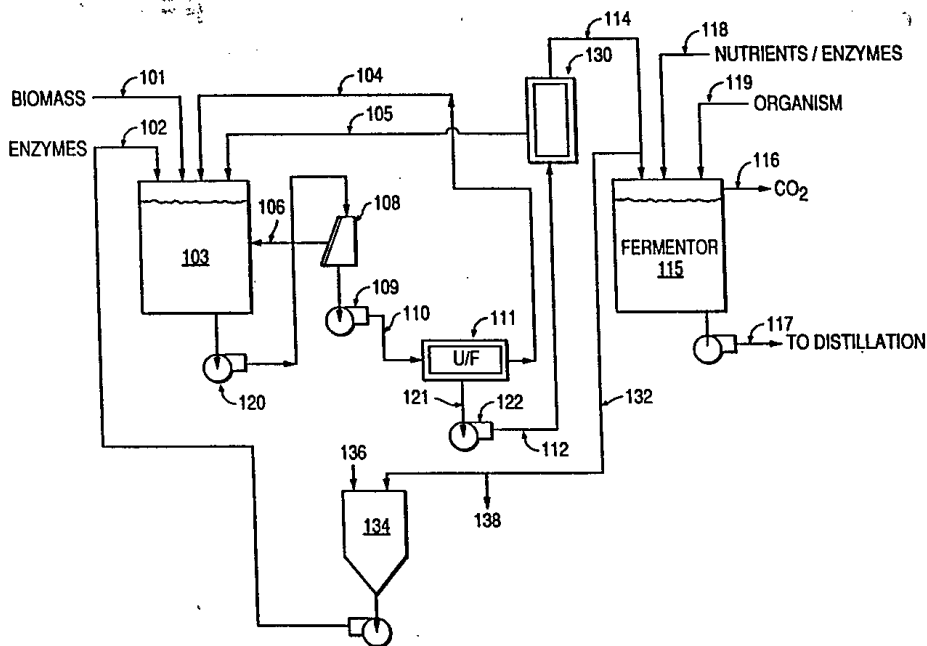
**1/1-LGST-©EPO**

- PN - [WO9527064](#) A1 19951012 [WO9527064]
- AP - WO9527064 19950330 [1995WO-US04012]
- ACT - 19951012 WO/AK [+]  
DESIGNATED STATES CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT  
AM AU BB BG BR BY CA CN CZ EE FI GE HU IS JP KG KP KR KZ LK LR LT LV MD MG MN  
MW MX NO NZ PL RO RU SG SI SK TJ TT UA UZ VN  
19951012 WO/AL [+]  
DESIGNATED COUNTRIES FOR REGIONAL PATENTS CITED IN A PUBLISHED  
APPLICATION WITH SEARCH REPORT  
KE MW SD SZ UG AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI  
CM GA GN ML MR NE SN TD TG  
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APPLICATION  
19951221 WO/DFPE  
REQUEST FOR PRELIMINARY EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH  
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19970716 WO/122 [-]  
EP: PCT APP. NOT ENT. EUROP. PHASE  
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NON-ENTRY INTO THE NATIONAL PHASE IN:  
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UP - 2003-22

**6/19-FAMPAT-©QUESTEL-ORBIT**



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FAN - 20042772234118  
PN - [WO9406924](#) A1 19940331 [WO9406924]  
**STG:** Publ. Of int. Appl. With int. Search rep  
**AP:** 1993WO-US08558 19930917

[AU5159893](#) A 19940412 [AU9351598]  
**STG:** Open to public inspection  
**AP:** 1993AU-0051598 19930917

[CN1091774](#) A 19940907 [CN1091774]  
**STG:** Unexamined application  
**AP:** 1993CN-0114096 19930917

[CN1068629](#) C 20010718 [CN1068629C]  
**STG:** Granted patent

TI - PROCESSES FOR ETHANOL PRODUCTION  
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 HORTON, Philip, G.; 1901 N.W. 67th Place, Suite E Gainesville, FL 32606 (US) (only US)  
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- IN - BEN-BASSAT ARIE; FOWLER DAVID E; HORTON PHILIP G  
 AP - 1993CN-0114096 19930917  
 1993AU-0051598 19930917  
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- PR - 1992US-0946290 19920917  
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- IC - C12N-015/52  
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 C12P-007/14
- ICAA - C12N-015/52 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]; C12P-007/10 [2006-01 A - I R M EP]
- ICCA - C12N-015/52 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]  
 EC - C12N-015/52  
 C12P-007/06D  
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- DS - (WO9406924)  
 AT AU BB BG BR BY CA CH CZ DE DK ES FI GB HU JP KP KR KZ LK LU LV MG MN MW NL  
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- AB - (WO9406924)  
 Novel plasmids comprising genes which code for alcohol dehydrogenase and pyruvate decarboxylase are described. Also described are recombinant hosts which have been

transformed with genes coding for alcohol dehydrogenase and pyruvate decarboxylase. By virtue of their transformation with these genes, the recombinant hosts are capable of producing significant amounts of ethanol as a fermentation product. Also disclosed are methods for increasing the growth of recombinant hosts and methods for reducing the accumulation of undesirable metabolic products in the growth medium of these hosts. Also disclosed are recombinant hosts capable of producing significant amounts of ethanol as a fermentation product of oligosaccharides and plasmids comprising genes encoding polysaccharases, in addition to the genes described above which code for alcohol dehydrogenase and pyruvate decarboxylase. Further, methods are described for producing ethanol from oligomeric feedstock using the recombinant hosts described above. Also provided is a method for enhancing the production of functional proteins in a recombinant host comprising overexpressing an adhB gene in the host. Further provided are process designs for fermenting oligosaccharide-containing biomass to ethanol.

UP - 2000-08

**1/1-LGST-©EPO**

PN - [WO9406924](#) A1 19940331 [WO9406924]  
 AP - WOUS9308558 19930917 [1993WO-US08558]  
 ACT - 19940331 WO/AK [+]  
 DESIGNATED STATES CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT  
 AT AU BB BG BR BY CA CH CZ DE DK ES FI GB HU JP KP KR KZ LK LU LV MG MN MW NL  
 NO NZ PL PT RO RU SD SE SK UA US VN  
 19940331 WO/AL [+]  
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 APPLICATION WITH SEARCH REPORT  
 AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR  
 NE SN TD TG  
 19940526 WO/COP  
 CORRECTED VERSION OF PAMPHLET  
 PAGES 1/22-22/22,DRAWINGS,REPLACED BY NEW PAGES 1/23-23/23;DUE TO LATE  
 TRANSMITTAL BY THE RECEIVINGOFFICE  
 19940623 WO/DFPE  
 REQUEST FOR PRELIMINARY EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH  
 MONTH FROM PRIORITY DATE  
 19940713 WO/121  
 EP: THE EPO HAS BEEN INFORMED BY WIPO THAT EP WAS DESIGNATED IN THIS  
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 19950727 WO/REG; DE/8642 [-]  
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 DE: WIRKUNG WEGGEFALLEN FUER DE  
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 19960207 WO/122 [-]  
 EP: PCT APP. NOT ENT. EUROP. PHASE  
 19960517 WO/NENP  
 NON-ENTRY INTO THE NATIONAL PHASE IN:  
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 19960814 WO/122 [-]  
 EP: PCT APP. NOT ENT. EUROP. PHASE  
 UP - 2003-22

**7/19-FAMPAT-©QUESTEL-ORBIT**

FAN - 20042770980571  
 PN - [CA2106377](#) A1 19920919 [CA2106377]  
 STG: Application laid open  
 AP : 1992CA-2106377 19920318  
  
[WO9216615](#) A1 19921001 [WO9216615]

**STG:** Publ. Of int. Appl. With int. Search rep  
**AP :** 1992WO-US01807 19920318

[AU1779492](#) A 19921021 [AU9217794]  
**STG:** Open to public inspection  
**AP :** 1992AU-0017794 19920318

NO933178 D0 19930907 [NO9303178]  
**STG:** Application filed  
**AP :** 1993NO-0003178 19930907

FI934087 D0 19930917 [FI9304087]  
**STG:** Application filed  
**AP :** 1993FI-0004087 19930917

[FI934087](#) A 19931102 [FI9304087]  
**STG:** Unex. Appli. Open to public inspec.

NO933178 A 19931108 [NO9303178]  
**STG:** Unex. Applic. Open to public inspec

[EP0576621](#) A1 19940105 [EP-576621]  
**STG:** Public. Of applic. With search report  
**AP :** 1992EP-0910933 19920318

[JP6505875](#) T 19940707 [JP06505875]  
**STG:** Unexam. Pat. Appl. On foreign appl.  
**AP :** 1992JP-0509941 19920318

BR9205782 A 19940726 [BR9205782]  
**STG:** Patent Application  
**AP :** 1992BR-0005782 19920318

NZ241970 A 19941026 [NZ-241970]  
**STG:** Comp. Specification accepted  
**AP :** 1992NZ-0241970 19920316

[EP0576621](#) A4 19941102 [EP-576621]  
**STG:** Publ. Of suppl. search report

[AU672748](#) B2 19961017 [AU-672748]  
**STG:** Patent preceded by A1

[AU7176396](#) A 19970206 [AU9671763]  
**STG:** Open to public inspection  
**AP :** 1996AU-0071763 19961113

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**STG:** Open to public inspection  
**AP :** 1997AU-0010176 19970115

[EP0576621](#) B1 20010228 [EP-576621]  
**STG:** Patent

[AT199389](#) T 20010315 [ATE199389]  
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**AP :** 1992AT-0910933 19920318

DE69231706 D1 20010405 [DE69231706]  
**STG:** Granted EP number in bulletin  
**AP :** 1992DE-6031706 19920318

ES2157203 T3 20010816 [ES2157203]  
**STG:** Transl. Compl. Txt. Of grted Eur. Pat.  
**AP :** 1992ES-0910933 19920318

DE69231706 T2 20011004 [DE69231706]  
**STG:** Trans. Of EP patent

NO315567 B1 20030922 [NO-315567]  
**STG:** Granted patents

JP3457664 B2 20031020 [JP3457664]  
**STG:** Grant. Pat. With A from 2500000 on

CA2106377 C 20031104 [CA2106377]  
**STG:** Patent

- TI - ETHANOL PRODUCTION BY RECOMBINANT HOSTS.
- PA - BC INTERNAT CORP  
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UNIV FLORIDA
- PA0 - UNIVERSITY OF FLORIDA; 223 Grinter Hall Gainesville, FL 32611 (US) (except US)  
BIOENERGY INTERNATIONAL, L.C.; 1901 N.W. 67th Place, Suite E Gainesville, FL 32601 (US) (except US)  
INGRAM, Lonnie, O.; 3132 N.W. 57th Terrace Gainesville, FL 32606 (US) (only US)  
BEALL, David, S.; 1101 S.W. 20th Place Gainesville, FL 32601 (US) (only US)  
BURCHHARDT, Gerhard, F., H.; 2701 N.W. 23rd Blvd., Apt. 78 Gainesville, FL 32605 (US) (only US)  
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WOOD, Brent, E.; 301 N.W. 13 Avenue, Apt. 5 Gainesville, FL 32601 (US) (only US)  
SHANMUGAM, Keelnatham, T.; 3215 N.W. 47th Place Gainesville, FL 32605 (US) (only US)  
FOWLER, David, A.; 1708 S.W. 56th Lane Gainesville, FL 32608 (US) (only US)  
BEN-BASSAT, Arie; 1901 N.W. 67th Place Gainesville, FL 32606 (US) (only US)
- IN - BEALL DAVID S; BEN-BASSAT ARIE; FOWLER DAVID A; INGRAM LONNIE O; OHTA KAZUYOSHI; WOOD BRENT E; BURCHHARDT GERHARD F H; GUIMARAES WALTER V; SHANMUGAM KEELNATHAM T
- AP - 1992NZ-0241970 19920316  
1992ES-0910933 19920318  
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C07H-015/12  
C12M-001/00  
C12M-001/02

C12N-001/00  
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 C12P-007/06  
 C12P-007/08  
 C12P-007/14  
 C12R-001:18  
 C12R-001:19  
 C12R-001:22  
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- ICAA - C12M-001/02 [2006-01 A - I R M EP]; C12N-009/04 [2006-01 A - I R M EP]; C12N-009/24 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]
- ICCA - C12M-001/02 [2006 C - I R M EP]; C12N-009/04 [2006 C - I R M EP]; C12N-009/24 [2006 C - I R M EP]; C12N-009/88 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]
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 C12N-009/24  
 C12N-009/88  
 C12P-007/06D
- DS - (EP-576621)  
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- DS - (WO9216615)  
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 (EP) NO PL RO RU SD SE SE (EP) SN (OAPI Patent) TD (OAPI Patent) TG (OAPI Patent) US
- CT - (EP-576621)  
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 See also references of WO 9216615A1
- CT - (WO9216615)  
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- AB - (WO9216615)  
 Novel plasmids comprising genes which code for the alcohol dehydrogenase and pyruvate decarboxylase are described. Also described are recombinant hosts which have been transformed with genes coding for alcohol dehydrogenase and pyruvate. By virtue of their transformation with these genes, the recombinant hosts are capable of producing significant amounts of ethanol as a fermentation product. Also disclosed are methods for increasing the growth of recombinant hosts and methods for reducing the accumulation of undesirable metabolic products in the growth medium of these hosts. Also disclosed are recombinant host capable of producing significant amounts of ethanol as a fermentation product of oligosaccharides and plasmids comprising genes encoding polysaccharases, in addition to the genes described above which code for the alcohol dehydrogenase and pyruvate decarboxylase. Further, methods are described for producing ethanol from oligomeric feedstock using the recombinant hosts described above. Also provided is a method for enhancing the production of functional proteins in a recombinant host comprising overexpressing an adhB gene in the host. Further provided are process designs for fermenting oligosaccharide-containing biomass to ethanol.
- UP - 2000-08

**1/9-LGST-©EPO**

- PN - DE69231706 D1 20010405 [DE69231706]  
 DE69231706 T2 20011004 [DE69231706]

AP - DE69231706 19920318 [1992DE-6031706]  
ACT - 20061109 DE/8364-A [+]  
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UP - 2006-45

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PN - NZ241970 A 19941026 [NZ-241970]  
AP - NZ24197092 19920316 [1992NZ-0241970]  
ACT - 20021025 NZ/RENW-A [+]  
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UP - 2007-06

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PN - [CA2106377](#) A1 19920919 [CA2106377]  
[CA2106377](#) C 20031104 [CA2106377]  
AP - CA2106377 19920318 [1992CA-2106377]  
ACT - 19930916 CA/AFNE-A [+]  
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UP - 2006-13

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PN - [AU1779492](#) A 19921021 [AU9217794]  
[AU672748](#) B2 19961017 [AU-672748]  
AP - AU1779492 19920318 [1992AU-0017794]  
ACT - 20000217 AU/DA2-A  
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20010215 AU/DA3-A  
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UP - 2006-48

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PN - BR9205782 A 19940726 [BR9205782]  
AP - BR9205782 19920318 [1992BR-0005782]  
ACT - 19950124 BR/EE-A [+]

REQUEST FOR EXAMINATION  
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19990810 BR/EG-A [-]  
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APPEAL AGAINST REFUSAL  
RECURSO CONTRA O INDEFERIMENTO  
20050712 BR/B08E-A  
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20050823 BR/B08H-A  
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UP - 2005-44

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PN - ES2157203 T3 20010816 [ES2157203]  
AP - ES92910933T 19920318 [1992ES-0910933]  
ACT - 20010816 ES/FG2A-T  
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(EP 576621 - [EP-576621])  
UP - 2003-22

#### 7/9-LGST-©EPO

PN - [AT199389](#) T 20010315 [ATE199389]  
AP - AT92910933T 19920318 [1992AT-0910933]  
ACT - 20010815 AT/RER-T [-]  
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UP - 2003-22

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PN - [WO9216615](#) A1 19921001 [WO9216615]  
AP - WO9216615 19920318 [1992WO-US01807]  
ACT - 19921001 WO/AK [+]  
DESIGNATED STATES CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT  
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RU SD SE US  
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APPLICATION WITH SEARCH REPORT  
AT BE BF BJ CF CG CH CI CM DE DK ES FR GA GB GN GR IT LU MC ML MR NL SE SN TD  
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19921112 WO/DFPE  
REQUEST FOR PRELIMINARY EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH  
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LATER ELECTION FOR INTERNATIONAL APPLICATION FILED PRIOR TO EXPIRATION OF  
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WIPO INFORMATION: ENTRY INTO NATIONAL PHASE

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19940127 WO/REG; DE/8642 [-]

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UP - 2007-40

**9/9-LGST-©EPO**

PN - [EP0576621](#) A1 19940105 [EP-576621]  
[EP0576621](#) A4 19941102 [EP-576621]  
[EP0576621](#) B1 20010228 [EP-576621]

AP - EP92910933 19920318 [1992EP-0910933]

ACT - 19940105 EP/AK-A [+]

DESIGNATED CONTRACTING STATES:

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AT BE CH DE DK ES FR GB GR IT LI LU MC NL SE

19940105 EP/17P-A [+]

REQUEST FOR EXAMINATION FILED

PRUEFUNGSANTRAG GESTELLT

EFFECTIVE DATE: 19931015

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DESIGNATED CONTRACTING STATES:

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AT BE CH DE DK ES FR GB GR IT LI LU MC NL SE

19941102 EP/A4-A [+]

SUPPLEMENTARY SEARCH REPORT

ERGAENZENDER RECHERCHENBERICHT

EFFECTIVE DATE: 19940916

19970730 EP/17Q-A [+]

FIRST EXAMINATION REPORT

ERSTER PRUEFUNGSBESCHIED

EFFECTIVE DATE: 19970611

20010228 EP/AK-A [+]

DESIGNATED CONTRACTING STATES:

BENANNT VERTRAGSSTAATEN

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20010706 EP/ET-A [+]  
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FR: TRADUCTION A ETE REMISE  
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UP - 2006-39

### 8/19-FAMPAT-@QUESTEL-ORBIT

FAN - 20042770980570

PN - [CN1070424](#) A 19930331 [CN1070424]

**STG:** Unexamined application

**AP:** 1992CN-0101877 19920318

[CN1065915](#) C 20010516 [CN1065915C]

**STG:** Granted patent

[CN1342773](#) A 20020403 [CN1342773]

**STG:** Unexamined application

**AP :** 2000CN-0131779 20001020

- TI - Ethanol production by recombinant hosts  
PA - UNIV FLORIDA & BIOENERGY INTER  
UNIV OF FLORIDE  
UNIV OF FLORIDE RES FOUNDATION  
IN - BEALL DAVID S; INGRAM LONNIE O; BURCHHARDT GERHARD F H  
AP - 1992CN-0101877 19920318  
2000CN-0131779 20001020  
PR - 1991US-0670821 19910318  
IC - C12N-015/53  
C12N-015/60  
C12N-015/63  
C12P-007/02  
C12P-007/06  
ICAA - C12N-015/53 [2006-01 A - I R M EP]; C12N-015/60 [2006-01 A - I R M EP]; C12N-015/63 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]  
ICCA - C12N-015/53 [2006 C - I R M EP]; C12N-015/60 [2006 C - I R M EP]; C12N-015/63 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]  
UP - 2000-08

#### 9/19-FAMPAT-©QUESTEL-ORBIT

- FAN - 20042770977393  
PN - [AU4744199](#) A 19991104 [AU9947441]  
**STG:** Open to public inspection  
**AP :** 1999AU-0047441 19990908  
TI - Ethanol production by recombinant hosts  
PA - BIOENERGY INT L C  
UNIV FLORIDA  
IN - GUIMJARAES WALTER V; BEALL DAVID S; INGRAM LONNIE; BEN-BASSAT ARIE; FOWLER DAVID E; OHTA KAZUYOSHI; WOOD BRENT E; BURCHHARDT GERHARD F H; SHANMUGAM KEELNATHAM T  
AP - 1999AU-0047441 19990908  
PR - 1991US-0670821 19910318  
1992US-0846344 19920306  
1997AU-0010176 19970115  
1999AU-0047441 19990908  
IC - C12N-001/21  
C12N-015/63  
C12N-015/74  
C12P-007/02  
C12P-007/14  
ICAA - C12N-001/21 [2006-01 A - I R M EP]; C12N-015/63 [2006-01 A - I R M EP]; C12N-015/74 [2006-01 A - I R M EP]; C12P-007/14 [2006-01 A - I R M EP]  
ICCA - C12N-001/21 [2006 C - I R M EP]; C12N-015/63 [2006 C - I R M EP]; C12N-015/74 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]  
UP - 2000-08

#### 10/19-FAMPAT-©QUESTEL-ORBIT

- FAN - 20042770775987  
PN - [CA2097803](#) A1 19920608 [CA2097803]  
**STG:** Application laid open  
**AP :** 1991CA-2097803 19911204

**WO9210561** A1 19920625 [WO9210561]  
**STG:** Publ. Of int. Appl. With int. Search rep  
**AP :** 1991WO-US08835 19911204

**AU9098891** A 19920708 [AU9190988]  
**STG:** Open to public inspection  
**AP :** 1991AU-0090988 19911204

**FI932559** D0 19930604 [FI9302559]  
**STG:** Application filed  
**AP :** 1993FI-0002559 19930604

**FI932559** A 19930727 [FI9302559]  
**STG:** Unex. Appli. Open to public inspec.

**EP0560885** A1 19930922 [EP-560885]  
**STG:** Public. Of applic. With search report  
**AP :** 1992EP-0901454 19911204

**BR9107210** A 19940208 [BR9107210]  
**STG:** Patent Application  
**AP :** 1991BR-0007210 19911204

**JP6504436** T 19940526 [JP06504436]  
**STG:** Unexam. Pat. Appl. On foreign appl.  
**AP :** 1991JP-0501565 19911204

**EP0560885** A4 19940608 [EP-560885]  
**STG:** Publ. Of suppl. search report

**AU668677** B2 19960516 [AU-668677]  
**STG:** Patent preceded by A1

**AU6194696** A 19961031 [AU9661946]  
**STG:** Open to public inspection  
**AP :** 1996AU-0061946 19960808

**AU694674** B2 19980723 [AU-694674]  
**STG:** Patent preceded by A1

**EP0560885** B1 19990317 [EP-560885]  
**STG:** Patent

**AT177784** T 19990415 [ATE177784]  
**STG:** EP Patent valid in AT  
**AP :** 1992AT-0901454 19911204

**DE69131015** D1 19990422 [DE69131015]  
**STG:** Granted EP number in bulletin  
**AP :** 1991DE-6031015 19911204

**ES2132116** T3 19990816 [ES2132116]  
**STG:** Transl. Compl. Txt. Of grted Eur. Pat.  
**AP :** 1992ES-0901454 19911204

**DK560885** T3 19991011 [DK-560885T]  
**STG:** Translations of EP patents  
**AP :** 1992DK-0901454 19911204

GR3030570 T3 19991029 [GR3030570]  
**STG:** Transl. Of EP patent  
**AP :** 1999GR-0401653 19990617

DE69131015 T2 19991118 [DE69131015]  
**STG:** Trans. Of EP patent

FI111552 B1 20030815 [FI-111552]  
**STG:** Patent

JP2004283176 A 20041014 [JP2004283176]  
**STG:** Doc. Laid open to publ. Inspec.  
**AP :** 2004JP-0147724 20040518

JP3593125 B2 20041124 [JP3593125]  
**STG:** Grant. Pat. With A from 2500000 on  
**AP :** 1992JP-0501565 19911204

- TI - RECOMBINANT CELLS THAT HIGHLY EXPRESS CHROMOSOMALLY-INTEGRATED HETEROLOGOUS GENES.
- PA - UNIV FLORIDA  
UNIV OF FLORIDA RES FOUNDATION
- PA0 - UNIVERSITY OF FLORIDA; 901-B1 NW 8 Avenue Gainesville, FL 32604 (US)
- IN - INGRAM LONNIE O; OHTA KAZUYOSHI
- AP - 1992JP-0501565 19911204  
1992DK-0901454 19911204  
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1992ES-0901454 19911204  
1991AU-0090988 19911204  
1992AT-0901454 19911204  
1991DE-6031015 19911204  
1991CA-2097803 19911204  
1991WO-US08835 19911204  
1992EP-0901454 19911204  
1991JP-0501565 19911204  
1993FI-0002559 19930604  
1996AU-0061946 19960808  
1999GR-0401653 19990617  
2004JP-0147724 20040518
- PR - 1990US-0624227 19901207  
1991WO-US08835 19911204
- IC - (Linked)  
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C12N-001/00  
C12N-001/19  
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C12N-005/10  
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- C12N-015/85
- C12N-015/87
- C12N-015/90
- C12P-007/02
- C12P-007/06
- C12R-001/19
- C12R-001:18
- C12R-001:19
- C12R-001:22
- ICAA - C12N-009/04 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12N-015/01 [2006-01 A - I R M EP]; C12N-015/70 [2006-01 A - I R M EP]; C12N-015/74 [2006-01 A - I R M EP]; C12N-015/90 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]
- ICCA - C12N-009/04 [2006 C - I R M EP]; C12N-009/88 [2006 C - I R M EP]; C12N-015/01 [2006 C - I R M EP]; C12N-015/70 [2006 C - I R M EP]; C12N-015/74 [2006 C - I R M EP]; C12N-015/87 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]
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- C12N-009/88
- C12N-015/01
- C12N-015/70
- C12N-015/74
- C12N-015/90B
- C12P-007/06D
- FI - C12N15/00 A; C12N1/21 ZNA
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- DS - (EP-560885)
- AT BE CH DE DK ES FR GB GR IT LI LU MC NL SE
- DS - (WO9210561)
- AT AT (EP) AU BB BE (EP) BF (OAPI Patent) BG BJ (OAPI Patent) BR CA CF (OAPI Patent) CG (OAPI Patent) CH CH (EP) CI (OAPI Patent) CM (OAPI Patent) CS DE DE (EP) DK DK (EP) ES ES (EP) FI FR (EP) GA (OAPI Patent) GB GB (EP) GN (OAPI Patent) GR (EP) HU IT (EP) JP KP KR LK LU LU (EP) MC (EP) MG ML (OAPI Patent) MN MR (OAPI Patent) MW NL NL (EP) NO PL RO SD SE SE (EP) SN (OAPI Patent) SU TD (OAPI Patent) TG (OAPI Patent)
- CT - (EP-560885)
- Cited in the search report
- No further relevant documents disclosed
- See also references of WO 9210561A1
- CT - (WO9210561)
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- US4551433(A)(Cat. Y)
- WHITNEY G.K. ET AL.: 'Induction of T4 DNA ligase in a recombinant strain of Escherichia coli' BIOTECHNOLOGY AND BIOENGINEERING vol. 33, March 1989, pages 991 - 998, XP002988507(Cat. Y)
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- ROEDEL W. ET AL.: 'Primary structures of Escherichia coli pyruvate formate-lyase and pyruvate-formate-lyase-activating enzyme deduced from the DNA nucleotide sequences' EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 177, October 1988, pages 153 - 158, XP002988511(Cat. Y)
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CONWAY T. ET AL.: 'Promoter and nucleotide sequences of the zymomonas mobilis pyruvate decarboxylase' J OF BACTERIOLOGY vol. 169, no. 3, March 1987, pages 949 - 954,

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BRAEU B. ET AL.: 'Cloning and expression of the structural gene for pyruvate decarboxylase of ymomonas mobilis in Escherichia coli' ARCH. I NMICROBIOLOGY vol. 144, June 1986, pages 296 - 301, XP002988512(Cat. Y)

ALAM K. ET AL.: 'Anaerobic Fermentation Balance of Escherichia coli as Observed by In Vivo Nuclear magnetic resonance spectroscopy' J OF BACTERIOLOGY vol. 171, no. 11, November 1989, pages 6213 - 6217, XP002988513(Cat. Y)

HAMILTON C.M. ET AL.: 'New Method for Generating Deletions and Gene Replacements in Escherichia coli' J OF BACTERIOLOGY vol. 171, no. 9, September 1989, pages 4617 - 4622, XP002119417(Cat. Y)

See also references of EP 0560885A1

AB - (WO9210561)

Recombinant host cells are obtained that comprise (A) a heterologous, polypeptide-encoding polynucleotide segment, stably integrated into a chromosome, which is under transcriptional control of an endogenous promoter and (B) a mutation that effects increased expression of the heterologous segment, resulting in enhanced production by the host cells of each polypeptide encoded by that segment, relative to production of each polypeptide by the host cells in the absence of the mutation. The increased expression thus achieved is retained in the absence of conditions that select for cells displaying such increased expression. When the integrated segment comprises, for example, ethanol-production genes from an efficient ethanol producer like Zymomonas mobilis, recombinant Escherichia coli and other enteric bacterial cells within the present invention are capable of converting a wide range of biomass-derived sugars efficiently to ethanol.

UP - 2000-08

### 1/7-LGST-©EPO

PN - [CA2097803](#) A1 19920608 [CA2097803]

AP - CA2097803 19911204 [1991CA-2097803]

ACT - 19930604 CA/AFNE-A [+]  
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UP - 2006-12

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PN - [AT177784](#) T 19990415 [ATE177784]

AP - AT92901454T 19911204 [1992AT-0901454]

ACT - 20030915 AT/REN-T [-]  
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UP - 2003-41

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PN - BR9107210 A 19940208 [BR9107210]  
AP - BR9107210 19911204 [1991BR-0007210]  
ACT - 20020205 BR/FB36-A [-]  
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UP - 2003-22

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PN - ES2132116 T3 19990816 [ES2132116]  
AP - ES92901454T 19911204 [1992ES-0901454]  
ACT - 19990816 ES/FG2A-T  
DEFINITIVE PROTECTION  
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(EP 560885 - [EP-560885])  
UP - 2003-22

#### 5/7-LGST-©EPO

PN - [WO9210561](#) A1 19920625 [WO9210561]  
AP - WO9210561 19911204 [1991WO-US08835]  
ACT - 19920625 WO/AK [+]  
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AT AU BB BG BR CA CH CS DE DK ES FI GB HU JP KP KR LK LU MG MN MW NL NO PL RO  
SD SE SU  
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DESIGNATED COUNTRIES FOR REGIONAL PATENTS CITED IN A PUBLISHED  
APPLICATION WITH SEARCH REPORT  
AT BE BF BJ CF CG CH CI CM DE DK ES FR GA GB GN GR IT LU MC ML MR NL SE SN TD  
TG  
19921126 WO/DFPE  
REQUEST FOR PRELIMINARY EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH  
MONTH FROM PRIORITY DATE  
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UP - 2007-40

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DE69131015 T2 19991118 [DE69131015]

AP - DE69131015 19911204 [1991DE-6031015]  
ACT - 20000316 DE/8363-A [-]  
OPPOSITION AGAINST THE PATENT  
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UP - 2003-22

### 7/7-LGST-©EPO

PN - EP0560885 A1 19930922 [EP-560885]  
EP0560885 A4 19940608 [EP-560885]  
EP0560885 B1 19990317 [EP-560885]  
AP - EP92901454 19911204 [1992EP-0901454]  
ACT - 19930922 EP/AK-A [+]  
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BENANNTE VERTRAGSSTAATEN  
AT BE CH DE DK ES FR GB GR IT LI LU MC NL  
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AT BE CH DE DK ES FR GB GR IT LI LU MC NL SE  
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MAIN CLASSIFICATION (CORRECTION)  
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C12N-015/31  
19940608 EP/A4-A [+]  
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19940608 EP/AK-A [+]  
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19950719 EP/17Q-A [+]  
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19990317 EP/AK-A [+]  
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OWNER: JACOBACCI & PERANI S.P.A.  
19990716 EP/ET-A [+]

FR: TRANSLATION FILED  
FR: TRADUCTION A ETE REMISE  
19990816 EP/REG-A; ES/FG2A  
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OPPOSITION FILED  
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20000308 EP/26-A [-]  
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OPPONENT: GENENCOR INTERNATIONAL INC.; EFFECTIVE DATE: 19991217  
20000403 EP/NLR1-A [-]  
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NL: EUROPESE OCTROOIEN, WAARTEGEN OPPOSITIE IS INGESTELD  
OPPONENT: NOVO INDUSTRI A/S  
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OPPONENT: NOVO NORDISK A/S \* 19991216 DSM N.V. \* 19991217 GE; EFFECTIVE DATE:  
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OPPONENT: NOVOZYMES A/S \* 19991216 DSM N.V. \* 19991217 GENEN; EFFECTIVE  
DATE: 19991217  
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OPPONENT: GENENCOR INTERNATIONAL INC.,  
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OPPONENT: NOVOZYMES A/S  
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OWNER: \*UNIVERSITY OF FLORIDA; EFFECTIVE DATE: 20021231  
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OPPOSITION FILED (CORRECTION)  
EINSPRUCH EINGELEGT (KORR.)  
OPPONENT: KONINKLIJKE DSM N.V.; EFFECTIVE DATE: 19991216  
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OPPOSITION FILED (CORRECTION)  
EINSPRUCH EINGELEGT (KORR.)  
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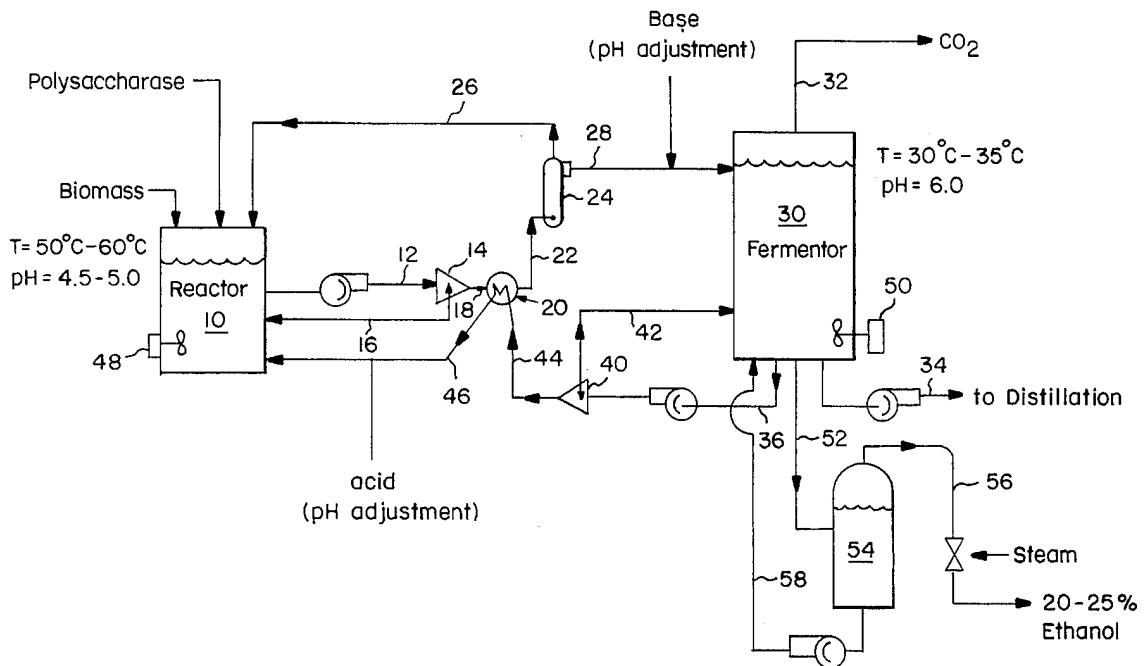
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UP - 2006-33  
EFFECTIVE DATE: 20030701

**11/19-FAMPAT-©QUESTEL-ORBIT**

- FAN - 20042770774328
- PN - [AU1858699](#) A 19990909 [AU9918586]  
  - STG: Open to public inspection
  - AP: 1999AU-0018586 19990305
- TI - Recombinant cells that highly express chromosomally- integrated heterologous genes
- PA - UNIV FLORIDA
- IN - INGRAM LONNIE O; OHTA KAZUYOSHI
- AP - 1999AU-0018586 19990305
- PR - 1990US-0624227 19901207  
1996AU-0061946 19960808
- IC - C12N-015/53  
C12N-015/60  
C12P-007/02  
C12P-007/06
- ICAA - C12N-015/53 [2006-01 A - I R M EP]; C12N-015/60 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]
- ICCA - C12N-015/53 [2006 C - I R M EP]; C12N-015/60 [2006 C - I R M EP]; C12P-007/02 [2006 C - I R M EP]
- UP - 2000-08

**12/19-FAMPAT-©QUESTEL-ORBIT**



FAN - 20042762123076  
 PN - **US5554520** A 19960910 [US5554520]  
     **STG:** United States patent  
     **AP :** 1993US-0026051 19930305  
     **FD :** C.I.P. of US946290 19920917 [1992US-0946290]  
     **FD :** C.I.P. of US846344 19920306 [1992US-0846344]  
     **FD :** C.I.P. of US670821 19910318 [1991US-0670821] (Abandoned)  
     **FD :** C.I.P. of US624277 19901207 [1990US-0624277] (Abandoned)  
     **FD :** C.I.P. of US352067 19890515 [1989US-0352067]  
     **FD :** C.I.P. of US239099 19880831 [1988US-0239099] (Abandoned)  
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     **FD :** Continuation-in-part of: US5487989  
     **FD :** Continuation-in-part of: US5424202  
     **FD :** Continuation-in-part of: US5000000  
 TI - Ethanol production by recombinant hosts  
 PA - BIOENERGY INT L C  
 PA0 - BioEnergy International, L.C., Gainesville FL [US]  
 IN - FOWLER DAVID E; HORTON PHILIP G; BEN-BASSAT ARIE  
 AP - 1993US-0026051 19930305  
 FD - (US5554520)  
     C.I.P. of US946290 19920917 [1992US-0946290]  
     C.I.P. of US846344 19920306 [1992US-0846344]  
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     C.I.P. of US624277 19901207 [1990US-0624277] (Abandoned)  
     C.I.P. of US352067 19890515 [1989US-0352067]  
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 IC - C12M-001/02  
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     C12N-015/52  
     C12P-007/02  
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     C12P-007/10  
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 ICAA - C12M-001/02 [2006-01 A - I R M EP]; C12N-009/04 [2006-01 A - I R M EP]; C12N-009/24 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12N-015/52 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]; C12P-007/10 [2006-01 A - I R M EP]; G06T-001/00 [2006-01 A - I R M EP]  
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PCL - G06T-001/00  
CT - ORIGINAL (O) : 435165000; CROSS-REFERENCE (X) : 435162000  
- (US5554520)  
Al-Zaag, A.; J. Biotechnol. 12:79-86 (1989).

Ohta, K. et al.; Applied Environ. Microbiol. 57:2810-2815 (1991).

Wong, W. K. R. et al.; Bio/Technology 6:713-719 (1988).

Esser, K. et al.; Proc. Biochem. 17(3):46-49 (1982).

Lawford, H. G. et al.; Biotechnol. Lett. 13:191-196 (1991).

Grepinet, O. et al.; J. Bacteriol. 170:4576-4581 (1988).

AB - Mes-Hartree, M. et al.; Biotechnol. Bioeng. 30:558-564 (1987).  
- (US5554520)  
Novel plasmids comprising genes which code for the alcohol dehydrogenase and pyruvate decarboxylase are have been transformed with genes coding for alcohol dehydrogenase and pyruvate. By virtue of their transformation with these genes, the recombinant hosts are capable of producing significant amounts of ethanol as a fermentation product. Also disclosed are methods for increasing the growth of recombinant hosts and methods for reducing the accumulation of undesirable metabolic products in the growth medium of these hosts. Also disclosed are recombinant host capable of producing significant amounts of ethanol as a fermentation product of oligosaccharides and plasmids comprising genes encoding polysaccharases, in addition to the genes described above which code for the alcohol dehydrogenase and pyruvate decarboxylase. Further, methods are described for producing ethanol from oligomeric feedstock using the recombinant hosts described above. Also provided is a method for enhancing the production of functional proteins in a recombinant host comprising overexpressing an adhB gene in the host. Further provided are process designs for fermenting oligosaccharide-containing biomass to ethanol.  
UP - 2000-08

### 1/1-LGST-©EPO

PN - [US5554520](#) A 19960910 [US5554520]

AP - US2605193 19930305 [1993US-0026051]

ACT - 19930430 US/AS02-A

ASSIGNMENT OF ASSIGNOR'S INTEREST

OWNER: BIOENERGY INTERNATIONAL, L.C. 1901 N.W. 67TH PLACE; EFFECTIVE DATE: 19930416

19930430 US/AS02-A

ASSIGNMENT OF ASSIGNOR'S INTEREST

OWNER: FOWLER, DAVID E.; EFFECTIVE DATE: 19930416

19930430 US/AS02-A

ASSIGNMENT OF ASSIGNOR'S INTEREST

OWNER: HORTON, PHILIP G.; EFFECTIVE DATE: 19930416

19930430 US/AS02-A

ASSIGNMENT OF ASSIGNOR'S INTEREST

OWNER: BEN-BASSAT, ARIE; EFFECTIVE DATE: 19930416

19961119 US/CC-A

CERTIFICATE OF CORRECTION

19980617 US/AS99-A

OTHER ASSIGNMENTS

BC INTERNATIONAL CORPORATION 990 WASHINGTON STREET, SUITE 104 DEDHAM,

MASSACHUSE \* BIOENERGY INTERNATIONAL L.C. : 19951115 OTHER CASES: NONE;

SALE AND ASSIGNMENT AGREEMENT DATED NOVEMBER 15, 1995 (ATTAC

20020215 US/AS-A

ASSIGNMENT

OWNER: PHILIP PLANT C/O PHILIP PLANT HERDON PLANT OAKLEY,; EFFECTIVE DATE:

20020214  
 SECURITY INTEREST;ASSIGNORS:BC INTERNATIONAL CORPORATION;BCI LOUISIANA  
 LLC;REEL/FRAME:012653/0509  
 20020215 US/AS-A  
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 OWNER: PHILIP PLANT C/O PHILIP PLANT HERDON PLANT OAKLEY,; EFFECTIVE DATE:  
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 SECURITY INTEREST;ASSIGNORS:BC INTERNATIONAL CORPORATION  
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 20060927 US/AS-A  
 ASSIGNMENT  
 OWNER: CELUNOL CORP., FLORIDA; EFFECTIVE DATE: 20060428  
 CHANGE OF NAME;ASSIGNOR:BC INTERNATIONAL  
 CORPORATION;REEL/FRAME:018313/0182  
 UP - 2007-09

**13/19-FAMPAT-@QUESTEL-ORBIT**

FAN - 20042762123075  
 PN - [US5487989](#) A 19960130 [US5487989]  
     **STG:** United States patent  
     **AP :** 1992US-0946290 19920917  
     **FD :** C.I.P. of US846344 19920306 [1992US-0846344]  
     **FD :** C.I.P. of US670821 19910318 [1991US-0670821] (Abandoned)  
     **FD :** US624277 19901207 [1990US-0624277] (Abandoned)  
     **FD :** US352062 19890515 [1989US-0352062]  
     **FD :** C.I.P. of US239099 19880831 [1988US-0239099] (Abandoned)  
     **FD :** US5000000  
 TI - Ethanol production by recombinant hosts  
 PA - BIOENERGY INT L C  
 PA0 - Bioenergy International, L.C., Gainesville FL [US]  
 IN - FOWLER DAVID E; HORTON PHILIP G; BEN-BASSAT ARIE  
 AP - 1992US-0946290 19920917  
 FD - (US5487989)  
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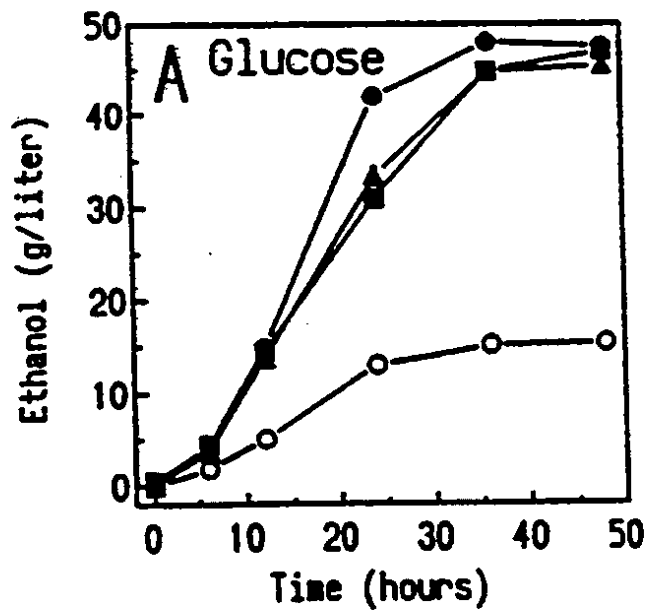
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- PCL - ORIGINAL (O) : 435165000; CROSS-REFERENCE (X) : 435162000 435209000 435252300  
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- CT - (US5487989)  
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Al-Zaag, J. *Biotechnol.* 12:79-86 (1989).
- Mes-Hartree et al., *Can. Bioenergy R. & D. Seminar (Proc.)*, 5th, 1984, pp. 469-472, Elsevier Appl. Sci, London.
- Ohta et al., *Appl. Env. Microbiol.* 57:2810-2815 (1991).
- Grepinet et al., *J. Bacteriol.* 170:4576-4581 (1988).
- Wong et al., *Bio/Technology* 6:713-719 (1988).
- Biely, *Trends Biotechnol.* 3:286-290 (1985).
- AB - Wood et al., *Appl. Env. Microbiol.* 58:12103-2110 (1992).  
(US5487989)  
Novel plasmids comprising genes which code for the alcohol dehydrogenase and pyruvate decarboxylase are described. Also described are recombinant hosts which have been transformed with genes coding for alcohol dehydrogenase and pyruvate. By virtue of their transformation with these genes, the recombinant hosts are capable of producing significant amounts of ethanol as a fermentation product. Also disclosed are methods for increasing the growth of recombinant hosts and methods for reducing the accumulation of undesirable metabolic products in the growth medium of these hosts. Also disclosed are recombinant host capable of producing significant amounts of ethanol as a fermentation product of oligosaccharides and plasmids comprising genes encoding polysaccharases, in addition to the genes described above which code for the alcohol dehydrogenase and pyruvate decarboxylase. Further, methods are described for producing ethanol from oligomeric feedstock using the recombinant hosts described above. Also provided is a method for enhancing the production of functional proteins in a recombinant host comprising overexpressing an adhB gene in the host. Further provided are process designs for fermenting oligosaccharide-containing biomass to ethanol.
- UP - 2000-08

### 1/1-LGST-©EPO

- PN - [US5487989](#) A 19960130 [US5487989]  
AP - US94629092 19920917 [1992US-0946290]  
ACT - 19940207 US/AS02-A  
ASSIGNMENT OF ASSIGNOR'S INTEREST  
OWNER: BIOENERGY INTERNATIONAL, L.C. 1901 N.W. 67TH PLACE; EFFECTIVE DATE: 19921103  
19940207 US/AS02-A  
ASSIGNMENT OF ASSIGNOR'S INTEREST  
OWNER: FOWLER, DAVID E.; EFFECTIVE DATE: 19921103

19940207 US/AS02-A  
 ASSIGNMENT OF ASSIGNOR'S INTEREST  
 OWNER: HORTON, PHILIP G.; EFFECTIVE DATE: 19921103  
 19940207 US/AS02-A  
 ASSIGNMENT OF ASSIGNOR'S INTEREST  
 OWNER: BEN-BASSAT, ARIE; EFFECTIVE DATE: 19921103  
 19980617 US/AS99-A  
 OTHER ASSIGNMENTS  
 BC INTERNATIONAL CORPORATION 990 WASHINGTON STREET, SUITE 104 DEDHAM,  
 MASSACHUSE \* BIOENERGY INTERNATIONAL L.C. : 19951115 OTHER CASES: NONE;  
 SALE AND ASSIGNMENT AGREEMENT DATED NOVEMBER 15, 1995 (ATTAC  
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 ASSIGNMENT  
 OWNER: PHILIP PLANT C/O PHILIP PLANT HERDON PLANT OAKLEY,;; EFFECTIVE DATE:  
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 SECURITY INTEREST;ASSIGNORS:BC INTERNATIONAL CORPORATION;BCI LOUISIANA  
 LLC;REEL/FRAME:012653/0509  
 20020215 US/AS-A  
 ASSIGNMENT  
 OWNER: PHILIP PLANT C/O PHILIP PLANT HERDON PLANT OAKLEY,;; EFFECTIVE DATE:  
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 SECURITY INTEREST;ASSIGNORS:BC INTERNATIONAL CORPORATION  
 /AR;REEL/FRAME:012653/0509  
 20060927 US/AS-A  
 ASSIGNMENT  
 OWNER: CELUNOL CORP., FLORIDA; EFFECTIVE DATE: 20060428  
 CHANGE OF NAME;ASSIGNOR:BC INTERNATIONAL  
 CORPORATION;REEL/FRAME:018313/0182  
 UP - 2007-09

**14/19-FAMPAT-©QUESTEL-ORBIT**



- FAN - 20042762123074  
 PN - **US5424202** A 19950613 [US5424202]  
     **STG:** United States patent  
     **AP :** 1992US-0846344 19920306  
     **FD :** C.I.P. of US670821 19910318 [1991US-0670821] (Abandoned)  
     **FD :** US624277 19901207 [1990US-0624277] (Abandoned)  
     **FD :** C.I.P. of US352062 19890515 [1989US-0352062]  
     **FD :** C.I.P. of US239099 19880831 [1988US-0239099] (Abandoned)  
     **FD :** Continuation-in-part of: US5000000
- TI - Ethanol production by recombinant hosts  
 PA - UNIV FLORIDA  
 PA0 - The University of Florida, Gainesville FL [US]  
 IN - INGRAM LONNIE O; CONWAY TYRRELL; ALTERTHUM FLAVIO  
 AP - 1992US-0846344 19920306  
 FD - (US5424202)  
     C.I.P. of US670821 19910318 [1991US-0670821] (Abandoned)  
     US624277 19901207 [1990US-0624277] (Abandoned)  
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     C12N-015/63  
     C12P-007/02  
     C12P-007/06  
     C12P-007/12  
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- ICAA - C12M-001/02 [2006-01 A - I R M EP]; C12N-009/04 [2006-01 A - I R M EP]; C12N-009/24 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12N-015/52 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]; G06T-001/00 [2006-01 A - I R M EP]
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- EC - C12M-001/02  
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- CT - (US5424202)  
     US4493893; US4612287; US4839286; US5000000  
     Raven, P. H. et al.; *Biology of Plants*, Worth Publishers, Inc., New York, 1981, pp. 251-255.
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- AB - Grepinet et al., "Nucleotide Sequence and Deletion Analysis of the Xylanase Gene (xynZ) of Clostridium thermocellum", J. Bacteriol., vol. 170, No. 10, Oct. 1988, pp. 4582-4588.  
(US5424202)  
Novel plasmids comprising genes which code for the alcohol dehydrogenase and pyruvate decarboxylase are described. Also described are recombinant hosts which have been transformed with genes coding for alcohol dehydrogenase and pyruvate. By virtue of their transformation with these genes, the recombinant hosts are capable of producing significant amounts of ethanol as a fermentation product. Also disclosed are methods for increasing the growth of recombinant hosts and methods for reducing the accumulation of undesirable metabolic products in the growth medium of these hosts. Also disclosed are recombinant host capable of producing significant amounts of ethanol as a fermentation product of oligosaccharides and plasmids comprising genes encoding polysaccharases, in addition to the genes described above which code for the alcohol dehydrogenase and pyruvate decarboxylase. Further, methods are described for producing ethanol from oligomeric feedstock using the recombinant hosts described above. Also provided is a method for enhancing the production of functional proteins in a recombinant host comprising overexpressing an adhB gene in the host. Further provided are process designs for fermenting oligosaccharide-containing biomass to ethanol.
- UP - 2000-08

#### 1/1-LGST-©EPO

- PN - [US5424202](#) A 19950613 [US5424202]  
AP - US84634492 19920306 [1992US-0846344]  
ACT - 19931008 US/AS02-A  
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OWNER: UNIVERSITY OF FLORIDA, THE 233 GRINTER HALL GAINES; EFFECTIVE DATE: 19930902  
19931008 US/AS02-A  
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OWNER: INGRAM, LONNIE O.; EFFECTIVE DATE: 19930902  
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ASSIGNMENT OF ASSIGNOR'S INTEREST  
OWNER: BEALL, DAVID S.; EFFECTIVE DATE: 19930907  
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OWNER: BURCHHARDT, GERHARD F.H.; EFFECTIVE DATE: 19930916  
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19960829 US/AS02-A  
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OWNER: FLORIDA, UNIVERSITY OF; EFFECTIVE DATE: 19960730  
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SECURITY INTEREST;ASSIGNORS:BC INTERNATIONAL CORPORATION;BCI LOUISIANA LLC;REEL/FRA:012653/0509  
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SECURITY INTEREST;ASSIGNORS:BC INTERNATIONAL CORPORATION

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- 2005-50

**15/19-FAMPAT-@QUESTEL-ORBIT**

FAN - 20042762123072  
PN - [US5482846](#) A 19960109 [US5482846]

**STG:** United States patent  
**AP :** 1994US-0220072 19940330  
**FD :** C.I.P. of US26051 19930305 [1993US-0026051]  
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**FD :** C.I.P. of US239099 19880831 [1988US-0239099] (Abandoned)  
**FD :** Continuation-in-part of: US5424202  
**FD :** Continuation-in-part of: US5000000

TI - Ethanol production in Gram-positive microbes  
PA - UNIV FLORIDA  
PA0 - University of Florida, Gainesville FL [US]  
IN - INGRAM LONNIE O; CONWAY TYRRELL; ALTERTHUM FLAVIO  
AP - 1994US-0220072 19940330  
FD - (US5482846)

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IC - C12M-001/02  
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ICAA - C12M-001/02 [2006-01 A - I R M EP]; C12N-009/04 [2006-01 A - I R M EP]; C12N-009/24 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12N-015/01 [2006-01 A - I R M EP]; C12N-015/52 [2006-01 A - I R M EP]; C12N-015/70 [2006-01 A - I R M EP]; C12N-015/74 [2006-01 A - I R M EP]; C12N-015/90 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP];

- ICCA - C12P-007/10 [2006-01 A - I R M EP]; G06T-001/00 [2006-01 A - I R M EP]  
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 Beall, D. S., L. O. Ingram (1993) "Genetic Engineering of Soft-rot Bacteria for Ethanol Production from Lignocellulose" J. Ind. Microbiol. 11:151-155.

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AB

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(US5482846)

The subject invention concerns the transformation of Gram-positive bacteria with heterologous genes which confer upon these microbes the ability to produce ethanol as a fermentation product. Specifically exemplified is the transformation of bacteria with genes, obtainable from Zymomonas mobilis, which encode pyruvate decarboxylase and alcohol dehydrogenase.

UP

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2000-08

## 1/1-LGST-©EPO

PN - [US5482846](#) A 19960109 [US5482846]

AP - US22007294 19940330 [1994US-0220072]

ACT - 19940330 US/AS02-A

ASSIGNMENT OF ASSIGNOR'S INTEREST

OWNER: UNIVERSITY OF FLORIDA 186 GRINTER HALL, GAINESVILLE; EFFECTIVE DATE: 19940329

19940330 US/AS02-A

ASSIGNMENT OF ASSIGNOR'S INTEREST

OWNER: INGRAM, LONNIE O'NEAL; EFFECTIVE DATE: 19940329

19940505 US/AS02-A

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OWNER: UNIVERSITY OF FLORIDA 186 GRINTER HALL GAINESVILLE; EFFECTIVE DATE: 19940404

19940505 US/AS02-A

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OWNER: BARBOSA-ALLEYNE, MARIA D.F.; EFFECTIVE DATE: 19940404

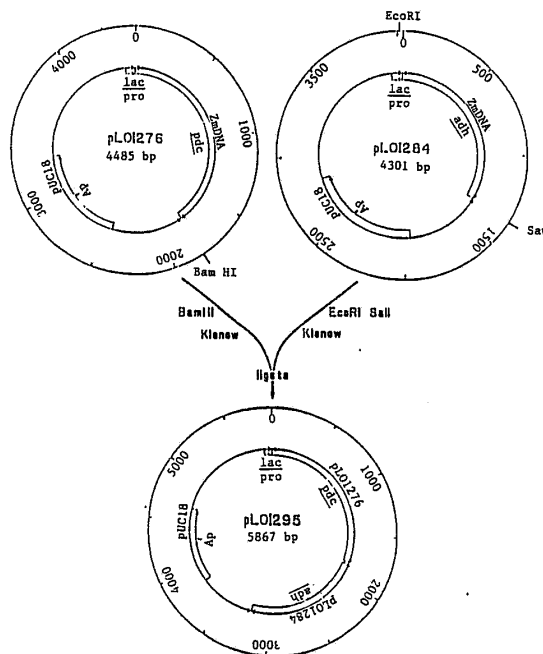
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CONFIRMATORY LICENSE

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UP - 2005-50

**16/19-FAMPAT-©QUESTEL-ORBIT**



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FAN - 20042762123071  
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**STG:** Publ. Of int. Appl. With int. Search rep  
**AP :** 1989WO-US03753 19890829

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**STG:** United States patent  
**AP :** 1989US-0352062 19890515  
**FD :** C.I.P. of US239099 19880831 [1988US-0239099] (Abandoned)

**EP0431047** A1 19910612 [EP-431047]  
**STG:** Public. Of applic. With search report  
**AP :** 1989EP-0909966 19890829

**US5028539** A 19910702 [US5028539]  
**STG:** United States patent  
**AP :** 1988US-0274075 19881121  
**FD :** C.I.P. of US239099 19880831 [1988US-0239099] (Abandoned)

**HU60328** A2 19920828 [HUT060328]  
**STG:** Examined patent application  
**AP :** 1989HU-0005771 19890829

**JP5502366** T 19930428 [JP05502366]  
**STG:** Unexam. Pat. Appl. On foreign appl.  
**AP :** 1989JP-0509287 19890829

**AR242634** A1 19930430 [AR-242634]  
**STG:** Independent patent application  
**AP :** 1989AR-0314798 19890830

**CA1335430** C 19950502 [CA1335430]  
**STG:** Patent  
**AP :** 1989CA-0609829 19890830

- TI - ETHANOL PRODUCTION BY GENETICALLY ENGINEERED ESCHERICHIA COLI STRAINS.
- PA - UNIV FLORIDA
- PA0 - UNIVERSITY OF FLORIDA; 207 Tigert Hall; Gainesville, Florida 32611 (US)
- IN - INGRAM LONNIE O; CONWAY TYRRELL; ALTERTHUM FLAVIO
- AP - 1988US-0274075 19881121  
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 1989WO-US03753 19890829  
 1989EP-0909966 19890829  
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- ICAA - C12N-001/21 [2006-01 A - I R M WO]; C12N-015/09 [2006-01 A L I R M JP]; C12N-015/52 [2006-01 A - I R M EP]; C12N-015/53 [2006-01 A - I R M WO]; C12P-007/06 [2006-01 A - I R M EP]; G06T-001/00 [2006-01 A - I R M EP]  
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- FI - C12N1/21; C12N15/00 A; C12P7/06; C12R1:19
- FTM - 4B064 AC03; 4B064 CA02; 4B064 CA19; 4B064 CC03; 4B064 CC24; 4B064 CD02; 4B064 CD09; 4B024 AA03; 4B024 BA07; 4B024 BA08; 4B024 BA80; 4B024 CA07; 4B024 DA06; 4B024 EA04; 4B024 FA04; 4B024 FA07; 4B024 FA08; 4B024 GA19; 4B065 AA01.Y; 4B065 AA26.X; 4B065 AA72.Y; 4B065 AB01; 4B065 AC14; 4B065 BA02; 4B065 BB03; 4B065 BB34; 4B065 CA06; 4B065 CA27
- DS - (EP-431047)  
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- CT - (US5000000)  
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A novel operon and plasmids comprising genes which code for the alcohol dehydrogenase and pyruvate decarboxylase activities of *Zymomonas mobilis* are described. Also disclosed are methods for increasing the growth of microorganisms or eukaryotic cells and methods for reducing the accumulation of undesirable metabolic products in the growth medium of microorganisms or cells.
- UP - 2000-08

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- PN - [US5000000](#) A 19910319 [US5000000]  
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 ACT - 19890515 US/AS02-A  
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**2/5-LGST-©EPO**

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AP - US27407588 19881121 [1988US-0274075]  
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20040927

MERGER;ASSIGNOR:HITACHI UNISIA AUTOMOTIVE, LTD. /AR;REEL/FRAME:016256/0342

UP - 2006-06

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PN - HU60328 A2 19920828 [HUT060328]

AP - HU577189 19890829 [1989HU-0005771]

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TEMPORARY PROT. CANCELLED DUE TO NON-PAYMENT OF FEE

UP - 2003-22

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PN - [WO9002193](#) A1 19900308 [WO9002193]

AP - WOUS8903753 19890829 [1989WO-US03753]

ACT - 19900308 WO/AK [+]

DESIGNATED STATES CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT

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UP - 2003-22

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DESIGNATED CONTRACTING STATES:

BENANNT VERTRAGSSTAATEN

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REQUEST FOR EXAMINATION FILED

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- PR - 1988US-0239099 19880831  
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- EC - C12M-001/02  
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- PCL - ORIGINAL (O) : 435161000; CROSS-REFERENCE (X) : 435162000 435163000 435165000  
435252310 435320100
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- AB - (US5916787)  
The subject invention concerns the transformation of Gram-positive bacteria with heterologous genes which confer upon these microbes the ability to produce ethanol as a fermentation product. Specifically exemplified is the transformation of bacteria with genes, obtainable from *Zymomonas mobilis*, which encode pyruvate decarboxylase and alcohol dehydrogenase.
- UP - 2000-08

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- PN - [US5916787](#) A 19990629 [US5916787]  
AP - US47592595 19950607 [1995US-0475925]  
ACT - 20020215 US/AS-A  
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EFFECTIVE DATE: 20030629  
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- FAN - 20042762122861
- PN - **US5821093** A 19981013 [US5821093]
  - STG:** United States patent
  - AP :** 1994US-0363868 19941227
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  - FD :** Cont. of US624227 19901207 [1990US-0624227] (Abandoned)
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- TI - Recombinant cells that highly express chromosomally-integrated heterologous genes
- PA - UNIV FLORIDA
- PAO - University of Florida Research Foundation, Inc., Gainesville FL [US]
- IN - INGRAM LONNIE O; OHTA KAZUYOSHI; WOOD BRENT E
- AP - 1994US-0363868 19941227
- FD - (US5821093)
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- ICAA - C12N-009/04 [2006-01 A - I R M EP]; C12N-009/88 [2006-01 A - I R M EP]; C12N-015/01 [2006-01 A - I R M EP]; C12N-015/52 [2006-01 A - I R M EP]; C12N-015/70 [2006-01 A - I R M EP]; C12N-015/74 [2006-01 A - I R M EP]; C12N-015/90 [2006-01 A - I R M EP]; C12P-007/06 [2006-01 A - I R M EP]; G06T-001/00 [2006-01 A - I R M EP]
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- PCL - ORIGINAL (O) : 435161000; CROSS-REFERENCE (X) : 435163000 435252300 435252330  
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- AB - (US5821093)  
Recombinant host cells are obtained that comprise (A) a heterologous, polypeptide-encoding polynucleotide segment, stably integrated into a chromosome, which is under transcriptional control of an endogenous promoter and (B) a mutation that effects increased expression of the heterologous segment, resulting in enhanced production by the host cells of each polypeptide encoded by that segment, relative to production of each polypeptide by the host cells in the absence of the mutation. The increased expression thus achieved is retained in the absence of conditions that select for cells displaying such increased expression. When the integrated segment comprises, for example, ethanol-production genes from an efficient ethanol producer like Zymomonas mobilis, recombinant Escherichia coli and other enteric bacterial cells within the present invention are capable of converting a wide range of biomass-derived sugars efficiently to ethanol.
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AB -

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