

## TRADEMARK ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

ETAS ID: TM607949

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT		
<b>NATURE OF CONVEYANCE:</b>	RELEASE OF SECURITY INTEREST		
<b>CONVEYING PARTY DATA</b>			
<b>Name</b>	<b>Formerly</b>	<b>Execution Date</b>	<b>Entity Type</b>
Oxford Finance LLC		11/09/2020	Limited Liability Company:
<b>RECEIVING PARTY DATA</b>			
<b>Name:</b>	Synthetic Genomics, Inc.		
<b>Street Address:</b>	11149 North Torrey Pines Road		
<b>City:</b>	La Jolla		
<b>State/Country:</b>	CALIFORNIA		
<b>Postal Code:</b>	92037		
<b>Entity Type:</b>	Corporation: DELAWARE		
<b>Name:</b>	Genovia Bio, LLC		
<b>Street Address:</b>	11149 North Torrey Pines Road		
<b>City:</b>	La Jolla		
<b>State/Country:</b>	CALIFORNIA		
<b>Postal Code:</b>	92037		
<b>Entity Type:</b>	Limited Liability Company: DELAWARE		
<b>Name:</b>	Green Resources, LLC		
<b>Street Address:</b>	11149 North Torrey Pines Road		
<b>City:</b>	La Jolla		
<b>State/Country:</b>	CALIFORNIA		
<b>Postal Code:</b>	92037		
<b>Entity Type:</b>	Limited Liability Company: MARYLAND		
<b>Name:</b>	SGI-DNA, Inc.		
<b>Street Address:</b>	11149 North Torrey Pines Road		
<b>City:</b>	La Jolla		
<b>State/Country:</b>	CALIFORNIA		
<b>Postal Code:</b>	92037		
<b>Entity Type:</b>	Corporation: DELAWARE		
<b>Name:</b>	Synthetic Genomics Vaccines, Inc.		
<b>Street Address:</b>	11149 North Torrey Pines Road		
<b>City:</b>	La Jolla		
<b>State/Country:</b>	CALIFORNIA		

CH \$365.00 85977312

TRADEMARK

Postal Code:	92037
Entity Type:	Corporation: DELAWARE

**PROPERTY NUMBERS Total: 14**

Property Type	Number	Word Mark
Serial Number:	85977312	GIBSON ASSEMBLY
Serial Number:	77218122	
Serial Number:	77217998	SYNTHETIC GENOMICS
Serial Number:	77218198	
Serial Number:	77218175	SYNTHETIC GENOMICS
Serial Number:	85256811	SYNTHETIC GENOMICS VACCINES
Serial Number:	85369384	X SGVI
Serial Number:	85369410	X SGVI SYNTHETIC GENOMICS VACCINES, INC.
Serial Number:	85173654	ARCHETYPE
Serial Number:	85173722	ARCHETYPE
Serial Number:	87545344	OSCELLA
Serial Number:	87545355	OSCELLA
Serial Number:	87890162	BIOXP
Serial Number:	88705882	VIRIDOS

**CORRESPONDENCE DATA**

Fax Number: 8586385010  
*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*  
Phone: 8586386756  
Email: aldon.griffis@dlapiper.com  
Correspondent Name: LISA A. HAILE, J.D., PH.D.  
Address Line 1: DLA PIPER LLP (US)  
Address Line 2: 4365 EXECUTIVE DRIVE, SUITE 1100  
Address Line 4: SAN DIEGO, CALIFORNIA 92121-2133

NAME OF SUBMITTER:	Lisa A. Haile, J.D., Ph.D.
SIGNATURE:	/Lisa A. Haile/
DATE SIGNED:	11/10/2020

**Total Attachments: 63**  
source=Release of Security Agreement (Oxford to SGI, Genovia Bio, Green Resources,I SGI-DNA, SG Vaccines)#page1.tif  
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source=Release of Security Agreement (Oxford to SGI, Genovia Bio, Green Resources,I SGI-DNA, SG Vaccines)#page4.tif





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RELEASE OF SECURITY AGREEMENT BETWEEN OXFORD FINANCE LLC AND SYNTHETIC GENOMICS COVERING INTERESTS IN SYNTHETIC GENOMICS, INC.

Oxford Finance LLC ('Secured Party'), hereby releases its security interest in the interests of SYNTHETIC GENOMICS, INC., a Delaware corporation ("Parent"), GENOVIA BIO, LLC, a Delaware limited liability company, GREEN RESOURCES, LLC, a Maryland limited liability company, SGI-DNA, INC., a Delaware corporation, and SYNTHETIC GENOMICS VACCINES, INC., a Delaware corporation (including Parent, individually and collectively, jointly and severally, "Synthetic Genomics, Inc"). in the patented and trademarked works set forth on Schedule A attached hereto, created by that certain Loan and Security Agreement dated as of July 31, 2017 executed by in favor of Secured Party recorded with the United States Patent and Trademark Office on March 20, 2019, in Reel/Frame 048655/0406 to 048655/0455 and on February 14, 2020, Reel/Frame 051820/0817 to 051820/0827.

Dated: November 9, 2020

Oxford Finance LLC

OXFORD FINANCE LLC, as Collateral Agent and Lender

By: 

Name: Colette H. Featherly

Title: Senior Vice President

SCHEDULE 'A'

USPTO Assignment Recordations

505385599 03/20/2019

**PATENT ASSIGNMENT COVER SHEET**

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5432392

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	SECURITY INTEREST
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
SYNTHETIC GENOMICS, INC.	03/07/2019
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	OXFORD FINANCE LLC
<b>Street Address:</b>	133 NORTH FAIRFAX STREET
<b>City:</b>	ALEXANDRIA
<b>State/Country:</b>	VIRGINIA
<b>Postal Code:</b>	22314
<b>PROPERTY NUMBERS Total: 91</b>	
<b>Property Type</b>	<b>Number</b>
Patent Number:	9556413
Patent Number:	8309323
Patent Number:	8114641
Patent Number:	8080188
Application Number:	12333280
Application Number:	13340350
Patent Number:	9758810
Patent Number:	7977056
Patent Number:	8448702
Patent Number:	8425946
Patent Number:	8968798
Patent Number:	8633002
Patent Number:	8124400
Patent Number:	8445257
Patent Number:	9181558
Patent Number:	8956834
Patent Number:	9920340
Patent Number:	8871525
Application Number:	13186319
Patent Number:	9528061

505385599

**PATENT**  
**REEL: 048655 FRAME: 0406**

**TRADEMARK**  
**REEL: 007102 FRAME: 0008**



Property Type	Number
Application Number:	13281270
Patent Number:	9441238
Patent Number:	9546372
Patent Number:	10131897
Application Number:	16193684
Application Number:	14720679
Patent Number:	9528133
Patent Number:	9982272
Patent Number:	9765126
Patent Number:	9909154
Patent Number:	9914931
Application Number:	15878243
Patent Number:	9447422
Patent Number:	9441020
Application Number:	15256460
Application Number:	14622671
Patent Number:	9932599
Application Number:	15916171
Application Number:	15299457
Application Number:	14986492
Application Number:	15066448
Application Number:	15394414
Application Number:	14809051
Application Number:	15328756
Application Number:	15005695
Application Number:	62702253
Application Number:	15365844
Application Number:	16056359
Application Number:	15341998
Application Number:	15210845
Application Number:	15130866
Application Number:	15417132
Patent Number:	10087181
Application Number:	15236144
Application Number:	15343064
Application Number:	16213928
PCT Number:	LIS2018064505
Application Number:	15460038

PATENT  
REEL: 048655 FRAME: 0407

TRADEMARK  
REEL: 007102 FRAME: 0009

Property Type	Number
Application Number:	16209655
PCT Number:	US2018063717
PCT Number:	US2015032308
Application Number:	15799785
Application Number:	15967202
Application Number:	15859094
Application Number:	15953286
Application Number:	62638796
Application Number:	62665187
Application Number:	16234209
Application Number:	62665270
Application Number:	62657489
Application Number:	62779364
Application Number:	62782152
Application Number:	15052781
Application Number:	14015070
Application Number:	13892087
Application Number:	15048862
Application Number:	15466675
Application Number:	15486131
Application Number:	15723858
Application Number:	15831230
Application Number:	16251928
PCT Number:	US2018066712
PCT Number:	US2017059304
PCT Number:	US2018030235
PCT Number:	US2018027650
PCT Number:	US2018060831
PCT Number:	US2018063920
PCT Number:	US2017027249
PCT Number:	US2017054928
PCT Number:	US2017064561
PCT Number:	US2019014210

**CORRESPONDENCE DATA**

Fax Number: (404)885-3900

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

Phone: 4048853868

PATENT  
REEL: 048655 FRAME: 0408

TRADEMARK  
REEL: 007102 FRAME: 0010

<b>Email:</b>	rusty.close@troutman.com
<b>Correspondent Name:</b>	CHRISTOPHER CLOSE
<b>Address Line 1:</b>	TROUTMAN SANDERS LLP
<b>Address Line 2:</b>	600 PEACHTREE STREET NE, SUITE 3000
<b>Address Line 4:</b>	ATLANTA, GEORGIA 30308-2216
<b>ATTORNEY DOCKET NUMBER:</b>	030690.000077
<b>NAME OF SUBMITTER:</b>	CHRISTOPHER C CLOSE, JR.
<b>SIGNATURE:</b>	/Christopher C. Close Jr./
<b>DATE SIGNED:</b>	03/20/2019
<b>Total Attachments: 45</b>	
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**PATENT**  
**REEL: 048655 FRAME: 0409**

**TRADEMARK**  
**REEL: 007102 FRAME: 0011**

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**PATENT**  
**REEL: 048655 FRAME: 0410**

**TRADEMARK**  
**REEL: 007102 FRAME: 0012**

## INTELLECTUAL PROPERTY SECURITY AGREEMENT

This Intellectual Property Security Agreement is entered into as of March 7, 2019, by and among OXFORD FINANCE LLC, a Delaware limited liability company with an office located at 133 North Fairfax Street, Alexandria, Virginia 22314 ("Oxford"), as collateral agent for the Lenders listed on Schedule 1.1 of the Loan Agreement (as defined below) or otherwise a party thereto from time to time (in such capacity, "Collateral Agent"), and SYNTHETIC GENOMICS, INC., a Delaware corporation ("Parent"), GENOVIA BIO, LLC, a Delaware limited liability company, GREEN RESOURCES, LLC, a Maryland limited liability company, SGI-DNA, INC., a Delaware corporation, and SYNTHETIC GENOMICS VACCINES, INC., a Delaware corporation (including Parent, individually and collectively, jointly and severally, "Borrower"), each with offices located at 11149 North Torrey Pines Road, La Jolla, CA 92037 (including Parent, individually and collectively, jointly and severally, "Grantor").

### RECITALS

A. The Lenders agreed to make certain advances of money and to extend certain financial accommodations to Grantor (the "Loans") in the amounts and manner set forth in that certain Loan and Security Agreement by and among the Collateral Agent, Lenders and Grantor dated as of July 31, 2017 (as amended, supplemented or otherwise modified from time to time, including, but without limitation, by that certain Forbearance Agreement, Consent and Third Amendment to Loan and Security Agreement dated as of March 7, 2019, the "Loan Agreement"; capitalized terms used but not otherwise defined herein shall have the meaning ascribed to such terms in the Loan Agreement). In accordance with the terms of the Loan Agreement, Grantor is granting to Collateral Agent, for the ratable benefit of the Lenders, a security interest in the Intellectual Property Collateral (as defined below) to secure the obligations of Grantor under the Loan Agreement.

B. Grantor has already granted to Collateral Agent, for the ratable benefit of the Lenders, a security interest in all of Grantor's right, title and interest, whether presently existing or hereafter acquired, in, to and under all of the Collateral.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, and intending to be legally bound, as collateral security for the prompt and complete payment when due of its obligations under the Loan Agreement, Grantor hereby represents, warrants, covenants and agrees as follows:

### AGREEMENT

To secure its obligations under the Loan Agreement, effective as of the date hereof, Grantor hereby grants and pledges to Collateral Agent, for the ratable benefit of the Lenders, a security interest in all of Grantor's right, title and interest in, to and under its intellectual property (all of which shall collectively be called the "Intellectual Property Collateral"), including, without limitation, the following:

(a) Any and all copyright rights, copyright applications, copyright registrations and like protections in each work or authorship and derivative work thereof, whether published or unpublished and whether or not the same also constitutes a trade secret, now or hereafter existing, created, acquired or held, including without limitation those set forth on Exhibit A attached hereto (collectively, the "Copyrights").

(b) Any and all trade secrets, and any and all intellectual property rights in computer software and computer software products now or hereafter existing, created, acquired or held;

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REEL: 007102 FRAME: 0013

(c) Any and all design rights that may be available to Grantor now or hereafter existing, created, acquired or held;

(d) All patents, patent applications and like protections including, without limitation, improvements, divisions, continuations, renewals, reissues, extensions and continuations-in-part of the same, including without limitation the patents and patent applications set forth on Exhibit B attached hereto (collectively, the "Patents");

(e) Any trademark and servicemark rights, whether registered or not, applications to register and registrations of the same and like protections, and the entire goodwill of the business of Grantor connected with and symbolized by such trademarks, including without limitation those set forth on Exhibit C attached hereto (collectively, the "Trademarks");

(f) All mask works or similar rights available for the protection of semiconductor chips, now owned or hereafter acquired, including, without limitation those set forth on Exhibit D attached hereto (collectively, the "Mask Works");

(g) Any and all claims for damages by way of past, present and future infringements of any of the rights included above, with the right, but not the obligation, to sue for and collect such damages for said use or infringement of the intellectual property rights identified above;

(h) All licenses or other rights to use any of the Copyrights, Patents, Trademarks, or Mask Works and all license fees and royalties arising from such use to the extent permitted by such license or rights;

(i) All amendments, extensions, renewals and extensions of any of the Copyrights, Trademarks, Patents, or Mask Works; and

(j) All proceeds and products of the foregoing, including without limitation all payments under insurance or any indemnity or warranty payable in respect of any of the foregoing.

Notwithstanding the right to sue and collect granted in clause (g) above, Collateral Agent shall not exercise such right to sue and collect unless (i) an Event of Default has occurred and is continuing, or (ii) Grantor has failed to pursue such claim within ten (10) days of a determination by Grantor and Collateral Agent that the pursuit of such claim is necessary to preserve the value of, or prevent any further diminution of value to, the underlying Intellectual Property Collateral.

Grantor hereby represents and warrants that the Copyrights set forth on Exhibit A, the Patents set forth on Exhibit B and the Trademarks set forth on Exhibit C include all Copyrights, Patents and Trademarks of Grantor and its Subsidiaries that are either registered, or for which applications for registration or grant, as applicable, are pending, on the date hereof. Grantor hereby covenants to provide prompt notice of (A) any material change in the composition of the Intellectual Property, and (B) any new Copyrights, Trademarks, Patents, or Mask Works of Grantor or any of its Subsidiaries that are either registered or for which an application for registration or grant is filed.

This security interest is granted in conjunction with the security interest granted to Collateral Agent, for the ratable benefit of the Lenders under the Loan Agreement, and shall become effective upon the date hereof. The rights and remedies of Collateral Agent with respect to the security interest granted hereby are in addition to those set forth in the Loan Agreement and the other Loan Documents, and those which are now or hereafter available to Collateral Agent as a matter of law or equity. Each right, power and remedy of Collateral Agent provided for herein or in the Loan Agreement or any of the Loan Documents, or now

or hereafter existing at law or in equity shall be cumulative and concurrent and shall be in addition to every right, power or remedy provided for herein and the exercise by Collateral Agent of any one or more of the rights, powers or remedies provided for in this Intellectual Property Security Agreement, the Loan Agreement or any of the other Loan Documents, or now or hereafter existing at law or in equity, shall not preclude the simultaneous or later exercise by any person, including Collateral Agent, of any or all other rights, powers or remedies.

This Intellectual Property Security Agreement may be executed in several counterparts, each of which shall constitute an original and all of which, when taken together, shall constitute one agreement. The exchange of a fully executed Intellectual Property Security Agreement (in counterparts or otherwise) by electronic transmission in .PDF format or by facsimile shall be sufficient to bind the parties to the terms and conditions of this Intellectual Property Security Agreement.

[Signature page follows.]

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**PATENT**  
**REEL: 048655 FRAME: 0413**

**TRADEMARK**  
**REEL: 007102 FRAME: 0015**

IN WITNESS WHEREOF, the parties have caused this Intellectual Property Security Agreement to be duly executed by its officers thereunto duly authorized as of the first date written above.

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

GRANTOR:

SYNTHETIC GENOMICS, INC.

By: 

Title: CEO

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

GENOVIA BIO, LLC

By: 

Title: CEO of Synthetic Genomics, Inc.  
Its: Sole Member

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

GREEN RESOURCES, LLC

By: 

Title: CEO of Synthetic Genomics, Inc.  
Its: Sole Member

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

SYNTHETIC GENOMICS VACCINES, INC.

By: 

Title: CEO

{Signature Page - Intellectual Property Security Agreement}

PATENT  
REEL: 048655 FRAME: 0414

TRADEMARK  
REEL: 007102 FRAME: 0016



Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

SGL-DNA, INC.

By:

Title: CEO of Synthetic Genomics, Inc.  
Ikt: Sole Stockholder

Address of Collateral Agent:

133 North Fairfax Street  
Alexandria, Virginia 22314  
Attn: Legal Department

COLLATERAL AGENT:

OXFORD FINANCE LLC, AS COLLATERAL  
AGENT

By:

Title:

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

SGI-DNA, INC.

By: \_\_\_\_\_

Title: \_\_\_\_\_

Address of Collateral Agent:

133 North Fairfax Street  
Alexandria, Virginia 22314  
Attn: Legal Department

COLLATERAL AGENT:

OXFORD FINANCE LLC, AS COLLATERAL  
AGENT

By: 

Collette H. Featherly

Title: Senior Vice President

EXHIBIT A

Copyrights

Description

Registration/  
Application  
Number

Registration/  
Application  
Date

80348830V3

**PATENT**  
**REEL: 048655 FRAME: 0417**

**TRADEMARK**  
**REEL: 007102 FRAME: 0019**

EXHIBIT B

Patents

36048333VQ

PATENT

REEL: 048655 FRAME: 0418

TRADEMARK

REEL: 007102 FRAME: 0020

SGI IP Portfolio  
February 2019

UP=US Pending    US Issued  
FP=Foreign Pending    CP=Converted  
N1=Not Pinned    EQ=EP Granted  
FG=Foreign Granted

Qty	Use	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
AU		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Venter, J. Craig Mathur, Eric J. Toledo, Gerardo V. Chang, Hwai, W. Guan, Wayne A.	2008228722 03/21/08		2008326722 10/03/13
AU		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Dudna, Corey	2008335089 12/11/08		2008335089 10/09/14
AU	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Toledo, Gerardo V. Richardson, Toby Singh, Ulrich Mathur, Eric J. Venter, J. Craig	2009246493 05/12/09		2009246493 05/03/14
AU		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	2009324539 12/10/09		2009324539 01/14/16
AU		Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Clement, Brian G. Ferry, James G. Underwood, Stuart	2011361306 06/03/11		2011361306 09/01/16
AU	HSTO	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovuo, Janne S. McCann, Ryan T.	2011325740 10/25/11		2011325740 04/07/16
AU	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandt, Christopher J. Kerovuo, Janne S. Richardson, Toby H. Schwartz, Ariel S.	2018208012 08/17/12	2018206012 01/25/18	
AU		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby H.	2013214771 02/01/13	2013214771 08/08/13	2013214771 12/21/17
AU		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby H.	2017272306 02/01/13		
AU		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhong Liang, Jun Calazza, Nicky C. Gibson, Daniel G.	2013358293 12/11/13		2013358293 02/15/18
AU		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. GBL, John E.	2013302376 08/16/13	2013302376 03/12/15	2013302376 06/07/18
AU		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. GBL, John E.	2016208085 09/16/13		
AU		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambouakis, Spiros Griffin, Benjamin Martin, Kevin V.	2013317782 09/20/13		2013317782 01/19/17
AU		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambouakis, Spiros Griffin, Benjamin Martin, Kevin V.	2015231000 03/20/15		2015231000 02/08/18
AU		Algal Mutants Having a Lock-In High Light Acclimatize Phenotype	Bailey, Shaun McCann, Jay L. Lieberman, Soyan Meuser, Jonathan E. Romano, Anna E. Yee, Daniel Sotlega, Leah Brown, Robert C. Weissman, Joseph C. Printz, Robert C. Hobson, Robert D.	2013355001 12/06/13	2013355001 06/04/15	2013355001 02/08/18

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SGI IP Portfolio  
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Cty	Use	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
AU		Regulatory Elements from Labyrinthulomycetes Microorganisms	Caiazza, Nicky C. Win, Maung N. Urano, Jun	2016228418 02/29/16		
AU		Compositions and Methods for High Efficiency In vivo Genome Editing	Verruto, John H. Moellering, Eric R.	2015373883 11/31/15		
AU		Microorganisms for Fatty Acid Production Using Bionase and Desaturase Enzymes	Caiazza, Nicky Felnagle, Elizabeth Urano, Jun Win, Maung Nyan Radakovits, Randor R.	2016228545 03/11/16		
AU		Tamper-Resistant Assembly for Securing Valuable Material	Warden, Laurence Newman-Lehman, Tai Gibson, Daniel G.	2015252926 05/01/15		
AU		Lid Mechanism	Warden, Laurence Beaver, Scott Wayne Berker, Mark Henry	2015289674 07/15/15		
AU		Algal Mutants with Increased Lipid Productivity	Ajawi, Imad Sorjaga, Leah Aqui, Moena Moellering, Eric R.	2016349822 11/02/16		
AU		Microorganisms having Increased Lipid Productivity	Ajawi, Imad Moellering, Eric R. Sorjaga, Leah Aqui, Moena	2016293527 07/14/16		
AU		Algal Chloroplastic GFP94 Mutants	Dipertito, Chester McCarren, Jay Sorjaga, Leah	2016249402 04/15/16		
AU		Protein Containing Material from Biomass and Methods of Production	Schotten, Johannes Lakshminaraswamy, A Burke, Joel Ruff, George C.	01/26/17		
AU		Production of Proteins in Labyrinthulomycetes	Caiazza, Nicky C. Urano, Jun Win, Maung N. Boles, Kent S.	2017235843 3/15/17		
AU	SGVI	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	2006242387 05/31/06		2006242387 04/21/11
AU	SGVI	Minimal Bacteria Genome	Glass, John I. Smith, Hamilton O. Hutchison, Clyde A. Alperovich, Nina Y. Assad-Garcia, Nancy	2013200532 10/12/06		2013200532 01/07/16
AU	SGVI	Synthesis of Error-Minimized Nucleic Acid Molecules	Young, Lei	2006330275 12/04/08		2006330275 06/20/12
AU	SGVI	Installation of Genomes or Partial Genomes into Cells or Cell-Like Systems	Glass, John I. Young, Lei Lartigue, Carole Assad-Garcia, Nancy Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig	2006346810 12/22/06		2006346810 03/15/13
AU	SGVI	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.	2006347573 12/06/06	2006347573 03/28/08	2006347573 06/02/13
AU	SGVI	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Gwynedd A. Young, Lei Glass, John I. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	2008311000 10/07/08	2008311000 04/16/09	2008311000 04/03/14

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Cty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
AU	SGV3	Methods of Genome Installation in a Recipient Host Cell	Larigue, Carole Glass, John L. Aizerovich, Mira Hutchison, Clyde A. Smith, Hamilton O. Venner, J. Craig Merryman, Charles Vashee, Santay	2008254291 05/01/08	2008254291 11/27/08	2008254291 01/07/16
AU	SGV3	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venner, J. Craig	2009214435 02/13/09		2009214435 08/21/14
AU	SGV3	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John L. Hutchison, Clyde A. Larigue, Carole Vashee, Santay Aigre, Mikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venner, J. Craig Gibson, Daniel G.	2010221172 03/05/10		2010221172 08/17/15
AU	SGV3	Encoding Text into Nucleic Acid Sequences	Hutchison, Clyde A. Montague, Michael G. Smith, Hamilton O.	2016210593 10/29/16		
AU		Microbial Fuel Cell	Bretschger, Christina Wagner, Greg	2013259188 05/10/13		2013259188 06/14/18
AU	SGT	Method for Producing Polymers	Stahler, Peter F. Stahler, Carl F. Muller, Manfred	2000031570 02/18/00	767606 11/20/03	767606 03/09/04
AU		Recombinant Arterivirus Replicon Systems and Uses Thereof	Kammud, Kurt Wang, Nathaniel S. Felderman, Martina Carino, Nancy	2017249424 10/05/18		
BR		Secretion of Fatty Acids by Photosynthetic Microorganisms	Koessler, Paul Chen, You Liu, Bo Ding, Corey	PI0621508 12/11/08		
BR	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Toledo, Gerardo V. Richardson, Toby Sungl, Ulrich Malkun, Eric J. Venner, J. Craig	PI0912617 05/12/09		
BR	AGRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strobel, Gary A.	PI1010302-3 04/02/10	PI1010302-3 06/27/17	
BR		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Koessler, Paul G. Liu, Bo Kristof, Jessica R.	PI0622735 12/18/08	PI0622735 06/13/17	
BR	HSTQ	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovuo, Janne S. McCann, Ryan T.	BR1120130097132 10/25/11		
BR	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandic, Christopher J. Kerovuo, Janne S. Richardson, Toby H. Schwarz, Ariel S.	BR112014003911-9 08/17/12	BR112014003911-9 03/14/17	
BR		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambrakis, Spiros Griffin, Benjamin Martin, Kevin V.	112015006255-5 08/20/13	112015006255-5 06/22/17	

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Clty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
BR		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarren, Jay L. Lieberman, Soyant Reuser, Jonathan E. Romano, Anna E. Yee, Daniel Srinaga, Leah Brown, Robert C. Weissman, Joseph C. Rince, Robert C.	BR112019013013-5 12/06/13	BR112019013013-5 09/12/17	
BR	SGVI	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	PT0607661 05/03/08	PT0607661 11/09/08	PT0607661 08/06/17
BR	SGVI	Encoding Text into Nucleic Acid Sequences	Hutchison, Clyde A. Montague, Michael G. Smith, Hamilton O.	112012010535-3 10/29/10		
CA		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Venter, J. Craig Mathur, Eric J. Toledo, Gerardo V. Chang, Hwai, W. Green, Wayne A.	2681648 03/21/08		2681648 08/12/15
CA	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Toledo, Gerardo V. Richardson, Toby Stigli, Ulrich Mathur, Eric J. Venter, J. Craig	2724074 05/12/09		2724074 04/12/16
CA	AGRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strobel, Gary A.	2757537 01/02/10	2757537 10/07/10	
CA		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	2746441 12/10/09		2746441 05/15/16
CA		Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Clement, Brian G. Ferry, James G. Underwood, Stuart	2801558 06/03/11		
CA	METO	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovuo, Janne S. McCann, Ryan T.	2832308 10/25/11		
CA	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandic, Christopher J. Kerovuo, Janne S. Richardson, Toby H. Schwartz, Ariel S.	2844913 08/17/12	2844913 02/28/13	
CA		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Interclides	Gibson, Daniel G. Caiazza, Nicky Richardson, Toby H.	2862149 02/01/13		
CA		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhiqing Urata, Jun Caiazza, Nicky C. Gibson, Daniel G.	2893817 12/11/13		
CA		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gill, John E.	2880687 08/16/13	2880687 02/20/14	
CA		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambouris, Spiros Griffin, Benjamin Martin, Kevin V.	2825662 09/20/13		
CA		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambouris, Spiros Griffin, Benjamin Martin, Kevin V.	2943348 03/20/15		

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Qty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
1	CA	Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarren, Jay L. Lieberman, Soyant Pfeuser, Jonathan E. Romano, Anna E. Yee, Daniel Sotgiu, Leah Brown, Robert C. Weissman, Joseph C. Prince, Robert C.	2892821 12/06/13	2892821 06/13/14	
1	CA	Regulatory Elements from Labyrinthulomycetes Microorganisms	Calazza, Nicky C. Win, Maung N. Urano, Jun	2977271 02/29/16		
1	CA	Compositions and Methods for High Efficiency In Vivo Genome Editing	Varruto, John H. Moellering, Eric R.	2872454 12/31/15		
1	CA	Microorganisms for Fatty Acid Production Using Elongase and Desaturase Enzymes	Calazza, Nicky Felnagle, Elizabeth Urano, Jun Win, Maung Nyar Radakowits, Randor R.	2978270 03/11/16		
1	CA	Tamper-Resistant Assembly for Securing Valuable Material	Warden, Laurence Newman-Lehman, Ter Gibson, Daniel G.	2945810 05/01/15		
1	CA	Lid Mechanism	Warden, Laurence Beaver, Scott Wayne Recker, Mark Henry	2855188 07/15/15		
1	CA	Protein Rich Food Ingredient from Biomass and Methods of Manufacture	Rott, George Clifford Hatt, James H. Domadia, Peter Toledo, Gerardo V.	2992860 01/25/16		
1	CA	Algal Chloroplastic GRP54 Mutants	Dipietro, Christen McCarren, Jay Sotgiu, Leah	2942848 04/15/16		
1	CA	Protein Containing Material from Biomass and Methods of Production	Schoffen, Johannes Lakshmanaswamy, A. Burke, Joel Rott, George C.	3011826 01/26/17		
1	CA	Production of Proteins in Labyrinthulomycetes	Calazza, Nicky C. Urano, Jun Win, Maung N. Eales, Kent S.	03/15/17		
1	CA	SGVI Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	2607532 05/04/06	2607532 11/09/06	2607532 03/12/13
1	CA	SGVI In Vitro Recombination Method	Young, Lei Smith, Hamilton O. Gibson, Daniel G.	2618699 08/11/06	2618699 02/23/07	2618699 10/03/12
1	CA	SGVI Method for In Vitro Recombination	Smith, Hamilton O. Gibson, Daniel G.	2618665 06/11/06	2618665 03/22/07	2618665 11/23/12
1	CA	SGVI Synthesis of Error-Minimized Nucleic Acid Molecules	Young, Lei	2642514 12/04/06	2642514 06/07/07	2642514 06/07/11
1	CA	SGVI Installation of Genomes or Partial Genomes into Cells or Cell-Like Systems	Glass, John I. Young, Lei Lartigue, Carole Assad-Garcia, Nancy Hutchison, Clyde A. Smith, Hamilton O. Mentzer, J. Craig	2643136 12/22/06	2643136 02/07/08	2643136 04/18/17
1	CA	SGVI Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.	2643356 12/06/06	2643356 02/28/08	

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Qty	Year	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
CA	SGV1	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Gwynedd A. Young, Lei Glass, John J. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	2701923 10/07/08		
CA	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	2715586 02/13/09		2715586 08/28/2018
CA	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John J. Hutchison, Clyde A. Lartigue, Carole Vashee, Santay Aigrie, Mikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	2754212 03/05/10		2754212 08/02/16
CA	SGV1	Encoding Text into Nucleic Acid Sequences	Hutchison, Clyde A. Montague, Michael G. Smith, Hamilton O.	2779495 10/29/10		
CA		Crowding Agent-Induced Nucleic Acid Transfer into a Recipient Host Cell	Karas, Bogumil J. Hutchison, Clyde A. Smith, Hamilton O. Suzuki, Yo	2882661 08/30/13	2882661 03/05/14	
CA		Picrocol Fuel Cell	Bratschiger, Drianna Wanger, Greg	2872787 05/10/13		
CA	SG1	Method for Producing Polymers	Stähler, Peer F. Stähler, Cord F. Müller, Manfred	2362389 02/18/00		2362389 07/27/10
CA	SG1	Recombinant Arterivirus Replicon Systems and Uses Thereof	Kanrud, Kurt Wang, Nathaniel S. Felderman, Marina Carrico, Harry	3020426 10/05/18		
CN		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Dodge, Corey	200880126568 12/11/08	101952452 01/19/11	101952452 07/09/18
CN	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Environments	Toledo, Gerardo V. Richardson, Toby Stagl, Ulrich Mehner, Eric J. Venter, J. Craig	200980118909 05/12/09	102027195 04/25/11	102027195 05/14/14
CN		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	200980149831 12/18/09	102245780 11/16/11	ZL 200980149831.2 09/25/15
CN	MSTQ	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovas, Janne S. McCann, Ryan T.	201180050598X 10/25/11	103180453 06/26/13	
CN	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandic, Christopher J. Kerovas, Janne S. Richardson, Toby H. Schwarz, Ariel S.	2012800485980 09/17/12	103948393 07/23/14	
CN		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Cavazz, Nicky Richardson, Toby H.	2013800920317 02/01/13	104321682 12/17/14	

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Cty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
CN		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhiqing Urano, Jun Caiazza, Nicky C. Gibson, Daniel G.	2013900613606 12/11/13	104822840 08/05/15	
CN		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gill, John E.	2013800536066 06/16/13	104755618A 07/01/15	
CN		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gill, John E.	201330115909X 06/16/13	CN 103285896 07/17/2018	
CN		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	2013800566380 09/20/13	104769122 A 07/08/15	
CN		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	201580021486X 03/20/15	106414253A 02/15/17	
CN		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarson, Jay L. Lieberman, Soyas Meuser, Jonathan E. Romano, Anna E. Yee, Daniel Sorlage, Leah Brown, Robert C. Weissman, Joseph C. Finze, Robert C. Moore, Robert C.	2013601636398 12/06/13	104837995 08/12/15	
CN		Compositions and Methods for Modulating Biomass Productivity	Ajawi, Imad Aqui, Moena Sorlage, Leah	2014900507972 10/03/14	CN 105745324 A 07/05/16	
CN		Methods for Producing Dicarboxylic Acids	Griffin, Benjamin M. Kambourakis, Spiros	201480059791.3 11/20/14	CN105693366A 06/15/16	
CN		Biomass Productivity Regulator	Ajawi, Imad Aqui, Moena Chavez-Torres, Carlos	2014600681580 12/30/14	CN105814180A 07/27/16	
CN		Microorganisms Engineered for Increased Productivity	Badman, Nick Ajawi, Imad	201680051363.5 09/02/16	CN 108135198A 06/08/18	
CN		Tamper-Resistant Assembly for Securing Valuable Material	Warden, Laurence Newman-Lehman, Tei Gibson, Daniel G.	2015800214889 05/01/15	CN 107027330 A 08/08/17	
CN		Lid Mechanism	Warden, Laurence Beaver, Scott Wayne Berker, Mark Henry	2015800352013 07/15/15	CN 106536371 A 03/22/17	
CN		Protein Rich Food Ingredient from Biomass and Methods of Manufacture	Rutt, George Clifford Flatt, James H. Domaille, Peter Toledo, Ricardo V.	201580045361.0 07/24/15	CN106572681A 04/19/17	
CN		Algal Mutants with Increased Lipid Productivity	Ajawi, Imad Sorlage, Leah Aqui, Moena Moellering, Eric R.	2016800705122 11/02/16	CN 108368491 A 03/03/18	
CN		Microorganisms having Increased Lipid Productivity	Ajawi, Imad Moellering, Eric R. Sorlage, Leah Aqui, Moena	201680052590X 07/19/16	CN 108025504 A 11. May 2018	
CN		Protein Containing Material from Biomass and Methods of Production	Scholten, Johannes Lakshmanaswamy, A Burke, Joel Rutt, George C.	2017800138548 01/28/17		
CN	SGV1	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	200680024024 05/01/05	11213311 07/03/08	200680024024.4 02/11/17
CN	SGV1	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.	2006800524443 12/06/06	101501207 05/05/09	PL3006800524443 03/12/18

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Qty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
CN	5GV1	Methods of Genome Installation in a Recipient Host Cell	Larigue, Carole Glass, John I. Aizerovich, Nina Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig Merryman, Charles Vashee, Sanjay	200800230575 05/01/08	101730741 06/09/10	212008800230575 12/11/13
CN	5GV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	201710235645.1 02/13/09	107384910A 11/24/17	
CN	5GV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Larigue, Carole Vashee, Sanjay Agire, Mikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	201000020174 03/05/10	102421897 04/18/12	201080020174-9 12/16/15
CN	5GV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Larigue, Carole Vashee, Sanjay Agire, Mikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	2013100112892 03/05/10	105274004A 01/27/16	
CN		Microbial Fuel Cell	Bretschger, Drianna Wang, Greg	2013800244103 05/10/13	104303354 01/31/15	
EA	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandic, Christopher J. Kerovuo, Janne S. Richardson, Toby R. Schwartz, Ariel S.	201490480 08/17/12	201490480 06/30/14	025308 11/30/16
EP		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Venter, J. Craig Mathar, Eric J. Toledo, Gerardo V. Chang, Hwai, W. Creek, Wayne A.	2008744213 01/21/08	2132301 12/18/09	2132301 05/23/13
EP		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Dodge, Corey	2008060168 12/11/08	2231864 09/29/10	2231864 09/29/17
EP	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Environments	Toledo, Gerardo V. Richardson, Toby Stingl, Ulrich Mathar, Eric J. Venter, J. Craig	09747397 05/12/09	2394281 03/15/11	2294281 09/03/14
EP	AGRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strobel, Gary A.	10712295.4 04/02/10	2413682 02/08/12	
EP		Microbial Production of Fatty Alcohols	Roesler, Paul G. Watts, Kevin Liu, Bo	10808723 05/11/10	2464722 05/20/12	2464722 10/04/17
EP		Production of Branched-Chain Alcohols by Photosynthetic Bismicroorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	2009832879 12/10/09	2367949 09/28/11	3367949 09/27/17

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Clty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
EP		Acyl-ACP Thioesterase Genes and Uses Therefor	Roesler, Paul G. Lee-Roy, Gina	10800309.6 06/29/10	2448955 05/09/12	2448955 09/30/15
EP		Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Environments	Clement, Brian G. Ferry, James G. Underwood, Stuart	11780498 06/03/11	2576763 09/16/13	
EP	MSTC	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovuo, Janne S. McCaig, Ryan T.	11839546.7 10/25/11	2633064 09/04/13	2633064 08/01/16
EP	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Therefor	Grandic, Christopher J. Kerovuo, Janne S. Richardson, Toby M. Schwartz, Ariel S.	12825942.1 08/17/12	2744920 6/25/14	
EP		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby M.	13743710.9 02/01/13	2809795 12/15/14	
EP		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhiqing Urano, Jun Calazza, Nicky C. Gibson, Daniel G.	13863073.6 12/11/13	2931913 10/21/15	
EP		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gill, John E.	13829148.6 08/16/13	2885408 06/24/15 Re-Publ 04/20/16	
EP		Production and Secretion of Fatty Acids and Fatty Acid Derivatives	Holzapple, Erik Brown, Robert C. Seshadri, Rehana Coppersmith, Jennifer Verruto, John	13835668 09/27/12	2761912 08/05/14	2761012 08/09/17
EP		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	13838353 09/20/13	2990083 07/29/15	
EP		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCaig, Jay L. Lieberman, Royan Reuser, Jonathan E. Romano, Anna E. Yee, Daniel Sonuga, Leah Brown, Robert C. Weissman, Joseph C. Prince, Robert C. Nielsen, Robert D.	13860017.6 12/06/13	2929025 10/14/15	2929025 07/25/16
EP		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCaig, Jay L. Lieberman, Royan Reuser, Jonathan E. Romano, Anna E. Yee, Daniel Sonuga, Leah Brown, Robert C. Weissman, Joseph C. Prince, Robert C. Nielsen, Robert D.	18178313.5 12/06/13		
EP		Compositions and Methods for Modulating Biomass Productivity	Ajawi, Imad Aguil, Moena Sonuga, Leah	14851126.4 10/03/14	3052634 08/10/16	
EP		Methods for Producing Dicarboxylic Acids	Griffin, Benjamin M. Kambourakis, Spiros	14863253.4 11/20/14	3071699 08/28/16	

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Clty	Class	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
EP		Biomass Productivity Regulator	Ajawi, Imad Aqui, Moena Chavez-Torres, Carlos	14876326.1 12/30/14	3090941 11/09/16	
EP		Microorganisms Engineered for Increased Productivity	Bauman, Nick Ajawi, Imad	16883151.8 09/02/16	3344776 07/11/18	
EP		Regulatory Elements from Labyrinthomyces Microorganisms	Caiazza, Nicky C. Win, Maung N. Urano, Jun	16759329.2 03/29/16	3265567 01/10/18	
EP		Compositions and Methods for High Efficiency In Vivo Genome Editing	Verschu, John H. Moellering, Eric R.	15076386.2 12/31/15	3240889 11/08/17	
EP		Microorganisms for Fatty Acid Production Using Elongase and Desaturase Enzymes	Caiazza, Nicky Fellnagie, Elizabeth Urano, Jun Win, Maung Nyah Radakowits, Randor R.	16762648.8 03/11/16	3268457 01/17/18	
EP		Tamper-Resistant Assembly for Securing Valuable Material	Warden, Laurence Newman-Lehman, Tel Gibson, Daniel G.	15786364.8 05/01/15	3138088 03/08/17	
EP		Lid Mechanism	Warden, Laurence Beaver, Scott Wayne Backer, Mark Henry	15821717.4 07/15/15	3169601 05/24/17	
EP		Protein Rich Food Ingredient from Biomass and Methods of Manufacture	Rutt, George Clifford Flett, James H. Domaske, Peter Toledo, Geovany V.	15825225.4 07/24/15	3171705 05/31/17	
EP		Algal Mutants with Increased Lipid Productivity	Ajawi, Imad Sohlage, Leah Aqui, Moena Moellering, Eric R.	16863863.2 11/02/16	3371303 09/12/18	
EP		Microorganisms having Increased Lipid Productivity	Ajawi, Imad Moellering, Eric R. Sohlage, Leah Aqui, Moena	16826316.1 07/14/16	3323799 05/23/18	
EP		Algal Chloroplastic SRPS4 Mutants	Dipetrillo, Kristen McCarren, Jay Sohlage, Leah	16780942.5 04/15/16	3283980 03/21/18	
EP		Protein Containing Material from Biomass and Methods of Production	Schullen, Johannes Lakshmanaswamy, Arun Buika, Joel Rutt, George C.	17744909.7 01/26/17		
EP		Production of Proteins in Labyrinthomyces	Caiazza, Nicky C. Urano, Jun Win, Maung N. Boles, Kent S.	17767446.2 03/15/17		
EP	SGVI	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	2006751837 05/03/06	1805880 03/13/08	1805880 07/21/10
EP	SGVI	In Vitro Recombination Method	Young, Lei Smith, Hamilton O. Gibson, Daniel G.	2006813368 06/11/06	1915446 04/30/08	1915446 06/14/17
EP	SGVI	Method for In Vitro Recombination	Smith, Hamilton O. Gibson, Daniel G.	2006836102 08/11/06	1829012 06/11/08	1829012 10/06/10
EP		Method for In Vitro Recombination	Smith, Hamilton O. Gibson, Daniel G.	18168787 08/11/06	2239327 10/13/10	2239327 07/25/15
EP	SGVI	Minimal Bacterial Genome	Glass, John J. Smith, Hamilton O. Hutchison, Clyde A. Alperovich, Nina Y. Asadi-Garru, Nazem	2006825527 10/12/06	1951674 08/06/08	
EP	SGVI	Synthesis of Error-Minimized Nucleic Acid Molecules	Young, Lei	2006844856 12/04/06	1903535 09/03/08	1903535 11/30/13

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Clty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
EP	SGV1	Installation of Genomes or Partial Genomes into Cells or Cell-line Systems	Glass, John I. Young, Lei Lartigue, Carole Assad-Garcia, Nancy Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig	2008051502 12/22/08	1963515 09/03/08	1963515 08/28/14
EP	SGV1	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.	2008051474 12/06/08	1968994 09/17/08	1968994 07/03/13
EP		Recombinant Hydrogen-Producing Cyanobacterium and Uses Thereof	Xu, Qiang Smith, Hamilton O.	07474083 10/16/07	2076566 07/08/09	2076566 09/24/14
EP	SGV1	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Gwynedd A. Young, Lei Glass, John I. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	2508638436 10/07/08	2207899 07/21/10	2207899 04/18/18
EP	SGV1	Methods of Genome Installation in a Recipient Host Cell	Lartigue, Carole Glass, John I. Aperovich, Nina Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig Maryman, Charles Yashee, Sanjay	2008754980 05/01/08	2147099 01/27/10	2147099 08/08/18
EP	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	09711127 02/13/09	2295013 12/01/10	2295013 06/08/16
EP	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	15165628.7 02/13/09	3064509 09/07/16	
EP	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Yashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Maryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	15708954 03/05/10	3403944 01/11/12	3403944 06/28/17
EP	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Yashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Maryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	17177614.9 01/05/10	3249045 11/29/17	
EP	SGV1	Encoding Text into Nucleic Acid Sequences	Hutchison, Clyde A. Montague, Michael G. Smith, Hamilton O.	10827576 10/29/10	2494060 06/05/12	2494060 04/27/16

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Clty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
EP		Encoding Agent-Induced Nucleic Acid Transfer into a Recipient Host Cell	Karas, Sogami J. Hutchison, Clyde A. Smith, Hamilton O. Susaki, Yo	130833688 08/30/13	2890787 07/08/15	
EP		Microbial Fuel Cell	Breischlager, Orsma Wanser, Greg	13798247.8 05/10/13	2947818 03/18/15	
EP	SGI	Method for Producing Polymers	Stahler, Peer F. Stahler, Cord F. Müller, Manfred	100809311 02/18/00	1353127 11/14/01	1153127 07/26/06
EP	SGI	Method for Producing Polymers	Stahler, Peer F. Stahler, Cord F. Müller, Manfred	98014767 02/18/00	1728860 12/05/05	1728860 01/27/10
EP	SGI	Method for Producing Polymers	Stahler, Peer F. Stahler, Cord F. Müller, Manfred	10151888 02/18/00	2175021 11/30/11	2175021 06/19/13
EP	SGI	Highly Parallel DNA Synthesizer Based on Matrices	Stahler, Peer F. Stahler, Cord F. Beier, Markus	09803181 11/18/09	1685261 08/02/06	1685261 03/25/15
EP	SGI	Synthesis of Sequence-Verified Nucleic Acids	Stahler, Peer F. Carapito, Raphael Stahler, Cord F. Matzas, Mark Leonard, Jack T. Jaeger, Joachim Beier, Markus	10706856 02/19/10	2398915 12/21/11	2398915 08/29/16
EP	SGI	Programmable Oligonucleotide Synthesis	Stahler, Peer F. Carapito, Raphael	07801345 08/23/07	2057176 05/13/09	2057176 10/16/13
EP	SGI	Programmable Oligonucleotide Synthesis	Stahler, Peer F. Carapito, Raphael	12163204 08/23/07	2402671 08/22/12	2402671 03/25/15
EP	SGI	Recombinant Arterivirus Replicon Systems and Uses Thereof	Kamrud, Kurt Wang, Nathaniel S. Feldman, Martina Carron, Nancy	17718781.2 10/11/18	3443107 02/20/18	
HK	SGVI	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	08107959 05/01/06	1112490 02/05/08	1112490 04/21/11
ID	AGRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strober, Gary A.	WI-00201104036 04/02/10		IDP00048431 04/18/17
ID		Methods for Producing Dicarboxylic Acids	Griffin, Benjamin M. Kambourakis, Spiros	P-00201603618 11/20/14	2017/09436 02/01/17	
IL		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Venter, J. Craig Mahar, Eric J. Toledo, Gerardo V. Chang, Hwai, W. Green, Wayne A.	201067 03/21/08	201067 03/24/13	201067 06/25/13
IL		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Krisof, Jessica R.	211808 12/10/09		211808 03/01/18
IL		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazzo, Nicky Richardson, Toby H.	233687 02/01/13		
IL		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhijiang Urano, Jun Calazzo, Nicky C. Gibson, Daniel G.	238918 12/11/13		
IL		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gil, John E.	236966 08/16/13		

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Qty	Class	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
11		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarren, Jay L. Lieberman, Soyars Peuser, Jonathan E. Romano, Anna E. Yee, Daniel Spragg, Leah Brown, Robert C. Weissman, Joseph C. Rince, Robert C.	238721 12/06/13		
11		Compositions and Methods for High Efficiency In Vivo Genome Editing	Venkata, John H. Moellering, Eric R.	152970 12/31/15		
11	SGV1	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton D.	187002 05/01/06	187002 03/23/12	187002 06/30/12
11	SGV1	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton D. Gibson, Daniel G.	192041 12/06/05	192041 12/29/08	192041 11/30/13
11	SGV1	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Gwynedd A. Young, Lei Glass, John I. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton D.	204892 10/07/08		204892 05/29/18
11	SGV1	Methods of Genome Installation in a Recipient Host Cell	Larigue, Carole Glass, John I. Aiperovich, Nina Hutchison, Clyde A. Smith, Hamilton D. Venter, J. Craig Merrynan, Charles Vashee, Sarjav	201835 05/01/08	201835 07/31/13	201835 11/01/13
11	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton D. Hutchison, Clyde A. Young, Lei Venter, J. Craig	207572 02/13/09	207572 04/30/17	207572 07/31/17
11	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton D. Hutchison, Clyde A. Young, Lei Venter, J. Craig	251161 02/13/09		
11	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Larigue, Carole Vashee, Sarjav Agre, Nikkel A. Smith, Hamilton D. Merrynan, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	214828 03/05/10	214828 01/31/16	214828 05/01/16

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Cl.	Class	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
IL	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glas, John L. Hutchison, Clyde A. Lartigue, Carole Vashee, Santjay Agire, Nikkel A. Smith, Hamilton O. Merriman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	242303 03/05/10	242303 06/29/17	242303 09/30/17
IL		Microbial Fuel Cell	Bretschger, Orjana Wander, Greg	235125 05/10/13		
IN		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Orlitz, Corey	4004/CHENP/2010 12/11/08		
IN	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Toledo, Gerardo V. Richardson, Toby Sung, Ulrich Mathur, Eric J. Venter, J. Craig	7258/CHENP/2010 05/13/09		296011 06/25/18
IN	MSTC	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovus, Janne S. McCann, Ryan T.	4032/CHENP/2013 10/25/11	4032/CHENP/2013 07/18/14	
IN	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandic, Christopher J. Kerovus, Janne S. Richardson, Toby H. Schwartz, Ariel S.	3046/CHENP/2014 08/17/12	2046/CHENP/2014 07/01/16	
IN		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby H.	5816/CHENP/2014 02/01/13	5816/CHENP/2014 07/01/16	
IN		PEG-Mediated Assembly of Nucleic Acid Molecules	Ci, Zhiqing Urano, Jun Calazza, Nicky C. Gibson, Daniel G.	3633/CHENP/2015 12/11/13	3633/CHENP/2015 07/01/16	
IN		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gil, John E.	1350/CHENP/2015 08/16/13		
IN		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	1974/CHENP/2015 09/20/13	1974/CHENP/2015 07/01/16	
IN		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	201647034619 03/20/15	201647034619 11/25/16	
IN		Protein Containing Material from Biomass and Methods of Production	Scholtes, Johannes Lakshmanaswamy, A. Burke, Joel Rutt, George C.	01/26/17		
IN	SGV1	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	8526/DENP/2007 05/01/06		262638 09/01/14
IN	SGV1	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.	2703/NDLNP/2008 12/06/08		292756 02/09/18

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Clty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
IN	5GV1	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Gwynedd A. Young, Lei Glass, John J. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	2477/DELNP/2010 10/07/08	2477/DELNP/2010 10/01/10	283647 08/26/17
IN	5GV1	Methods of Genome Distillation in a Recipient Host Cell	Lartigue, Carole Glass, John J. Aperovich, Nina Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig Merryman, Charles Vashee, Sanjay	4101/KOLNP/2009 05/04/08		300249 08/24/2018
IN	5GV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	5196/CHEMP/2010 02/13/09	5196/CHEMP/2010 12/03/10	289454 11/10/17
IN	5GV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	201748037979 02/13/09		
IN	5GV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John J. Hutchison, Clyde A. Lartigue, Carole Vashee, Sanjay Agire, Mikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	7211/CHEMP/2011 03/05/10		
JP		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Venter, J. Craig Mathru, Eric J. Tolado, Gerardo V. Chang, Hwai, W. Gusev, Wladimir A.	2009-554782 03/21/08	2010-822334 07/01/10	5936805 08/20/16
JP		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Doolae, Corey	2010638189 12/11/08	2011505808 03/03/11	5465183 01/31/14
JP	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandic, Christopher J. Kerovus, Janne S. Richardson, Toby H. Schwartz, Ariel S.	2014-536260 08/17/12	2014-536260 10/09/14	6230125 10/27/17
JP		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby H.	2017-245518 02/01/13	2018-068311 05/10/18	
JP		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhong Urano, Jun Calazza, Nicky C. Gibson, Daniel G.	2015-175502 12/11/13		
JP		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gil, John E.	2015-537874 08/16/13	2015-532643 11/12/15	
JP		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	2015-533225 09/20/13	2015-536841 12/24/15	6163557 06/23/17

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Qty	Use	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
JP		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	2017-091072 9/20/13	2017-195885 11/2/17	
JP		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	2016-055638 09/20/13		
JP		Compositions and Methods for High Efficiency In Vivo Genome Editing	Verrito, John H. Moslener, Eric R.	2017-534947 12/31/15	2018-500037 01/11/18	
JP		Protein Rich Food Ingredient from Biomass and Methods of Manufacture	Rutt, George Clifford Flatt, James H. Domigale, Peter Tolado, Gerardo V.	2017-504026 07/24/15	2017-522863 08/17/17	
JP		Protein Containing Material from Biomass and Methods of Production	Scholten, Johannes Lekshmanaswamy, Arun Buika, Joel Rutt, George C.	2018-539156 01/26/17		
JP	SGVI	Synthesis of Error-Minimized Nucleic Acid Molecules	Young, Lei	2008543550 12/04/06	2009/518013 05/07/09	4789271 07/29/11
JP	SGVI	Installation of Genomes or Partial Genomes into Cells or Cell-like Systems	Glass, John I. Young, Lei Lartigue, Carole Assad-Garcia, Nancya Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig	2008547655 12/22/06	2009/521229 06/04/09	
JP	SGVI	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.	2008544524 12/06/06	2009/518038 05/07/09	5106412 10/12/13
JP	SGVI	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Gwynedd A. Young, Lei Glass, John I. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	2010628976 10/07/08	2010539894 12/24/10	5618413 09/26/14
JP	SGVI	Methods of Genome Installation in a Recipient Host Cell	Lartigue, Carole Glass, John I. Aperovich, Nina Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig Merriman, Charles Lynch, Steven	2010606659 05/01/08	2011519263 07/07/11	5637846 10/31/14
JP	SGVI	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	2010-546942 02/13/08	2011512140 09/21/11	5725540 09/10/15
JP	SGVI	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	2015-067054 02/13/09	2015-109852 06/18/15	5165789 06/30/17

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Qty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
1P	5GV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Vashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venner, J. Craig Gibson, Daniel G.	2013553154 03/05/10	2012519493 08/30/12	5713925 03/20/15
1P	5GV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Vashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venner, J. Craig Gibson, Daniel G.	2015-047152 03/05/10	2015-128444 7/16/15	
1P	5GV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Vashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Noskov, Vladimir N. Chuang, Ray-Yuan Venner, J. Craig Gibson, Daniel G.	2017-105163 03/05/10	2017-190055 08/17/17	
1P	5G1	Recombinant Arterivirus Replicon Systems and Uses Thereof	Kanrud, Kurt Wang, Nathaniel S. Felderman, Marilou Larico, Nancy	2018-553420 10/11/18		
1MX		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Venner, J. Craig Mabur, Eric J. Toledo, Gerardo V. Chang, Hwai, W. Green, Wayne A.	MX/a/2009/010108 03/21/08		302360 06/10/12
1MX	AGRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strobel, Gary A.	MX/a/2011/010420 04/02/10	MX/a/2011/010420 12/16/11	
1MK		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	MX/a/2011/006301 12/10/09	MX/a/2011/006301 10/24/11	307272 03/08/13
1MX	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Therefor	Grasdic, Christophe J. Keravus, Janne S. Richardson, Toby H. Schwartz, Ariel S.	MX/a/2014/002027 08/17/12	MX/a/2014/002027 11/10/14	

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Qty	Year	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
MX		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarren, Jay L. Lieberman, Soyán Meuser, Jonathan E. Romano, Anna E. Yee, Daniel Sorjaga, Leah Brown, Robert C. Weissman, Joseph C. Prince, Robert C.	MX/a/2015/007262 12/06/13	MX/a/2015/007262 07/18/16	
MX		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarren, Jay L. Lieberman, Soyán Meuser, Jonathan E. Romano, Anna E. Yee, Daniel Sorjaga, Leah Brown, Robert C. Weissman, Joseph C. Prince, Robert C.	MX/a/2018/016636 12/06/13	MX/a/2015/007262 07/18/16	
MX		Protein Rich Food Ingredient from Biomass and Methods of Manufacture	Rutt, George Clifford Flatt, James H. Donnale, Peter Toledo, Gerardo V.	MX/a/2017/001180 07/24/15		
MX		Protein Rich Food Ingredient from Biomass and Methods of Manufacture	Rutt, George Clifford Flatt, James H. Donnale, Peter Toledo, Gerardo V.	MX/a/2018/000981 01/25/16		
MY		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Yenter, J. Craig Mathur, Eric, J. Toledo, Gerardo V. Chang, Hwai, W. Green, Wayne A.	PE20093917 01/21/08		MY-150704-A 02/28/14
MY		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Dodge, Corey	PE2010/002988 12/11/08		MY-154028 04/30/15
MY	AGRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strobel, Gary A.	P1-2011004741 04/02/10		MY-158356-A 09/30/16
MY		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	PE2015700886 09/20/13		
MY		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	P1-2016703389 03/20/15		
MY		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarren, Jay L. Lieberman, Soyán Meuser, Jonathan E. Romano, Anna E. Yee, Daniel Sorjaga, Leah Brown, Robert C. Weissman, Joseph C. Prince, Robert C.	PE2015701297 12/06/13		
MY		Methods for Producing Dicarboxylic Acids	Griffin, Benjamin M. Kambourakis, Spiros	P1-2016701511 11/20/14		
MY	SGV1	In Vitro Recombination Method	Young, Lei Smith, Hamilton O. Gibson, Daniel G.	PE20063912 09/11/06		MY-143586 06/15/11
MY	SGV3	Method for In Vitro Recombination	Smith, Hamilton O. Gibson, Daniel G.	PE20063911 08/11/06		MY-148014-A 07/29/11

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Cty	Use	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
MY	SGV	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Gwynedd A. Young, Lei Glass, John J. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	PI 2010001512 10/07/08		MY-181418-A 04/14/17
PCT		Methods for Assembling DNA Molecules	Gil, John E. Gibson, Daniel G. Fu, Lijia	PCT/US17/65877 12/12/17	2018/111913 06/21/18	
PCT		Genetically Engineered Vibrio Sp. and Uses Thereof	Weinstock, Matthew T. Wilson, Christopher M.	PCT/US17/48741 08/25/17	2018/09639 03/01/18	
PCT		Expression of Modified Glycoproteins and Glycosphingolipids	Calazza, Nicky C.	PCT/US17/92304 10/31/17	2018/085273 05/11/18	
PCT		Expression of Modified Glycoproteins and Glycosphingolipids	Calazza, Nicky C.	PCT/US18/30235 04/30/18		
PCT		High Productivity Algal Mutants Having Reduced Photosynthetic Antenna	Moellering, Eric R. Bairman, Nicholas Radakowits, Randor R. Spreafico, Roberto Kuzminov, Fedor Algawi, Imad Inam, Saheed Schultz, Andrew Kwok, Kathleen Aqui, Moena Nominas, Jennifer Verruto, John M. Bailey, Shaun	PCT/US17/69073 12/29/17	2018/125201 07/05/18	
PCT		Polypeptides with Type V CRISPR Activity and Uses Thereof	Monds, Russell D. Mantovani, Simone M. Kemp, Russell S. LaFave, Matthew C. Kannan, Krishna LaMattina, Joseph W. Lucas, Joseph S. Moellering, Eric R.	PCT/US18/27650 04/13/18		
PCT		Vibrio Sp. Organisms with Modified Lipopolysaccharide	Weinstock, Matthew T. Gibson, Daniel G. Shanlin, Daniel	PCT/US2018/54883 10/08/18		
PCT		Compositions, Systems, Kits, and Methods for Modifying RNA	Mantovani, Simone M. Monds, Russell D. LaFave, Matthew C. Brown, Robert C.	PCT/US2018/60831 11/13/18		
PCT		Photobioreactor for Contained Microorganism Cultivation	Calazza, Miguel Davenport, Jason Coarf, Julie Perez, Xavier Brown, Lotis R. Brown, Robert C.	PCT/US18/63920 12/04/18		
PCT	SGI	Recombinant Arterivirus Replicon Systems and Uses Thereof	Kamrud, Kurt Wang, Nathaniel S. Felderman, Martina Carrico, Nancy	PCT/US17/27249 04/12/17	2017/150770 10/19/17	
PCT	SGI	Recombinant Virus Replicon Systems and Uses Thereof	Kamrud, Kurt I.	PCT/US17/59928 10/03/17	2018/095235 04/26/18	
PCT	SGI	Compositions and Methods for Enhancing Gene Expression	Kamrud, Kurt I. Wu, Ming N. Wang, Nathaniel S. Gehring, Jacob L.	PCT/US17/69561 12/04/17	2018/108615 06/14/18	

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Clty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
PCT	SGI	Induce and Enhance Immune Responses using Recombinant Replikon Systems	Kamrad, Kurt T. Wang, Nathaniel S. Alahrad, Parthaz DeHart, Jason L.	PC7/US2019/14210 01/18/19		
PL	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Toledo, Gerardo V. Richardson, Toby Stengl, Ulrich Mathur, Eric S. Venner, J. Craig	P.393466 05/12/09		320307 11/24/14
RU	BP	Methods to Stimulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Toledo, Gerardo V. Richardson, Toby Stengl, Ulrich Mathur, Eric S. Venner, J. Craig	2010150769 05/12/09	2010150769 06/20/12	2488636 07/27/13
RU	MSTG	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovus, Jarne S. McCann, Ryan T.	2013123987 10/25/11	2013123987 12/10/14	2610873 05/11/17
SG		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby H.	10201506285Y 02/01/13		
SG		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhiqiang Urano, Jun Calazza, Nicky C. Gibson, Daniel G.	11201704436Y 12/11/13		
SG		Digital to Biological Converter	Venner, J. Craig Gibson, Daniel G. Gill, John E.	10201701022Y 08/16/13		10201701022Y 09/26/2018
SG		Digital to Biological Converter	Venner, J. Craig Gibson, Daniel G. Gill, John E.	10201701022Y 08/16/13		10201701022Y 09/26/2018
SG		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	11201502143Y 09/20/13	11201502143Y 04/23/15	11201582143Y 01/12/18
SG		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	10201702263Q 09/20/13	10201702263Q 05/30/17	10201702263Q 11/16/17
SG		Methods for Producing Dicarboxylic Acids	Griffin, Benjamin M. Kambourakis, Spiros	11201603078Y 11/20/13	11201603078Y 05/30/16	
SG		Compositions and Methods for High Efficiency In Vivo Genome Editing	Venuto, John H. Moellering, Eric R.	11201704272Y 12/31/15	11201704272Y 06/29/17	
SG	SGV1	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Ghysnedd A. Young, Lei Glass, John I. Venner, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	2012089785 10/07/08	186828 01/30/13	186628 06/07/16
SG	SGV1	Methods of Genome Installation in a Recipient Host Cell	Lartigue, Carole Stess, John I. Aperovich, Nina Hutchison, Clyde A. Smith, Hamilton O. Venner, J. Craig Merrymen, Charles Vachon, Sebastien	200907187 05/01/08	186476 12/29/08	186476 05/15/12
SG	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venner, J. Craig	201300777-6 02/13/09	186101 03/29/13	186101 03/12/15

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Clty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
SG	SGV3	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	10201800778Q 02/13/09		
SG	SGV3	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Yashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Neskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	201106396 03/05/10	174197 10/28/11	
SG	SGV3	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Yashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Neskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	10201400436P 03/05/10	10201400436P 06/27/14	10201400436P 06/15/17
SG	SGV3	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Yashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Neskov, Vladimir N. Chuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	10201704668R 03/05/10		
SG		Microbial Fuel Cell	Bretschger, Brianna Waters, Greg	10201609434K 05/10/13		
TH	AGRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strobel, Gary A.	1101002485 04/02/10		
TW	SGV3	Installation of Genomes or Partial Genomes into Cells or Cell-like Systems	Glass, John I. Young, Lei Lartigue, Carole Azad-Garcia, Nancy Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig	095148784 12/23/05		1492819 02/11/15
QA	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Therefor	Grandic, Christopher J. Keravuo, Janne S. Richardson, Toby H. Schwartz, Ariel S.	2014 02722 08/17/12		
US		Systems and Methods for Anaerobic Environmental Microbial Compartmentalized Cultivation	Venter, J. Craig Mathur, Eric, J. Toledo, Gerardo V. Cheng, Hwai, W. Green, Wayne A.	12/532483 09/21/09	371 2010/0330651 12/30/10	9556413 01/31/17

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Qty	Use	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
US		Dimethylortane as an Advanced Biofuel	Picataggio, Stephen Watts, Kevin Martin, Kevin Verruto, John Eneššlec, Jan	12/742906 05/13/10 371	2011/0160501 06/30/11	8309323 11/13/12
US		Methylbutanol as an Advanced Biofuel	Picataggio, Stephen Brown, Robert C. Kristof, Jessica R. Lee, Gena Prakash, Prachee Underwood, Stuart A. Watts, Kevin Martin, Kevin V.	12/333305 12/10/08	2009/0288327 11/26/09	8114641 02/14/12
US		Methylbutanol as an Advanced Biofuel	Picataggio, Stephen Brown, Robert C. Kristof, Jessica R. Roy, Gena Prakash, Prachee Underwood, Stuart A. Watts, Kevin Martin, Kevin V.	13/305414 11/28/11	2014/0122780 10/30/14	9080188 07/14/15
US		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Dodge, Corey	12/333280 12/11/08	2009/0298143 12/03/09	
US		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Dodge, Corey	13/340380 12/29/11	2013/0005001 01/03/13	
US		Identification of Centromere Sequences and Uses Thereof	Zieler, Helge Brown, Robert Richardson, Toby Smith, Douglas	12/431703 04/28/09	2010/0041035 03/18/10	8798810 09/12/17
US	BF	Methods of Identifying Stimulants for Biogenic Methane Production from Hydrocarbon-Bearing Environments	Toledo, Gerardo V. Richardson, Toby Singl, Ulrich Nathin, Eric J. Venier, T. Crain	12/464832 05/12/09	2010/0047733 02/25/10	7977086 07/12/11
US	BF	Methods of Identifying Stimulants for Biogenic Methane Production from Hydrocarbon-Bearing Environments	Toledo, Gerardo V. Richardson, Toby Singl, Ulrich Nathin, Eric J. Venier, T. Crain	13/177425 07/06/11	2011/0277991 11/17/11	8440703 05/28/13
US	ACRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strabel, Gary A.	12/753714 09/02/10	2010/0255124 10/07/10	8425946 04/23/13
US	ACRD	Compositions of Volatile Organic Compounds and Methods of Use Thereof	Green, Wayne A. Strabel, Gary A.	13/898645 04/02/10	2013/0224315 08/29/13	8968795 03/03/15
US		Microbial Production of Fatty Alcohols	Roesler, Paul Watts, Kevin Liu, Bo	12/854548 08/11/10	2011/0195468 08/11/11	8613002 01/21/14
US		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	12/635653 12/10/09	2010/0151545 06/17/10	8124470 02/28/12
US		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	13/338579 12/28/11	2012/0094302 04/19/12	8445257 05/21/12
US		Production of Branched-Chain Alcohols by Photosynthetic Microorganisms	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	13/698754 05/21/13	2013/0316415 11/28/13	8181538 11/10/15
US		Acyl-ACP Thioesterase Genes and Uses Thereof	Roesler, Paul G. Roy, Gena	12/626592 06/29/10	2011/0020883 01/27/11	8856834 02/17/15

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Qty	Class	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
US		Acyl-ACP Thioesterase Genes and Uses Therefor	Roesler, Paul G. Roy, Gina	14/608847 01/29/15	2015/0147790 05/28/15	8920340 03/20/16
US	BP	Mass Spectrometry Method	Martin, Kevin Hengard, Markus Reeves, Kathleen	13/250758 09/30/11	2013/0083041 04/05/12	8871575 10/28/14
US	BP	Microbial Community Normalization for Metagenomic Analyses	Ishoey, Thomas Clement, Brian G. Mathur, Eric J. Toledo, Gerardo V.	13/186319 07/19/11		
US	BP	Solubilization of Coal or Lignocellulose Biomass	Clement, Brian G. Richardson, Toby Underwood, Stuart A.	13/229594 09/09/11	2012/0064609 03/15/12	9528061 12/27/16
US	MSTG	Method for High-Throughput Identification of Microbial Antagonists against Pathogens	Kerovan, Janne S. McCann, Ryan T.	13/281297 10/25/11	2013/0107915 05/03/12	
US		Compositions and Methods for Modulating the Sensitivity of Cells to AHAS Inhibitors	Champagne, Michele Urano, Jun	13/671737 04/26/13	2013/0288377 10/31/13	9441238 09/13/16
US		Regulatory Elements and Uses Thereof	Champagne, Michele Richardson, Toby H. Urano, Jun	13/919522 06/11/13	2014/0363892 12/11/14	9846377 01/17/17
US		Molecules Associated with Fatty Acid Biosynthetic Pathways and Uses Thereof	Toledo, Gerardo V. Xu, Karen D. Urano, Jun	14/637356 03/03/15	2016/0222741 05/05/16	10,131,897 11/20/16
US		Molecules Associated with Fatty Acid Biosynthetic Pathways and Uses Thereof	Toledo, Gerardo V. Xu, Karen D. Urano, Jun	16/193884 11/16/2018		
US		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby H.	13/757633 02/01/13	2013/0225491 08/28/13	9771978 09/26/17
US		Materials and Methods for the Synthesis of Error-Minimized Nucleic Acid Molecules	Gibson, Daniel G. Calazza, Nicky Richardson, Toby H.	15/667515 08/02/17	2018/0051280 02/22/18	
US		PEG-Mediated Assembly of Nucleic Acid Molecules	Qi, Zhiqing Urano, Jun Calazza, Nicky C. Gibson, Daniel G.	16/212534 12/6/18		
US		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gill, John E.	13/969215 08/16/13	2014/0274808 9/18/14	8718060 08/01/17
US		Digital to Biological Converter	Venter, J. Craig Gibson, Daniel G. Gill, John E.	15/684366 07/12/17	2017/0320061 11/09/17	
US	BMRE	Production and Secretion of Fatty Acids and Fatty Acid Derivatives	Holzapple, Erik Brown, Robert C. Sestadi, Rekha Coppersmith, Jennifer Venuto, John	13/629492 09/27/12	2013/0078628 03/28/13	9017975 04/28/15
US		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	14/033300 09/20/13	2014/0106414 04/17/14	9306030 11/29/16
US		Compositions and Methods for Producing Chemicals and Derivatives Thereof	Kambourakis, Spiros Griffin, Benjamin Martin, Kevin V.	14/220453 03/31/14	2014/0206049 07/24/14	9578133 12/27/16

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Cty	Year	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
US		Algal Mutants Having a Lock-In High Light Acclimated Phenotype	Bailey, Shaun McCarren, Jay L. Lieberman, Soyant Meuser, Jonathan E. Romano, Anna E. Yee, Daniel Soraggi, Leah Brown, Robert C. Weissman, Joseph C. Rince, Robert C.	14/099879 12/06/13	2014/0220638 08/07/14	9882272 08/29/16
US		Compositions and Methods for Modulating Biomass Productivity	Ajawi, Imad Aqui, Moena Soraggi, Leah	14/506575 10/03/14	2015/0191515 07/09/15	9765146 09/19/17
US		Methods for Producing Dicarboxylic Acids	Griffin, Benjamin M. Kambouakis, Spiros	14/548580 11/20/14	2015/0176041 05/25/15	9909154 01/06/18
US		Nanochloropsis Spliced Leader Sequences and Uses Thereof	Seshadi, Reka Schwartz, Ariel S. Soraggi, Leah Brown, Robert C.	14/098278 12/05/13	2014/0186842 07/03/14	9914931 03/13/18
US		Nanochloropsis Spliced Leader Sequences and Uses Thereof	Seshadi, Reka Schwartz, Ariel S. Soraggi, Leah Brown, Robert C.	15/078243 01/23/18	2018/0155731 06/07/18	
US		Autonomous Replication Sequences and Episomal DNA Molecules	Derkoff, Peter Soraggi, Leah Akella, Shwilya	14/099682 12/06/13	2015/0094209 04/02/15	9447422 09/20/16
US		Biomass Productivity Regulator	Ajawi, Imad Aqui, Moena Chavez-Torres, Carlos	14/506512 12/30/14	2015/0183838 07/02/15	9441620 09/13/16
US		Microorganisms Engineered for Increased Productivity	Bauman, Nick Ajawi, Imad	15/256480 09/03/16	2017/0067069 03/09/17	
US		Recombinant RNA Particles and Methods of Use	Brown, Robert C. Kamrud, Kurt L.	14/822671 02/12/15	2015/0340236 08/27/15	
US		Regulatory Elements from Labyrinthomyces Microorganisms	Calazza, Nicky C. Wu, Maung N. Urano, Jun	15/066857 02/29/16	2016/0257965 04/08/16	9932599 04/03/18
US		Regulatory Elements from Labyrinthomyces Microorganisms	Calazza, Nicky C. Wu, Maung N. Urano, Jun	15/916171 03/06/18	2018/0201941 07/19/18	
US		Enhanced Productivity by Attenuation of Chlorophyll Binding Protein Genes	Meuser, Jonathan E. Dipertito, Kristen G. McCarren, Jay Bailey, Shaun	15/299457 10/20/16	2017/0114107 04/27/17	
US		Compositions and Methods for High Efficiency In Vivo Genome Editing	Verruto, John H. Moellering, Eric R.	14/986492 12/31/15	2017/0073695 03/15/17	
US		Microorganisms for Fatty Acid Production Using Elongase and Desaturase Enzymes	Calazza, Nicky Fieltrieg, Elizabeth Urano, Jun Wu, Maung Nyan Radakowits, Randor R.	15/068448 01/11/16	2016/0254985 09/15/16	
US		Tamper-Resistant Assembly for Securing Valuable Material	Warden, Laurence Newman-Lehman, Tel Gibson, Daniel G.	14/702378 05/01/15	2015/0314927 11/05/15	9791668 09/05/17
US		Tamper-Resistant Assembly for Securing Valuable Material	Warden, Laurence Newman-Lehman, Tel Gibson, Daniel G.	15/682288 08/21/17	2017/0341834 11/30/17	10017306 07/10/18
US		Expression of Type I Fatty Acid Synthase Genes in Eukaryotic Algae	Moellering, Eric R. Yu, Weidong Verruto, John H. Boessler, Paul G.	15/394414 12/29/15	2017/0191094 07/05/17	

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SGI IP Portfolio  
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UP=US Pending    CN=US Issued  
FP=Foreign Pending    CR=Converted  
NT=Not Pinned    BC=EP Granted  
FG=Foreign Granted

Qty	Year	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
1	US	Lid Mechanism	Warden, Laurence Beaver, Scott Wayne Becker, Mark Henry	14/800113 07/15/15	2016/0016163 01/21/16	9448407 09/20/16
1	US	Protein Rich Food Ingredient from Biomass and Methods of Preparation	Rutt, George Clifford Flatt, James H. Domaille, Peter Toledo, Gerardo V.	14/809051 07/24/15	2017/0030159 01/25/17 2017/0196238 07/13/17 (Corrected Publ)	
1	US	Protein Rich Food Ingredient from Biomass and Methods of Preparation	Rutt, George Clifford Flatt, James H. Domaille, Peter Toledo, Gerardo V.	15/328756 07/24/15 371	2017/0208835 07/27/17	
1	US	Protein Rich Food Ingredient from Biomass and Methods of Production	Rutt, George Clifford Flatt, James H. Domaille, Peter Toledo, Gerardo V. Dusaque, Daniel G.	15/005695 01/25/16	2016/0135480 05/13/16	
1	US	Microorganisms Having Increased Lipid Production, and Compositions, and Methods of Making and Using the Same	Moellering, Eric R. Carlson, Thomas J.	15/702353 07/23/18		
1	US	Compositions and Methods for Expressing Genes in Algae	Moellering, Eric R. Edwards, Amanda R. Bauman, Nicholas	15/365944 11/30/16	2017/0152520 06/01/17	10041079 08/07/18
1	US	Compositions and Methods for Expressing Genes in Algae	Moellering, Eric R. Edwards, Amanda R. Bauman, Nicholas	16/056359 08/06/18		
1	US	Algal Mutants with Increased Lipid Productivity	Ajjawi, Imad Sorjaga, Leah Aqui, Moena Moellering, Eric R.	15/341998 11/02/16	2017/0131742 05/04/17	
1	US	Microorganisms having Increased Lipid Productivity	Ajjawi, Imad Moellering, Eric R. Sorjaga, Leah Aqui, Moena	15/210945 07/14/16	2017/0058003 03/02/17	
1	US	Algal Chloroplastic SRP54 Mutants	Dipemio, Kristen McCann, Jay Sorjaga, Leah	15/130866 09/15/16	2016/0104896 10/20/16	
1	US	Genetically Engineered Vibrio sp. and Uses Thereof	Weinstock, Matthew T Wilson, Christopher M. Hisek, Eric D.	15/367108 12/01/16		
1	US	Protein-Containing Material from Biomass and Methods of Production	Scholten, Johannes Lakshmanaswamy, A. Burke, Joel Rutt, George C.	15/817132 01/26/17	2017/0206034 07/27/17	
1	US	Synthesis of POCA and POCA Precursors from Gluconic Acid Derivatives	Katibourakis, Spiros Griffin, Benjamin M.	15/202398 07/06/16	2017/0050944 02/23/17	10367161 10/02/2018
1	US	Recombinant RNA Particles and Methods of Producing Proteins	Brown, Robert C. Kanrud, Kurt J.	15/236144 08/12/16	2017/0044555 02/16/17	
1	US	Device and Methods for Biologic Transformation	Edwards, Amanda R. Verruto, John H.	15/343064 11/02/16	2017/0130238 05/11/17	
1	US	Improving Algal Lipid Productivity via Genetic Modification of a TPR Domain Containing Protein	Verruto, John H. Moellering, Eric R. Ajjawi, Imad	16/213928 12/7/18		
1	US	Improving Algal Lipid Productivity via Genetic Modification of a TPR Domain Containing Protein	Verruto, John H. Moellering, Eric R. Ajjawi, Imad	PCT/US2018/04505 12/7/18		
1	US	Methods for Assembling DNA Molecules	Gill, John E. Gibson, Daniel G. Fu, Lizhi	15/839597 12/13/17	2018/0183284 06/14/18	

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SGI IP Portfolio  
February 2019

UP=US Pending    LP=US Issued  
FP=Foreign Pending    CP=Converted  
FG=Foreign Granted    NP=Not Pinned  
EQ=EP Granted

Qty	Use	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
US		Production of Proteins in Labyrinthulomycetes	Calazza, Nicky C. Urano, Jun Wu, Maung N. Boles, Kent S.	15/460038 03/15/17	2017/0268015 09/21/17	
US		Improving Algal Lipid Productivity via Genetic Modification of a Signaling Protein	Ajawi, Imad	16/209,655 12/04/18		
US		Improving Algal Lipid Productivity via Genetic Modification of a Signaling Protein	Ajawi, Imad	PCT/US2018/63717 12/04/18		
US		Genetically Engineered Vibrio Sp. and Uses Thereof	Weinstock, Matthew T. Wilson, Christopher M.	15/667373 08/25/17	2018/0057824 03/01/18	
US		Expression of Modified Glycoproteins and Glycosites	Calazza, Nicky C.	15/799785 10/31/17	2018/0119193 05/03/18	
US		Expression of Modified Glycoproteins and Glycosites	Calazza, Nicky C.	15/967202 01/30/18	2018/0251569 09/06/2018	
US		High Productivity Algal Mutants having Reduced Photosynthetic Antenna	Moellering, Eric R. Bauman, Nicholas Radakovits, Randor R. Spreafico, Roberto Kuzminov, Fedor Ajawi, Imad Imam, Saheed Schultz, Andrew Kwek, Kathleen Aqul, Moena Nominig, Jennifer Verruto, John H. Bailey, Shaun	15/839094 12/29/17	2018/0166842 02/05/18	
US		Polypeptides with Type V CRISPR Activity and Uses Thereof	Monds, Russell D. Mantovani, Simone M. Komor, Russell S. LaPave, Matthew C. Kannan, Krishna Lakshina, Joseph W. Lucas, Joseph S. Moellering, Eric R.	15/953286 04/12/18		
US		Vibrio Sp. Organisms with Modified Lipopolysaccharide	Weinstock, Matthew T. Gibson, Daniel G. Shimling, Daniel	16/154618 10/06/2018		
US		Organisms and Methods for Producing Glycomolecules with Low Sulfation	Calazza, Nicky C. Urano, Jun	15/638798 03/08/18		
US		Recombinant Organisms and Methods for Producing Glycomolecules with Low Sulfation	Calazza, Nicky Urano, Jun Kambourakis, Spiros	15/665197 05/01/18		
US		Genetic Modulation of Photosynthetic Organisms for Improved Growth	Ajawi, Imad Kuzminov, Fedor I. Radakovits, Randor R. Verruto, John H. Polts, Sarah J. Spreafico, Roberto Lambert, William F. Gibson, Daniel G.	16/234,279 12/27/18		
US		Recombinant Organisms and Methods for Producing Glycomolecules with High Glycan Occupancy	Calazza, Nicky Urano, Jun Kambourakis, Spiros	15/665270 05/01/18		

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SGI IP Portfolio  
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UP=US Pending    UP=US Issued  
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N1=Not Pinned    EQ=EP Granted  
FG=Foreign Granted

Qty	Class	Title	Inventors	Application No. Filing Date	Publ. No. Date	Patent No. Issue Date
US		Polypeptides with Type V CRISPR Activity and Uses Thereof	Monds, Russell D. Mantovani, Simone M. Kantor, Russell S. LaFave, Matthew C. Kannan, Krishna LaManna, Joseph W. Lucas, Joseph E. Moellering, Eric R.	62/657489 04/13/18		
US		AVOIDING EPIGENETIC SILENCING OF EXOGENOUS NUCLEIC ACID IN ALGAE	Pais, Julie Spezifio, Roberto	62/779,364 12/13/18		
US		Controlled Gene Expression in Algae	Johit Verruto	62/782,153 13/19/18		
US	SGV1	Amplification and Cloning of Single DNA Molecules Using Rolling Circle Amplification	Hutchison, Clyde A. Smith, Hamilton O.	11/919515 10/29/07 371	2009/0176280 07/09/09	8497069 07/30/13
US	SGV1	In Vitro Recombination Method	Young, Lei Smith, Hamilton O. Gibson, Daniel G.	11/502746 08/11/06	2007/0037197 02/15/07	7723077 05/25/10
US	SGV1	In Vitro Recombination Method	Young, Lei Smith, Hamilton O. Gibson, Daniel G.	12/750571 03/30/10	2010/0184187 07/22/10	8534251 04/03/17
US	SGV1	In Vitro Recombination Method	Young, Lei Smith, Hamilton O. Gibson, Daniel G.	15/385537 11/20/16	2017/0233764 08/17/17	
US	SGV1	Method for In Vitro Recombination	Gibson, Daniel G. Smith, Hamilton O.	11/502624 08/11/06	2007/0037196 02/15/07	7776532 08/17/10
US	SGV1	Method for In Vitro Recombination	Gibson, Daniel G. Smith, Hamilton O.	12/620861 06/22/10	2010/0131126 12/09/10	8435736 05/07/13
US	SGV3	Synthesis of Error-Minimized Nucleic Acid Oligonucleotides	Young, Lei	11/633686 12/04/06	2007/120849 06/07/07	7704690 04/27/10
US	SGV1	Installation of Genomes or Partial Genomes into Cells or Cell-like Systems	Glass, John J. Young, Lei Lartigue, Carole Assad-Garcia, Nancyra Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig	11/644713 12/23/06	2007/0269862 11/23/07	8434974 08/05/16
US	SGV1	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.	11/633355 12/06/06	2007/0269688 11/15/07	15041060 08/07/16
US	SGV1	Synthetic Genomes	Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O. Gibson, Daniel G.			
US		Recombinant Hydrogen-Producing Cyanobacterium and Uses Thereof	Xu, Qing Smith, Hamilton O.	12/446929 04/16/09	2010/0251651 11/18/10 371	8359744 10/14/18
US	SGV1	Assembly of Large Nucleic Acids	Gibson, Daniel G. Benders, Guynead A. Young, Lei Glass, John J. Venter, J. Craig Hutchison, Clyde A. Smith, Hamilton O.	12/247126 10/07/08	2009/0275086 11/05/09	8593329 03/14/17

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Qty	Year	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
US	SGV1	Methods of Genome Installation in a Recipient Host Cell	Lartigue, Carole Glass, John I. Apejovich, Mira Hutchison, Clyde A. Smith, Hamilton O. Venter, J. Craig Merryman, Charles Vashee, Sanjay	12/589414 10/30/09 371	2011/0048592 03/24/11	9481880 11/01/16
US	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	12/371543 02/13/09	2010/0035788 02/11/10	8868999 03/03/15
US	SGV1	Methods for In Vitro Joining and Combinatorial Assembly of Nucleic Acid Molecules	Gibson, Daniel G. Smith, Hamilton O. Hutchison, Clyde A. Young, Lei Venter, J. Craig	14/636082 03/03/15	2015/0240280 08/27/15	
US	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Vashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Neskov, Vladimir N. Czuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	12/718911 03/05/10	2011/0053272 03/03/11	9273310 03/01/16
US	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Vashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Neskov, Vladimir N. Czuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	CTP 12/783489 05/19/18	2011/0053273 03/03/11	9267132 02/23/16
US	SGV1	Methods for Cloning and Manipulating Genomes	Benders, Gwynedd A. Glass, John I. Hutchison, Clyde A. Lartigue, Carole Vashee, Sanjay Agire, Nikkel A. Smith, Hamilton O. Merryman, Charles E. Neskov, Vladimir N. Czuang, Ray-Yuan Venter, J. Craig Gibson, Daniel G.	15/051463 02/23/16	2016/0177322 06/23/16	
US	SGV1	Encoding Text into Nucleic Acid Sequences	Hutchison, Clyde A. Montague, Michael G. Smith, Hamilton O.	15/052781 02/24/16	2016/0168579 08/16/16	
US		Crowding Agent-Induced Nucleic Acid Transfer into a Recipient Host Cell	Karas, Bogumil J. Hutchison, Clyde A. Smith, Hamilton O.	14/015070 08/30/13	2014/0179001 06/25/14	920643E 12/08/15
US		Microbial Fuel Cell	Brefechger, Cranna Wanger, Greg	13/692087 05/10/13	2013/0302703 11/14/13	
US		High Efficiency Method for Algal Transformation	Karas, Bogumil J. Weyman, Philip D. Dupont, Christopher L. Allen, Andrew F.	15/048882 02/19/16	2016/0244720 08/25/16	

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NT=Not Pinned      EQ=EP Granted  
PG=Foreign Granted

Cty	Use	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
US		Generation of Synthetic Genomes	Hutchison, Clyde A. Chuang, Ray-Yuan Noskov, Vladimir N. Karas, Ropumil J. Wise, Kim S. Smith, Hamilton O. Glass, John I. Merriman, Charles E. Gibson, Daniel G. Venter, J. Craig Kannan, Krishna	15/468675 03/22/17	2018/0119132 05/03/18	
US	SGI	Method for Producing Polymers	Stähler, Peer F. Stähler, Cord F. Müller, Manfred	371 09/06/00 02/18/00		6886211 07/01/03
US	SGI	Method for Producing Polymers	Stähler, Peer F. Stähler, Cord F. Müller, Manfred	12/400493 02/18/00	2009/0170802 07/02/09	6568839 02/14/17
US	SGI	Method for Producing Polymers	Stähler, Peer F. Stähler, Cord F. Müller, Manfred	15/428880 02/07/17	2017/0147748 05/25/17	
US	SGI	Method for Producing Polymers	Stähler, Peer F. Stähler, Cord F. Müller, Manfred	10/455368 02/18/00	2003/0198948 10/23/03	7790369 09/07/10
US	SGI	Synthesis of Sequence-Verified Nucleic Acids	Stähler, Peer F. Carapito, Raphael Stähler, Cord F. Matzas, Mark Leonard, Jack T. Jaeger, Joachim Baker, Markus	12/708783 02/19/10	2010/0216648 08/25/10	
US	SGI	Synthesis of Sequence-Verified Nucleic Acids	Stähler, Peer F. Carapito, Raphael Stähler, Cord F. Matzas, Mark Leonard, Jack T. Jaeger, Joachim Baker, Markus	15/468532 03/21/17	2017/0267989 09/21/17	
US	SGI	Programmable Oligonucleotide Synthesis	Stähler, Peer F. Carapito, Raphael	371 12/438425 08/23/07	2010/0015668 01/21/10	6172368 06/08/12
US	SGI	Programmable Oligonucleotide Synthesis	Stähler, Peer F. Carapito, Raphael	13/441186 08/23/07	2012/0196757 08/02/12	8367335 02/05/13
US	SGI	Programmable Oligonucleotide Synthesis	Stähler, Peer F. Carapito, Raphael	13/741271 01/14/13	2013/0130321 05/23/13	9644225 05/09/17
US	SGI	Programmable Oligonucleotide Synthesis	Stähler, Peer F. Carapito, Raphael	15/589837 05/08/17	2017/0240956 08/24/17	
US	SGI	Recombinant Arterivirus Replicon Systems and Uses Thereof	Kamrud, Kurt Wang, Nathaniel S. Felderman, Martha Carnio, Nancy	15/486131 04/12/17	2017/0314043 11/01/17	
US	SGI	Recombinant Virus Replicon Systems and Uses Thereof	Kamrud, Kurt I.	15/723658 10/03/17	2018/0104359 04/19/18	
US	SGI	Compositions and Methods for Enhancing Gene Expression	Kamrud, Kurt I. Win, Maung N. Wang, Nathaniel S. Dehart, Jason L.	15/831230 12/04/17	2018/0171340 06/21/18	
US	SGI	Induce and Enhance Immune Responses using Recombinant Replicon Systems	Kamrud, Kurt I. Wang, Nathaniel S. Alahmed, Farhan Dehart, Jason L.	16/251928 01/18/19		

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UP=US Pending    UP=US Issued  
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N1=Not Pinned    EQ=EP Granted  
FG=Foreign Granted

Clty	Use	Title	Inventors	Application No. Filing Date	Publn No. Date	Patent No. Issue Date
WO		Genetic Modulation of Photo	Ajawi, Imad Kuzminov, Fedor I. Radakovits, Rando R. Verruto, John H. Potts, Sarah J. Spreafico, Roberto Lambert, William F. Cramer, Jessica M.	PC7/US2018/66712 12/27/18		
ZA		Secretion of Fatty Acids by Photosynthetic Microorganisms	Roesler, Paul Chen, You Liu, Bo Ding, Cong	201004253 12/11/08		2010/04253 08/31/11
ZA	BP	Methods to Simulate Biogenic Methane Production from Hydrocarbon-bearing Formations	Toledo, Gerardo V. Richardson, Toby Sling, Ulrich Mafun, Eric J. Venter, J. Craig	2010/07841 05/12/09		2010/07841 07/30/13
ZA		Production of Branched- Chain Alcohols by Photosynthetic Bifidobacterium	Roesler, Paul G. Liu, Bo Kristof, Jessica R.	2011/04352 12/10/09		2011/04352 09/26/12
ZA	MGRO	Method for High- Throughput Identification of Microbial Antagonists against Pathogens	Kerovuo, Janne S. McCann, Ryan T.	2013/02901 10/25/11		2013/02901 07/27/16
ZA	AGRD	Integrated Method for High-Throughput Identification of Novel Pesticidal Compositions and Uses Thereof	Grandic, Christopher J. Kerovuo, Janne S. Richardson, Toby H. Schwartz, Ariel S.	2014/01091 08/17/12		
ZA	SGV1	Encoding Text into Nucleic Acid Sequences	Hutchison, Clyde A. Montague, Michael G. Smith, Hamilton O.	2012/03447 10/29/10		
		Generation of Synthetic Genomes	Hutchison, Clyde A. Chuang, Ray-Yuan Noskov, Vladimir N. Karas, Bogumil J. Wise, Kim S. Smith, Hamilton O. Glass, John J. Martyman, Charles E. Gibson, Daniel G. Venter, J. Craig Kannan, Krishna	2017238212 09/14/18	2017/165565 09/28/17	
		Generation of Synthetic Genomes		3018139 09/18/18		
		Generation of Synthetic Genomes		17773051.1 03/23/17		

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EXHIBIT C

Trademarks

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**IP PORTFOLIO REPO**  
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**SYNTHETIC GENOMICS**

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 FP=Foreign Pending    CV=Converted  
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 FG=Foreign Granted    TB=To be filed  
 AB=Abandoned

Mark	Country	Mark comments	Class(es)	Application No. Filing Date	Reg. Date/Reg. No.
	US	GIBSON ASSEMBLY	1, 5, 9, and 10	85/977,312 12/14/2010	
	US	Color Logo	42	77/318122 06/28/07	3385070 02/19/08
	US	SYNTHETIC GENOMICS & Color Logo	42	77/317998 06/28/07	3385057 02/19/08
	US	B&W Logo	42	77/218188 06/26/07	3385078 02/19/08
	US	SYNTHETIC GENOMICS & b&w Logo	42	77/218175 06/28/07	3385075 02/19/08
	US	SYNTHETIC GENOMIC VACCINES & Logo	5 and 42	85/256811 03/02/11	
	US	SGVI & NEW LOGO	5 and 42	85/369384 07/12/11	4716677 04/07/15
	US	SYNTHETIC GENOMICS VACCINES & NEW LOGO	5 and 42	85/369410 07/13/11	4716678 04/07/15
<b>ARCHETYPE</b> ®	US	Word mark - black and white	9 and 42	85/173654 11/10/10	4202934 09/04/12

**Category**

- 1 - DNA Manip. & Synthetic Biology    2 - Apparatus
- 3 - New Generation Fuels & Chem.    4 - Coal Utilization
- 5 - Agricultural Solutions

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SYNTHETIC GENOMICS

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Mark	Country	Mark comments	Class(es)	Application No. Filing Date	Reg. Date/ Reg. No.
 Archetype®	US	Word + logo	9 and 42	85/173722 11/10/16	4202935 09/09/12
Oscella	US		9	87545344 07/27/12	
Oscella	US		42	87545355 07/27/12	
BioXP	US	Word mark - black and white	9, 42	87/890162 04/24/18	
 ®	MY	Color Logo	42	2007/25259 12/19/07	07025259 06/28/07
 ®	MY	SYNTHETIC GENOMICS & Color Logo	42	2007/25261 12/24/07	07025261 06/29/07
 ®	MY	B&W Logo	42	2007/25263 12/24/07	07025263 06/28/07
 ®	MY	SYNTHETIC GENOMICS & b&w logo	42	2007/25260 12/24/07	07025260 06/28/07
Oscella	MY	Malaysia	9	2019051391 01/22/18	
Oscella	MY	Malaysia	42	2019051396 01/22/18	
	MX	Color Logo	42	904176 12/19/07	1034527 04/14/08
	MX	B&W Logo	42	904175 12/19/07	1034526 04/14/08
ARCHETYPE®	MX	Word mark - black and white	9	1176988 05/10/11	1384558 05/10/11
ARCHETYPE®	MX	Word mark - black and white	42	1176983 05/10/11	1310119 09/07/12
 Archetype	MX	Word + logo	9	1176981 05/10/11	1384415 05/10/11
 Archetype	MX	Word + logo	42	1176978 05/10/11	1310118 09/07/12
	JP	Color Logo	42	A0072969 01/19/18	
	JP	SYNTHETIC GENOMICS & Color Logo	42	2007-126757 12/25/07	5159247 08/15/08
	JP	B&W Logo	42	2007-126756 12/25/07	5159246 08/15/08
	JP	SYNTHETIC GENOMICS & b&w logo	42	2007-126759 12/25/07	5160812 08/22/08
	JP	SYNTHETIC GENOMICS & b&w logo	42	2007-126758 12/25/07	5160811 08/22/08
 ®	JP	SGVI & NEW LOGO	5 and 42	2012-067522 09/21/12	5558063 02/15/13
 A	JP	Word mark - black and white	9 and 42	2011-031389 05/09/11	5461774 01/06/12

Category

- 1 - DNA Manip. & Synthetic Biology
- 2 - Apparatus
- 3 - New Generation Fuels & Chem.
- 4 - Coal Utilization
- 5 - Agricultural Solutions

CONFIDENTIAL

PATENT

2 of 5

REEL: 048655 FRAME: 0451

TRADEMARK  
REEL: 007102 FRAME: 0053

IP PORTFOLIO REPO  
3/8/2019



SYNTHETIC GENOMICS®

UF=US Filing    UA=US Issued  
FP=Foreign Pending    CV=Converted  
NT=Not Phase    EG=EP Granted  
FG=Foreign Granted    TB=To be filed    AB=Abandoned

Mark	Country	Mark comments	Class(es)	Application No. Filing Date	Reg. Date/Reg. No.
	JP	Word + logo	9 and 42	2011-91618 12/30/11	5493978 05/18/12
	JP	Word + logo	9 and 42	2011-031390 05/09/11	5461775 01/06/12
	JP	Word mark - black and white	1, 9, 42	2011-040564 06/13/11	5467385 02/02/12
	JP	Japan	9,42	A0072969 01/19/12	
	IN	SYNTHETIC GENOMICS VACCINES & NEW LOGO	3 and 42	2265446 01/12/12	
	IN	India	9,42	A0072969 01/19/12	
	FR	France	9,42	07/27/12	
	EP	Europe	9,42	1399016 01/19/12	
	CTM	Color Logo	42	006540901 12/27/07	006540901 11/19/08
	CTM	SYNTHETIC GENOMICS & Color Logo	42	006540629 12/27/07	006540629 11/19/08
	CTM	B&W Logo	42	006541171 12/27/07	006541171 11/19/08
	CTM	SYNTHETIC GENOMICS & b&w logo	42	006541081 12/27/07	006541081 11/19/08
	CTM	SYNTHETIC GENOMICS VACCINES & NEW LOGO	5 and 42	010557395 01/12/12	010557395 06/08/12
	CTM	Word mark - black and white	9 and 42	009953175 05/09/11	009953175 10/31/11
	CTM	Word + logo	9 and 42	009953191 05/09/2011	009953191 10/24/11
	CTM	Word mark - black and white	1, 9, 42	010040178 06/13/11	010040178 02/12/13
	CTM	Word mark - black and white	9, 42	017894395 05/02/12	
	CN	SYNTHETIC GENOMICS VACCINES & NEW LOGO	5	10415733 01/12/12	
	CN	SYNTHETIC GENOMICS VACCINES & NEW LOGO	42	10415732 01/12/12	
	CN	Word mark - black and white	9	9442501 05/10/11	9442501 08/07/12
	CN	Word mark - black and white	42	9442500 05/10/11	
	CN	Word + logo	9	9442499 05/10/11	9442499 08/07/12

Category

- 1 - DNA Manip & Synthetic Biology
- 2 - Apparatus
- 3 - New Generation Fuels & Chem.
- 4 - Coal Utilization
- 5 - Agricultural Solutions

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PATENT

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REEL: 048655 FRAME: 0452

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3/8/2019



SYNTHETIC GENOMICS®

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AB=Abandoned

Mark	Country	Mark comments	Class(es)	Application No. Filing Date	Reg. Date/ Reg. No.
ArcheType ®	CN	Word + logo	42	9442498 05/10/11	9442498 10/07/12
	CN	Word mark - black and white	1	9590368 06/14/11	9590368 09/07/12
GIBSON ASSEMBLY ®	CN	Word mark - black and white	9	9590367 06/14/11	9590367 09/07/12
GIBSON ASSEMBLY	CN	Word mark - black and white	42	9590366 06/14/11	
Oscella	CN	China	9,42	A0072969 01/19/18	
	CA	Color Logo	42	1376680 12/19/07	774491 08/13/10
	CA	SYNTHETIC GENOMICS & Color Logo	42	1376679 12/19/07	774658 08/16/10
	CA	B&W Logo	42	1376690 12/19/07	774340 08/13/10
	CA	SYNTHETIC GENOMICS & b&w logo	42	1376688 12/19/07	774443 08/13/10
SGVI Genetics for Sustainable Agriculture ArcheType	CA	SYNTHETIC GENOMICS VACCINES & NEW LOGO	5 and 42	1559633 01/12/12	
	CA	Word mark - black and white	9 and 42	1526947 05/09/11	TMAB76909 05/01/14
	CA	Word + logo	9 and 42	1526948 05/09/11	TMAB76911 05/01/14
ArcheType	CA	Word mark - black and white	1, 5, 9, 10, 42	1531444 06/13/11	877,824 05/13/14
	CA		9,42	1878742 01/22/18	
	BR	Color Logo	42	829524070 12/27/07	829524070 03/03/15
	BR	SYNTHETIC GENOMICS & Color Logo	42	829524029 12/27/07	829524029 10/22/13
	BR	B&W Logo	42	829524088 12/27/07	829524088 12/23/14
	BR	SYNTHETIC GENOMICS & b&w logo	42	829524037 12/27/07	829524037 04/22/15
SGVI Genetics for Sustainable Agriculture ArcheType	BR	SYNTHETIC GENOMICS VACCINES & NEW LOGO	5	831299827 01/12/12	831299827 02/10/15
	BR	SYNTHETIC GENOMICS VACCINES & NEW LOGO	42	831299843 01/12/12	831299843 02/18/15
	BR		9	914072382 01/24/18	
Oscella	BR		42	914072471 01/24/18	
	ALL	Color logo	42	1216104 12/19/07	1216104 05/26/08

Category  
1 - DNA Manip & Synthetic Biology 2 - Apparatus  
3 - New Generation Fuels & Chem. 4 - Coal Utilization  
5 - Agricultural Solutions

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PATENT 4 of 5  
REEL: 048655 FRAME: 0453

TRADEMARK  
REEL: 007102 FRAME: 0055

**IP PORTFOLIO REPO**  
3/8/2019



**SYNTHETIC GENOMICS**

UF=US Pending    UA=US Issued  
 FP=Foreign Pending    CV=Converted  
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 FG=Foreign Granted    EG=EP Granted  
 TB=To be filed    AB=Abandoned

Mark	Country	Mark comments	Class(es)	Application No. Filing Date	Reg. Date/ Reg. No.
	AU	SYNTHETIC GENOMICS & Color Logo	42	1216099 12/19/07	1216099 07/01/08
	AU	B&W Logo	42	1216113 12/19/07	1216113 5-26-08
	AU	SYNTHETIC GENOMICS & b&w logo	42	1216108 12/19/07	1216108 07/01/08
	AU	SYNTHETIC GENOMICS VACCINES & NEW LOGO	5 and 42	1469340 01/12/12	1469340 01/12/12
	AU	Word mark - black and white	9 and 42	1424068 05/09/11	1424068 05/09/11
	AU	Word + logo	9 and 42	1424067 05/09/11	1424067 05/09/11
	AU	Word mark - black and white	1*, 5, 9*, 10, 42* *Registered	1430243 06/10/11	1430243 06/10/11
Oscella	AU		9, 42	A0072869 01/19/18	

**Category**

- 1 - DNA Manip. & Synthetic Biology
- 2 - Apparatus
- 3 - New Generation Fuels & Chem.
- 4 - Coal Utilization
- 5 - Agricultural Solutions

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PATENT

5 of 5

REEL: 048655 FRAME: 0454

**TRADEMARK**  
REEL: 007102 FRAME: 0056



EXHIBIT D

Mask Works

Description

Registration/  
Application  
Number

Registration/  
Application  
Date

30340830V3

RECORDED: 03/20/2019

PATENT

REEL: 048655 FRAME: 0455

TRADEMARK  
REEL: 007102 FRAME: 0057

505917522 02/14/2020

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT5964239

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	SECURITY INTEREST
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
SYNTHETIC GENOMICS, INC.	01/24/2020
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	OXFORD FINANCE LLC
<b>Street Address:</b>	133 NORTH FAIRFAX STREET
<b>City:</b>	ALEXANDRIA
<b>State/Country:</b>	VIRGINIA
<b>Postal Code:</b>	22314
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	16509095
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(404)885-3900
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
<b>Phone:</b>	4048853868
<b>Email:</b>	rusty.close@troutman.com
<b>Correspondent Name:</b>	CHRISTOPHER CLOSE
<b>Address Line 1:</b>	TROUTMAN SANDERS LLP
<b>Address Line 2:</b>	600 PEACHTREE STREET NE, SUITE 3000
<b>Address Line 4:</b>	ATLANTA, GEORGIA 30308-2216
<b>ATTORNEY DOCKET NUMBER:</b>	030690.000077
<b>NAME OF SUBMITTER:</b>	CHRISTOPHER C CLOSE, JR.
<b>SIGNATURE:</b>	/Christopher C. Close Jr./
<b>DATE SIGNED:</b>	02/14/2020
<b>Total Attachments: 9</b>	
source=Oxford - Synthetic - Amended and Restated Intellectual Property Security Agreement (executed)#page1.tif	
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source=Oxford - Synthetic - Amended and Restated Intellectual Property Security Agreement (executed)#page4.tif	
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PATENT  
REEL: 051820 FRAME: 0817TRADEMARK  
REEL: 007102 FRAME: 0058

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**PATENT**  
**REEL: 051820 FRAME: 0818**

**TRADEMARK**  
**REEL: 007102 FRAME: 0059**

## AMENDED AND RESTATED INTELLECTUAL PROPERTY SECURITY AGREEMENT

This Amended and Restated Intellectual Property Security Agreement is entered into as of January 24, 2020, by and among OXFORD FINANCE LLC, a Delaware limited liability company with an office located at 133 North Fairfax Street, Alexandria, Virginia 22314 ("Oxford"), as collateral agent for the Lenders listed on Schedule I.I of the Loan Agreement (as defined below) or otherwise a party thereto from time to time (in such capacity, "Collateral Agent"), and SYNTHETIC GENOMICS, INC., a Delaware corporation ("Parent"), GENOVIA BIO, LLC, a Delaware limited liability company, GREEN RESOURCES, LLC, a Maryland limited liability company, and SYNTHETIC GENOMICS VACCINES, INC., a Delaware corporation (including Parent, individually and collectively, jointly and severally, "Borrower"), each with offices located at 11149 North Torrey Pines Road, La Jolla, CA 92037 (including Parent, individually and collectively, jointly and severally, "Grantor").

### RECTALS

A. The Lenders agreed to make certain advances of money and to extend certain financial accommodations to Grantor (the "Loans") in the amounts and manner set forth in that certain Loan and Security Agreement by and among the Collateral Agent, Lenders and Grantor dated as of July 31, 2017 (as amended, supplemented or otherwise modified from time to time, including, but without limitation, by that certain Forbearance Agreement, Consent and Third Amendment to Loan and Security Agreement dated as of March 7, 2019, the "Loan Agreement"; capitalized terms used but not otherwise defined herein shall have the meaning ascribed to such terms in the Loan Agreement). In accordance with the terms of the Loan Agreement, Grantor is granting to Collateral Agent, for the ratable benefit of the Lenders, a security interest in the Intellectual Property Collateral (as defined below) to secure the obligations of Grantor under the Loan Agreement.

B. Grantor has already granted to Collateral Agent, for the ratable benefit of the Lenders, a security interest in all of Grantor's right, title and interest, whether presently existing or hereafter acquired, in, to and under all of the Collateral.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, and intending to be legally bound, as collateral security for the prompt and complete payment when due of its obligations under the Loan Agreement, Grantor hereby represents, warrants, covenants and agrees as follows:

### AGREEMENT

To secure its obligations under the Loan Agreement, effective as of the date hereof, Grantor hereby grants and pledges to Collateral Agent, for the ratable benefit of the Lenders, a security interest in all of Grantor's right, title and interest in, to and under its intellectual property (all of which shall collectively be called the "Intellectual Property Collateral"), including, without limitation, the following:

- (a) Any and all copyright rights, copyright applications, copyright registrations and like protections in each work or authorship and derivative work thereof, whether published or unpublished and whether or not the same also constitutes a trade secret, now or hereafter existing, created, acquired or held, including without limitation those set forth on Exhibit A attached hereto (collectively, the "Copyrights");
- (b) Any and all trade secrets, and any and all intellectual property rights in computer software and computer software products now or hereafter existing, created, acquired or held;

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PATENT  
REEL: 051820 FRAME: 0819

TRADEMARK  
REEL: 007102 FRAME: 0060

(c) Any and all design rights that may be available to Grantor now or hereafter existing, created, acquired or held;

(d) All patents, patent applications and like protections including, without limitation, improvements, divisions, continuations, renewals, reissues, extensions and continuations-in-part of the same, including without limitation the patents and patent applications set forth on Exhibit B attached hereto (collectively, the "Patents");

(e) Any trademark and servicemark rights, whether registered or not, applications to register and registrations of the same and like protections, and the entire goodwill of the business of Grantor connected with and symbolized by such trademarks, including without limitation those set forth on Exhibit C attached hereto (collectively, the "Trademarks");

(f) All mask works or similar rights available for the protection of semiconductor chips, now owned or hereafter acquired, including, without limitation those set forth on Exhibit D attached hereto (collectively, the "Mask Works");

(g) Any and all claims for damages by way of past, present and future infringements of any of the rights included above, with the right, but not the obligation, to sue for and collect such damages for said use or infringement of the intellectual property rights identified above;

(h) All licenses or other rights to use any of the Copyrights, Patents, Trademarks, or Mask Works and all license fees and royalties arising from such use to the extent permitted by such license or rights;

(i) All amendments, extensions, renewals and extensions of any of the Copyrights, Trademarks, Patents, or Mask Works; and

(j) All proceeds and products of the foregoing, including without limitation all payments under insurance or any indemnity or warranty payable in respect of any of the foregoing.

Notwithstanding the right to sue and collect granted in clause (g) above, Collateral Agent shall not exercise such right to sue and collect unless (i) an Event of Default has occurred and is continuing, or (ii) Grantor has failed to pursue such claim within ten (10) days of a determination by Grantor and Collateral Agent that the pursuit of such claim is necessary to preserve the value of, or prevent any further diminution of value to, the underlying Intellectual Property Collateral.

Grantor hereby represents and warrants that the Copyrights set forth on Exhibit A, the Patents set forth on Exhibit B and the Trademarks set forth on Exhibit C include all Copyrights, Patents and Trademarks of Grantor and its Subsidiaries that are either registered, or for which applications for registration or grant, as applicable, are pending, on the date hereof. Grantor hereby covenants to provide prompt notice of (A) any material change in the composition of the Intellectual Property, and (B) any new Copyrights, Trademarks, Patents, or Mask Works of Grantor or any of its Subsidiaries that are either registered or for which an application for registration or grant is filed.

This security interest is granted in conjunction with the security interest granted to Collateral Agent, for the ratable benefit of the Lenders under the Loan Agreement, and shall become effective upon the date hereof. The rights and remedies of Collateral Agent with respect to the security interest granted hereby are in addition to those set forth in the Loan Agreement and the other Loan Documents, and those which are now or hereafter available to Collateral Agent as a matter of law or equity. Each right, power and remedy of Collateral Agent provided for herein or in the Loan Agreement or any of the Loan Documents, or now

or hereafter existing at law or in equity shall be cumulative and concurrent and shall be in addition to every right, power or remedy provided for herein and the exercise by Collateral Agent of any one or more of the rights, powers or remedies provided for in this Amended and Restated Intellectual Property Security Agreement, the Loan Agreement or any of the other Loan Documents, or now or hereafter existing at law or in equity, shall not preclude the simultaneous or later exercise by any person, including Collateral Agent, of any or all other rights, powers or remedies.

This Amended and Restated Intellectual Property Security Agreement may be executed in several counterparts, each of which shall constitute an original and all of which, when taken together, shall constitute one agreement. The exchange of a fully executed Amended and Restated Intellectual Property Security Agreement (in counterparts or otherwise) by electronic transmission in PDF format or by facsimile shall be sufficient to bind the parties to the terms and conditions of this Amended and Restated Intellectual Property Security Agreement.

This Amended and Restated Intellectual Property Security Agreement hereby amends, restates and consolidates in their entirety, without novation, the Intellectual Property Security Agreement dated as of March 7, 2019 between Collateral Agent and Grantor.

[Signature page follows.]

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**PATENT**  
**REEL: 051820 FRAME: 0821**

**TRADEMARK**  
**REEL: 007102 FRAME: 0062**

IN WITNESS WHEREOF, the parties have caused this Amended and Restated Intellectual Property Security Agreement to be duly executed by its officers thereunto duly authorized as of the first date written above.

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

Address of Grantor:

11149 North Torrey Pines Road  
La Jolla, CA 92037  
Attn:

GRANTOR:

SYNTHETIC GENOMICS, INC.

By: 

Title: CEO

GENOVIA BIO, LLC

By: 

Title: CEO Synthetic Genomics, its sole member

GREEN RESOURCES, LLC

By: 

Title: CEO Synthetic Genomics, its sole member

SYNTHETIC GENOMICS VACCINES, INC.

By: 

Title: CEO

[Signature Page - Amended and Restated IP Security Agreement]

PATENT  
REEL: 051820 FRAME: 0822

TRADEMARK  
REEL: 007102 FRAME: 0063

Address of Collateral Agent:


133 North Fairfax Street  
Alexandria, Virginia 22314  
Attn: Legal Department

COLLATERAL AGENT:

OXFORD FINANCE LLC, AS COLLATERAL  
AGENT

By:

Title:

  
Collette H. Festivity  
Senior Vice President

2  
[Signature Page--Amended and Restated IP Security Agreement]

PATENT  
REEL: 051820 FRAME: 0823

TRADEMARK  
REEL: 007102 FRAME: 0064



EXHIBIT A

Copyrights

None.

PATENT

REEL: 051820 FRAME: 0824

TRADEMARK

REEL: 007102 FRAME: 0065

EXHIBIT B

Patents

No.	Description	Application Number	Registration Number
1.	MICROORGANISMS ENGINEERED FOR INCREASED PRODUCTIVITY	16/509,095 (07/11/2019)	

PATENT

REEL: 051820 FRAME: 0825

TRADEMARK

REEL: 007102 FRAME: 0066

EXHIBIT C

Trademarks

No.	Description	Serial Number	Registration Number
1.	VIRIDOS	88/705,882 (11/25/2019)	

PATENT  
REEL: 051820 FRAME: 0826

TRADEMARK  
REEL: 007102 FRAME: 0067

EXHIBIT D

Mask Works

None:

RECORDED: 02/14/2020

PATENT  
REEL: 051820 FRAME: 0827

RECORDED: 11/10/2020

TRADEMARK  
REEL: 007102 FRAME: 0068