

**TRADEMARK ASSIGNMENT**

Electronic Version v1.1  
 Stylesheet Version v1.1

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	SECURITY INTEREST

**CONVEYING PARTY DATA**

Name	Formerly	Execution Date	Entity Type
Helicos BioSciences Corporation		11/18/2010	CORPORATION: DELAWARE

**RECEIVING PARTY DATA**

<b>Name:</b>	General Electric Capital Corporation
<b>Street Address:</b>	2 Bethesda Metro Center
<b>Internal Address:</b>	Suite 600
<b>City:</b>	Bethesda
<b>State/Country:</b>	MARYLAND
<b>Postal Code:</b>	20814
<b>Entity Type:</b>	CORPORATION: DELAWARE

**PROPERTY NUMBERS Total: 8**

Property Type	Number	Word Mark
<b>Registration Number:</b>	3648788	HELICOS
<b>Serial Number:</b>	77114088	HELICOS BIOSCIENCES CORPORATION
<b>Serial Number:</b>	77114083	
<b>Serial Number:</b>	77065289	HELISCOPE
<b>Serial Number:</b>	77193551	SMS GRADE
<b>Serial Number:</b>	77193563	SMS GRADE
<b>Serial Number:</b>	77193460	VIRTUAL TERMINATOR
<b>Serial Number:</b>	77193450	VIRTUAL TERMINATOR

**CORRESPONDENCE DATA**

Fax Number: (404)541-4710  
*Correspondence will be sent via US Mail when the fax attempt is unsuccessful.*  
 Phone: 404-815-8042  
 Email: laallen@klpatrickstockton.com  
 Correspondent Name: Lizzie Buchanan, Esq.

**900175796**

**TRADEMARK  
 REEL: 004418 FRAME: 0206**

OP \$215.00 3648788

Address Line 1: Kilpatrick Stockton LLP  
Address Line 2: 1100 Peachtree Street, Suite 2800  
Address Line 4: Atlanta, GEORGIA 30309

ATTORNEY DOCKET NUMBER:	352272
NAME OF SUBMITTER:	Latosha E. Allen
Signature:	/Latosha E. Allen/
Date:	11/18/2010

**Total Attachments: 52**

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INTELLECTUAL PROPERTY SECURITY AGREEMENT

This INTELLECTUAL PROPERTY SECURITY AGREEMENT (this "Agreement"), dated as of November 16, 2010, is made by HELICOS BIOSCIENCES CORPORATION, a Delaware corporation ("Grantor"), in favor of GENERAL ELECTRIC CAPITAL CORPORATION, a Delaware corporation, as agent (the "Agent").

**WITNESSETH:**

WHEREAS, Grantor, Agent and certain other financial institutions from time to time as party thereto as lenders ("Lenders") are parties to the Loan and Security Agreement, dated as of December 31, 2007 (as amended, restated, supplemented or otherwise modified from time to time, the "Loan Agreement"), pursuant to which Lenders have agreed to provide to Grantor certain loans and other extensions of credit in accordance with the terms and conditions thereof; and

WHEREAS, pursuant to the Loan Agreement, as amended by that certain Consent and Fourth Amendment to Loan and Security Agreement, dated as even date herewith, by and among Grantor, Agent and Lenders (the "Fourth Amendment"), and in consideration of the amendments provided for the benefit of Grantor thereunder, Grantor is required to execute and deliver this Agreement.

NOW, THEREFORE, in consideration of the premises and mutual covenants herein contained and to induce Agent and Lenders to enter into the Fourth Amendment and to induce Lenders to continue to make extensions of credit to Grantor under the Loan Agreement, Grantor hereby agrees with Agent and Lenders and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, as follows:

Section 1. Defined Terms. Capitalized terms used herein without definition are used as defined in the Loan Agreement.

Section 2. Grant of Security Interest in Intellectual Property Collateral. Grantor, as collateral security for the prompt and complete payment and performance when due (whether at stated maturity, by acceleration or otherwise) of the Obligations hereby mortgages, pledges and hypothecates to Agent, for the benefit of itself and the Lenders, and grants to Agent, for the benefit of itself and the Lenders, a Lien on and security interest in, all of its right, title and interest in, to and under the following Collateral of Grantor (the "Intellectual Property Collateral"):

(a) all of its trade secrets and rights under any written agreement granting any right to use trade secrets;

(b) all of its copyrights and rights under any written agreement granting any right to use copyrights, including, without limitation, those referred to on Schedule 1 hereto, together with all renewals, reversions and extensions of the foregoing;

(c) all of its trademarks and rights under any written agreement granting any right to use trademarks, including, without limitation, those referred to on Schedule 2 hereto, together with all renewals, reversions and extensions of the foregoing;

(d) all goodwill of the business connected with the use of, and symbolized by, each such trademark covered by (c) above;

(e) all of its US patents and rights under any written agreement granting any right to use US patents, including, without limitation, those owned by Grantor referred to on Schedule 3 hereto, together with all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of the foregoing;

(f) all of its US patent applications and rights under any written agreement granting any right to use US patent applications, including, without limitation, those owned by Grantor referred to on Schedule 4 hereto, together with all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of the foregoing;

(g) all of its PCT patent applications and rights under any written agreement granting any right to use PCT patent applications, including, without limitation, those owned by Grantor referred to on Schedule 5 hereto, together with all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of the foregoing;

(h) all of its foreign patents and patent applications, and rights under any written agreement granting any right to use foreign patents and patent applications, including, without limitation, those owned by Grantor referred to on Schedule 6 hereto, together with all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of the foregoing;

(i) all applications, registrations, claims, products, awards, judgments, amendments, improvements and insurance claims related thereto now or hereafter owned or licensed by Grantor, or any claims for damages by way of any past, present, or future infringement of any of the foregoing, together with all accessions and additions thereto, proceeds and products thereof (including, without limitation, any proceeds resulting under insurance policies); provided, further, that the Intellectual Property Collateral shall include, without limitation, all cash, royalty fees, other proceeds, accounts and general intangibles that consist of rights of payment to or on behalf of Grantor or proceeds from the sale, licensing or other disposition of all or any part of, or rights in, the Intellectual Property Collateral by or on behalf of Grantor; and

(j) all income, royalties, proceeds and liabilities at any time due or payable or asserted under and with respect to any of the foregoing, including, without limitation, all rights to sue and recover at law or in equity for any past, present and future infringement, misappropriation, dilution, violation or other impairment thereof.

Notwithstanding the foregoing the term "Intellectual Property Collateral" shall not include: any contract, instrument or chattel paper in which Grantor has any right, title or interest if and to the extent such contract, instrument or chattel paper includes a provision containing a restriction on assignment such that the creation of a security interest in the right, title or interest of Grantor therein would be prohibited and would, in and of itself, cause or result in a default thereunder enabling another person party to such contract, instrument or chattel paper to enforce any remedy with respect thereto or give another person party the right to terminate, accelerate or otherwise adversely alter Grantor's rights, title and interest thereunder; provided, however, that the foregoing exclusion shall not apply if (i) such prohibition has been waived or such other person

has otherwise consented to the creation hereunder of a security interest in such contract, instrument or chattel paper, or (ii) such prohibition would be rendered ineffective pursuant to Sections 9-407(a) or 9-408(a) of the UCC, as applicable and as then in effect in any relevant jurisdiction, or any other applicable law (including the Bankruptcy Code) or principles of equity); provided further that immediately upon the ineffectiveness, lapse or termination of any such provision, the term "Intellectual Property Collateral" shall include, and Grantor shall be deemed to have granted a security interest in, all its rights, title and interests in and to such contract, instrument or chattel paper as if such provision had never been in effect; and provided further that the foregoing exclusion shall in no way be construed so as to limit, impair or otherwise affect Lender's unconditional continuing security interest in and to all rights, title and interests of Grantor in or to any payment obligations or other rights to receive monies due or to become due under any such contract, instrument or chattel paper and in any such monies and other proceeds of such contract, instrument or chattel paper.

Section 3. Loan Agreement and Fourth Amendment. The security interest granted pursuant to this Agreement is granted in conjunction with, and is in no way limiting, the security interest granted to Agent, for the benefit of itself and the Lenders, pursuant to the Loan Agreement and the Fourth Amendment, and Grantor hereby acknowledges and agrees that the rights and remedies of Agent and Lenders with respect to the security interest in the Intellectual Property Collateral made and granted hereby are more fully set forth in the Loan Agreement and the Fourth Amendment, the terms and provisions of each of which are incorporated by reference herein as if fully set forth herein.

Section 4. Grantor Remains Liable. Grantor hereby agrees that, anything herein to the contrary notwithstanding, Grantor shall retain full and complete responsibility for the prosecution, defense, enforcement or any other necessary or desirable actions in connection with their Intellectual Property subject to a security interest hereunder.

Section 5. Counterparts. This Agreement may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement. Signature pages may be detached from multiple separate counterparts and attached to a single counterpart.

Section 6. Governing Law. This Agreement and the rights and obligations of the parties hereto shall be governed by, and construed and interpreted in accordance with, the law of the State of New York.

*[Signature Pages Follow]*

In witness whereof, Grantor has caused this Intellectual Property Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

**GRANTOR:**

**HELICOS BIOSCIENCES  
CORPORATION**

By: 

Name: Ivan Trifunovich

Title: President & Chief Executive Officer

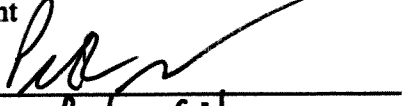
INTELLECTUAL PROPERTY SECURITY AGREEMENT  
SIGNATURE PAGE

TRADEMARK

REEL: 004418 FRAME: 0212

ACCEPTED AND AGREED  
as of the date first above written:

**GENERAL ELECTRIC CAPITAL CORPORATION,**  
as Agent

By:   
Name: Peter Gibson  
Title: Duly Authorized Signatory



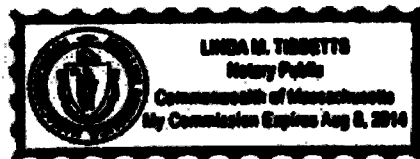
**Acknowledgment of Grantor**

STATE OF Massachusetts

COUNTY OF Middlesex ) ss

On this 12<sup>th</sup> day of November 2010 before me personally appeared Ivan Trifunovich, proved to me on the basis of satisfactory evidence to be the person who executed the foregoing instrument on behalf of Helicos Biosciences Corporation, who being by me duly sworn did depose and say that he is an authorized officer of said corporation, that the said instrument was signed on behalf of said corporation as authorized by its Board of Directors and that he acknowledged said instrument to be the free act and deed of said corporation.

Linda M. Tibbets  
Notary Public



ACKNOWLEDGEMENT OF GRANTOR  
INTELLECTUAL PROPERTY SECURITY AGREEMENT

**Schedule 1  
to  
Intellectual Property Security Agreement**

None.

**Schedule 2  
to  
Intellectual Property Security Agreement**

SCHEDULE 2  
INTELLECTUAL PROPERTY SECURITY AGREEMENT

Trademarks - Schedule 2 to the IP Security Agreement

<u>Mark</u>	<u>Country</u>	<u>Application/Registration</u>	<u>Current Status</u>
VIRTUAL TERMINATOR	Australia	Registration No. 1212374	Registered
HELICOS	Canada	Application No. 1232852	Registered
SMS GRADE	Canada	Application No. 1374061	Allowed
VIRTUAL TERMINATOR	Canada	Application No. 1374056	Allowed
VIRTUAL TERMINATOR	China	Application No. 6409866	Pending
HELICOS	European Union	Registration No. 4046611	Registered
VIRTUAL TERMINATOR	European Union	Application No. 6478432	Opposed
VIRTUAL TERMINATOR	Hong Kong	Registration No. 301003021	Registered
HELICOS	Japan	Registration No. 4906485	Registered
VIRTUAL TERMINATOR	Japan	Registration No. 5272534	Registered
VIRTUAL TERMINATOR	Singapore	Registration No. T0722692J	Registered
VIRTUAL TERMINATOR	Switzerland	Registration No. 570640	Registered
HELICOS	United States	Registration No. 3,648,788	Registered
HELICOS BIOSCIENCES CORPORATION AND DESIGN	United States	Application No. 77/114,088	Registered
HELICOS LOGO	United States	Application No. 77/114,083	Registered
HELISCOPE	United States	Application No. 77/065,289	Registered
SMS GRADE	United States	Application No. 77/193,551	Allowed
SMS GRADE	United States	Application No. 77/193,563	Allowed
VIRTUAL TERMINATOR	United States	Application No. 77/193,460	Allowed
VIRTUAL TERMINATOR	United States	Application No. 77/193,450	Allowed

<b>Mark</b>	<b>Country</b>	<b>Application/Registration</b>	<b>Current Status</b>
SMS GRADE	European Union	Application No. 6478411	Abandoned
VIRTUAL TERMINATOR	India	Application No. 1625788	Abandoned
VIRTUAL TERMINATOR	South Korea	Application No. 40-2007-0061469	Abandoned
MISCELLANEOUS DESIGN	United States	Application No. 78/394,654	Abandoned
MORE STRANDS. BIGGER EXPERIMENTS. BETTER SCIENCE.	United States	Application No. 77/065,291	Abandoned
SMS GRADE	United States	Application No. 77/193,584	Abandoned
SMS GRADE	United States	Application No. 77/193,569	Abandoned
SMS GRADE	United States	Application No. 77/193,577	Abandoned
VIRTUAL TERMINATOR	United States	Application No. 77/193,537	Abandoned
VIRTUAL TERMINATOR	United States	Application No. 77/193,524	Abandoned
VIRTUAL TERMINATOR	United States	Application No. 77/193,504	Abandoned

**Schedule 3  
to  
Intellectual Property Security Agreement**

U.S. Patents – Schedule 3 to the IP Security Agreement

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
002/01US	11/500,165		Signal pattern compositions and methods	Philip Buzby	Abandoned	Helicos
004/01US	09/843,038		CHAIN TERMINATORS, THE USE THEREOF FOR NUCLEIC ACID SEQUENCING AND SYNTHESIS AND A METHOD OF THEIR PREPARATION	Kwiatkowski, Marek	Abandoned	Helicos
006/01US	11/803,339		METHODS AND COMPOSITIONS FOR SEQUENCING A NUCLEIC ACID	KRZYMANSKA-OLEJNIK, EDYTA; SIDDIQI, Suhaib; MARAPPAN, Subramanian; BUZBY, Philip; ROY, ATANU; ORGUEIRA, HERNAN	Abandoned	Helicos
009/02US	10/967,778		Methods and apparatus for analyzing polynucleotide sequences	Quake, Stephen; (San Marino, CA) ; Volkmuth, Wayne; (Calabasas, CA) ; Unger, Marc; (South San Francisco, CA)	Abandoned	California Institute of Technology - licensed to Helicos
009/04US	11/699,216		Methods and apparatus for analyzing polynucleotide sequences	Stephen Quake; Volkmuth, Wayne; Unger, Marc	Abandoned	California Institute of Technology - licensed to Helicos
009/05US	11/928,926		Methods and apparatuses for analyzing polynucleotide sequences	Stephen Quake	Abandoned	California Institute of Technology - licensed to Helicos
010/00US	10/900,711		Use of single-stranded nucleic acid binding proteins in sequencing	Buzby, Philip	Abandoned	Helicos
011/00US	10/831,214		Methods for nucleic acid sequence determination	Buzby, Philip; Ickes, Rebecca Adele; DiMeo, James Joseph	Abandoned	Helicos
011/01US	10/831,214		Methods for nucleic acid sequence determination	Buzby, Philip; Ickes, Rebecca Adele; DiMeo, James Joseph	Abandoned	Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
013/01US	11/928,643		Methods and devices for sequencing nucleic acids	Lapidus, Stanley	Abandoned	Helicos
014/00US	11/184,360		Non-contact detection	Ulmer, Kevin	Abandoned	Helicos
015/01US	11/643,742		Molecules and methods for nucleic acid sequencing	Siddiqi, Suhaib	Abandoned	Helicos
015/02US	11/928,618		Molecules and methods for nucleic acid sequencing	Siddiqi, Suhaib	Abandoned	Helicos
015/00US	11/412,569		Molecules and Methods for Nucleic Acid Sequencing	Siddiqi, Suhaib	Abandoned	Helicos
018/02US	11/499,175		MULTI-CHANNEL FLOW CELLS	Lawson, John; Wellman, Parris; Kiani, Sepehr	Abandoned	Helicos
018/03US	11/728,041		MULTI-CHANNEL FLOW CELLS	Lawson, John; Wellman, Parris; Kiani, Sepehr	Abandoned	Helicos
019/00US	11/303,046		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric G.; Lapidus, Stanley N.	Abandoned	Helicos and Lander
019/01US	11/517,531		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric G.; Lapidus, Stanley N.	Abandoned	Helicos and Lander
019/02US	11/803,053		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric G.; Lapidus, Stanley N.	Abandoned	Helicos and Lander
019/03US	11/929,168		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric G.; Lapidus, Stanley N.	Abandoned	Helicos and Lander
019/04US	12/097023		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric G.; Lapidus, Stanley N.	Abandoned	Helicos and Lander
020/01US	11/347,350		Detecting Apparent Mutations in Nucleic Acid Sequences	Lapidus, Stanley; Weiss, Howard	Abandoned	Helicos
021/01US	11/640,124		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Harris, Timothy; Lander, Eric	Abandoned	Helicos and Lander
021/00US	11/404,675		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric	Abandoned	Lander
022/01US	11/413,381		Stabilizing a Nucleic Acid for Nucleic Acid Sequencing	Buzby, Philip	Abandoned	Helicos



Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
022/02US	11/709,338		Stabilizing a Nucleic Acid for Nucleic Acid Sequencing	Buzby, Philip	Abandoned	Helicos
023/00US	11/345,730		Image Analysis	Tyurina, Anastasia	Abandoned	Helicos
024/01US	11/326,121		METHODS AND COMPOSITIONS FOR CORRECTING MISINCORPORATION IN A NUCLEIC ACID SYNTHESIS REACTION	Buzby, Philip	Abandoned	Helicos
024/02US	11/930,323		METHODS AND COMPOSITIONS FOR CORRECTING MISINCORPORATION IN A NUCLEIC ACID SYNTHESIS REACTION	Buzby, Philip	Abandoned	Helicos
026/00US	11/007,831		STABILIZING A POLYELECTROLYTE MULTILAYER	Lapen, Daniel	Abandoned	Helicos
027/00US	11/528,959		POLYMERASE VARIANTS FOR DNA SEQUENCING	Buzby, Philip	Abandoned	Helicos
028/00US	11/638,257		Buffer Composition	Buzby, Philip	Abandoned	Helicos
030/01US	10/990,167		Apparatus and Methods for Analyzing Samples	Harris, Timothy D.; Ulmer, Kevin	Abandoned	Helicos
031/01US	11/234,420		AN OPTICAL TRAIN AND METHOD FOR TIRF SINGLE MOLECULE DETECTION AND ANALYSIS	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard and Lapidus, Stanley N.	Abandoned	Helicos
031/02US	11/849,088		AN OPTICAL TRAIN AND METHOD FOR TIRF SINGLE MOLECULE DETECTION AND ANALYSIS	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard and Lapidus, Stanley N.	Abandoned	Helicos
031/03US	11/928,715		AN OPTICAL TRAIN AND METHOD FOR TIRF SINGLE MOLECULE DETECTION AND	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard	Abandoned	Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
			ANALYSIS	and Lapidus, Stanley N.		
031/04US	11/928,727		AN OPTICAL TRAIN AND METHOD FOR TIRF SINGLE MOLECULE DETECTION AND ANALYSIS	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard and Lapidus, Stanley N.	Abandoned	Helicos
032/01US	12/043,077		SYSTEMS AND METHODS FOR REDUCING DETECTED INTENSITY NON- UNIFORMITY IN A LASER BEAM	Weber, Aaron; Tracy, David	Abandoned	Helicos
033/00US	11/481,403		OPTICAL APPARATUS AND METHODS FOR CHEMICAL ANALYSIS	Weber, Aaron; Wellman, Parris; and Kepler, John	Abandoned	Helicos
034/00US	11/592,006		METHOD FOR ESTIMATING ERROR FROM A SMALL NUMBER OF EXPRESSION SAMPLES	Thayer, Edward	Abandoned	Helicos
035/01US	09/673,544		NOVEL AND MORE EXPEDIENT METHOD OF DETERMINING THE NUCLEOTIDE SEQUENCE OF OLIGONUCLEOTIDES AND DNA MOLECULES	Hayes, Mark	Abandoned	Arizona Technology Enterprises - licensed to Helicos
044/00US	11/133,675		Methods for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Harris, Timothy	Abandoned	Helicos
048/00US	11/360,859		Methods for Mutation Detection	Efcavitch, J. William; Causey, Marie Sutherlin	Abandoned	Helicos
049/00US	11/286,626		Nucleotide Analogs	Buzby, Philip	Abandoned	Helicos
049/01US	11/289,821		Nucleotide Analogs	Buzby, Philip	Abandoned	Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
049/02US	11/295,406		Nucleotide Analogs	Buzby, Philip	Abandoned	Helicos
049/03US	11/603,945		Methods and Compositions for Sequencing A Nucleic Acid	Siddiqi, Suhaib M.; Buzby, Philip R.; Afeyan, Noubar B. & Liu, David R.	Abandoned	Helicos
051/00US	11/496,274		Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejniak, Edyta; Orgueira, Antonio H. & Bai, Xiaopeng	Abandoned	Helicos
052/00US	11/496,275		Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejniak, Edyta; Orgueira, Antonio H. & Bai, Xiaopeng	Abandoned	Helicos
053/00US	11/496,262		Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejniak, Edyta; Orgueira, Antonio H. & Bai, Xiaopeng	Abandoned	Helicos
053/01US	12/354,437		Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejniak, Edyta; Orgueira, Antonio H. & Bai, Xiaopeng	Abandoned	Helicos
054/00US	90/008152		COMPOSITIONS FOR ENZYME CATALYZED TEMPLATE-INDEPENDENT CREATION OF PHOSPHODIESTER BONDS USING PROTECTED NUCLEOTIDES		Abandoned	Helicos
065/00WO	PCT/US08/86938		SURFACE-CAPTURE OF TARGET NUCLEIC ACIDS	Boyce, John; Harris, Timothy	Abandoned	Helicos
084/00US	12/043,118		LIQUID HANDLING SYSTEM AND METHODS FOR MIXING AND DELIVERING LIQUID REAGENTS	John Price, Parris Wellman, John Kepler, Alexander Watson	Abandoned	Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
086/00US	12/043,033		METHODS AND COMPOSITIONS FOR REDUCING NUCLEOTIDE IMPURITIES	David Z. Xie, Philip R. Buzby, Timothy D. Harris	Abandoned	Helicos
095/00US	12/052,492		SYSTEM AND METHOD FOR ANALYSIS AND PRESENTATION OF GENOMIC DATA	Lapidus, Stanley	Abandoned	Helicos
102/00US	12/043,056		METHODS FOR REDUCING CONTAMINANTS IN NUCLEIC ACID SEQUENCING BY SYNTHESIS	Hazen Babcock, Mirna Jarosz, Jennifer Colonnel, Parris Wellman, Geoff Lowman, Jayson Bowers, John Kepler	Abandoned	Helicos
109/01WO	PCT/US09/039475		NUCLEOTIDE ANALOGS	Suhaib Siddiqi, et al.	Abandoned	Helicos
113/00US	61/044310		METHODS FOR TRANSCRIPT ANALYSIS	Causey, Marie; Raz, Tal Colonell, Jennifer; Buzby, Philp	Abandoned	Helicos
1002/00US	61/111,004		FLOW CELLS AND SYSTEMS AND METHODS USING THEM	Richard Joseph, James DiMeo, Mirna Jarosz, John Thompson	Expired	Helicos
1003/00US	61/111128		METHODS, FLOW CELLS AND SYSTEMS FOR SINGLE CELL ANALYSIS	Thompson, Jarosz, Bowers, Chouinard, Kapranov, Efcavitch, Hart, Oszolak	Expired	
1005/00US	61/114,136		Methods of reducing over representation of fragment ends	Doron Lipson	Expired	
1006/00US	61/114872		METHOD FOR STANDARIZING SURFACE BINDING OF A NUCLEIC ACID SAMPLE FOR SEQUENCING ANALYSIS	Richard Joseph, James DiMeo	Expired	
1007/00US	61/117,291		SIMPLIFIED SAMPLE PREPARTION FOR RNA ANALYSIS	Doron Lipson, Tal Raz, John F. Thompson	Expired	
1008/00US	61/118,676		Single Molecule Protein Screening	Robi Mitra, Lee Tessler, Jeff Reifenger	Expired	Washington University – licensed to Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
1009/00US	61/119,197		COMPETITOR MOLECULES USEFUL FOR LOWERING NONSPECIFIC ADSORPTION OF DYE LABELED NUCLEOTIDES	Philip R. Buzby, Jayson Bowers	Expired	
001/00US	60/585,565		Methods for nucleic acid amplification and sequence determination	LAPIDUS, Stanley; BUZBY, Philip	Expired	Helicos
002/00US	60/705,941		SIGNAL PATTERN COMPOSITIONS AND METHODS	Buzby, Philip	Expired	Helicos
005/00US	60/927,467		METHODS AND COMPOSITIONS FOR SEQUENCING A NUCLEIC ACID	Buzby, Philip	Expired	Helicos
017/00US	60/667,790		Methods for determining a protein	Kahvejian, Avak	Expired	Helicos
018/00US	60/705,847		MULTI-CHANNEL FLOW CELLS	Wellman, Parris	Expired	Helicos
018/01US	60/813,428		DEVICES FOR ANALYZING NUCLEIC ACIDS	Wellman, Parris	Expired	Helicos
020/00US	60/649,879		Detecting Apparent Mutations in Nucleic Acid Sequences	Lapidus, Stanley	Expired	Helicos
024/00US	60/641,388		METHODS AND COMPOSITIONS FOR CORRECTING MISINCORPORATION IN A NUCLEIC ACID SYNTHESIS REACTION	Buzby, Philip	Expired	Helicos
030/00US	60/589,170		APPARATUS AND METHODS FOR HANDLING MICROFLUIDIC VOLUMES		Expired	Helicos
035/00US	60/083,840		NOVEL AND MORE EXPEDIENT METHOD OF DETERMINING THE NUCLEOTIDE SEQUENCE OF OLIGONUCLEOTIDES AND DNA MOLECULES	Williams, Peter; Hayes, Mark A; Rose, Seth D; Bloom, Linda B.; Reha-Krantz, Linda J.; & Pizziconi, Vincent B.	Expired	Arizona Technology Enterprises - licensed to Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
038/00US	60/547,611		Methods and Kits for Analyzing Polynucleotide Sequences	Lapidus, Stanley Quake, Stephen R. Lander, Eric S.	Expired	Helicos, California Institute of Technology, and Lander
039/00US	60/548,704		APPLICATIONS OF SINGLE MOLECULE SEQUENCING	Lapidus, Stanley	Expired	Helicos
041/00US	60/574,389		METHODS AND DEVICES FOR NUCLEIC ACID SEQUENCE DETERMINATION	Quake, Stephen R.	Expired	California Institute of Technology - licensed to Helicos
047/00US	60/703,777		Consecutive Base Single Molecule Sequencing	Harris, Timothy	Expired	Helicos
063/00US	61/034,141		COATED SUBSTRATES EXHIBITING LOW LOSS OF DNA DURING SEQUENCING OPERATIONS AND METHODS OF MAKING THE SAME	Lapen, Daniel	Expired	Helicos
096/01US	61/021,465		STATISTICALLY CORRECTED COUNTING OF SEQUENCING READS FOR QUANTITATIVE GENETIC ANALYSIS	Lipson, Doron	Expired	Helicos
100/00US	61/027,172		METHODS FOR DETERMINING HOMOPOLYMER LENGTH	Giladi, Eldar	Expired	Helicos
1004/00US	61/113,312		Methods of sample encoding for multiplex analysis of samples by SMS	Steinmann, Joseph, Causey, Thompson, Giladi, Thayer	Expired	Helicos
103/00US	61/034,126		METHODS AND DEVICE FOR MIXING REAGENTS	John Kepler, Alexander Watson	Expired	Helicos
104/00US	61/034,140		METHODS AND DEVICES FOR BUBBLE MITIGATION	John Kepler, Alexander Watson	Expired	Helicos
105/00US	61/034,138		HIERARCHICAL CLUSTERING STRAND FORMATION	Doron Lipson	Expired	Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
106/00US	61/034,131		TEMPERATURE CONTROL SYSTEM	Sepehr Kiani; Abhijeet Shinde	Expired	Helicos
108/00US	61/036,326		siRNA METABOLISM ASSAYS	Thompson, John F.	Expired	Helicos
111/00US	61/041,905		METHODS FOR SEQUENCE ALIGNMENT	Giladi, Eldar	Expired	Helicos
112/00US	61/042,460		METHODS FOR TRANSCRIPT ANALYSIS	Causey, Marie; Raz, Tal	Expired	Helicos
115/00US	61/047397		PAIRED-END READS IN SEQUENCING BY SYNTHESIS	Milos, Patrice	Expired	Helicos
115/01US	61/098,910		PAIRED-END READS IN SEQUENCING BY SYNTHESIS	Milos, Patrice; Thompson, John F.; Harris, Timothy	Expired	Helicos
115/02US	61/047393		METHODS FOR NUCLEIC ACID SEQUENCING		Expired	Helicos
117/00US	61/099,389		Methods for sequencing degraded or modified nucleic acids	Thompson, John F.	Expired	Helicos
118/00US	61/103466		Analysis method for detection seq variants based on barcode reads	Lipson, Doron	Expired	Helicos
119/00US	61/108382		METHODS OF SAMPLE PREPARATION FOR NUCLEIC ACID ANALYSIS FOR NUCLEIC ACIDS AVAILABLE IN LIMITED AMOUNTS	William Pierceall, Kathleen Steinmann, Marie Causey, Tal Raz, Mirna Jarosz, Philip Buzby, and John Thompson	Expired	Helicos
120/00US	61/149,918		Direct RNA sequencing	Ozsolak, Fatih	Expired	Helicos
121/00US	61/149,948		On-Surface Tailing	Ozsolak, Fatih	Expired	Helicos
123/00US	61/153,548		Small sample prep	Ozsolak, Fatih	Expired	Helicos
124/00US	61/187,133		DISCOVERY OF NOVEL RNA SPECIES USING NOVEL TRUE SINGLE MOLECULE SEQUENCING METHODS (tSMS)	Kapranov, Philipp	Expired	Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
124/01US	61/299069		DISCOVERY OF NOVEL RNA SPECIES USING NOVEL TRUE SINGLE MOLECULE SEQUENCING METHODS (tSMS)	Kapranov, Philipp	Expired	Helicos
126/00US	61/246,790		POLYMERASES AND METHODS OF USE THEREOF	Efcavitch, J. William; Bowers, Jayson; Buzby, Phil	Expired	Helicos
130/00US	61/110139		SEQUENCING METHODS, SYSTEMS, AND MATERIALS		Expired	Helicos
1001/00US	61/110139			Thompson, John F.	Expired	Helicos
136/00US	08/325224	6087095	DNA SEQUENCING METHOD	ROSENTHAL, André; BRENNER, Sydney	Patented	Roche - licensed to Helicos
003/00US	09/412,171	6309836	Compounds for protecting hydroxyls and methods for their use	Kwiatkowski; Marek	Patented	Helicos
003/01US	09/952,719	6639088	Compounds for protecting hydroxyls and methods for their use	Kwiatkowski; Marek	Patented	Helicos
003/02US	10/694,628	7279563	Compounds for protecting hydroxyls and methods for their use	Kwiatkowski; Marek	Patented	Helicos
004/00US	08/875,243	6255475	Chain terminators, the use thereof for nucleic acid sequencing and synthesis and a method of their preparation	Kwiatkowski; Marek	Patented	Helicos
005/01US	12/114,163	7,767,805	METHODS AND COMPOSITIONS FOR SEQUENCING A NUCLEIC ACID	Buzby, Philip	Patented	Helicos
007/00US	11/804,591	7678894	NUCLEOTIDE ANALOGS	SIDDIQI, Suhaib	Patented	Helicos
009/00US	09/908,830	6911345	Methods and apparatus for analyzing polynucleotide sequences	Quake, Stephen; Volkmuth, Wayne; Unger, Marc	Patented	California Institute of Technology - licensed to Helicos
009/01US	10/845,932	7462449	Methods and apparatuses for analyzing polynucleotide	Quake, Stephen R.	Patented	California Institute of Technology - licensed to



Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
			sequences			Helicos
009/03US	11/002,479	7501245	Methods and apparatuses for analyzing polynucleotide sequences	Quake; Stephen; (Stanford, CA) ; Kartalov; Emil Paskalev; (Pasadena, CA)	Patented	California Institute of Technology - licensed to Helicos
012/00US	11/018,515	7424371	Nucleic acid analysis	Kamentsky, Lee D.	Patented	Helicos
022/00US	11/027,165	7,220,549	Stabilizing a Nucleic Acid for Nucleic Acid Sequencing	Buzby, Philip	Patented	Helicos
025/00US	11/404,695 US2006000404695	7282337	METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING	Harris, Timothy	Patented	Helicos
029/00US	11/640,000	7753095	Storing and Handling Liquid Reagents	Kiani, Sepehr; Kepler, John	Patented	Helicos
030/02US	10/990,242	7276720	Apparatus and Methods for Analyzing Samples	Ulmer, Kevin	Patented	Helicos
030/03US	11/865,653	7593109	Apparatus and Methods for Analyzing Samples	Ulmer, Kevin	Patented	Helicos
032/00US	11/370,605	7397546	SYSTEMS AND METHODS FOR REDUCING DETECTED INTENSITY NON-UNIFORMITY IN A LASER BEAM	Weber, Aaron; Tracy, David	Patented	Helicos
035/02US	09/941,882	6780591	METHOD OF DETERMINING THE NUCLEOTIDE SEQUENCE OF OLIGONUCLEOTIDES AND DNA MOLECULES	Williams	Patented	Arizona Technology Enterprises - licensed to Helicos
035/03US	10/229,997	7037687	Method of determining the nucleotide sequence of oligonucleotides and DNA molecules	Williams, Peter; Hayes, Mark A.; Rose, Seth D.; Bloom, Linda B.; Reha-Krantz, Linda J.; Pizziconi, Vincent B.	Patented	Arizona Technology Enterprises - licensed to Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
035/04US	10/709,436	7,645,596	METHOD OF DETERMINING THE NUCLEOTIDE SEQUENCE OF OLIGONUCLEOTIDES AND DNA MOLECULES	Williams, Peter; Hayes, Mark; Rose, Seth D; Bloom, Linda B.; Reha, Linda J.; & Pizziconi, Vincent B.	Patented	Arizona Technology Enterprises - licensed to Helicos
036/01US	09/707,737	6818395	METHODS AND APPARATUS FOR ANALYZING POLYNUCLEOTIDE SEQUENCES	Quake, Stephen R. Unger, Marc	Patented	California Institute of Technology - licensed to Helicos
037/01US	10/099,459	7297518	Methods and apparatus for analyzing polynucleotide sequences by asynchronous base extension	Quake, Stephen R.	Patented	California Institute of Technology - licensed to Helicos
040/01US	10/852,482	7169560	SHORT CYCLE METHODS FOR SEQUENCING POLYNUCLEOTIDES	Lapidus, Stanley; Buzby, Philip; Harris, Timothy	Patented	Helicos
040/02US	11/588,108	7491498	SHORT CYCLE METHODS FOR SEQUENCING POLYNUCLEOTIDES	Lapidus, Stanley; Buzby, Philip; & Harris, Timothy	Patented	Helicos
041/01US	11/137,928; 2006/0019276 A1	7635562	METHODS AND DEVICES FOR NUCLEIC ACID SEQUENCE DETERMINATION	Harris, Timothy; Buzby, Philip R.; Jarosz, Mirna; DiMeo, James; & Gill, Jaime	Patented	Helicos
043/00US	11/046,448	7482120	Methods and Compositions for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Buzby, Philip	Patented	Helicos
046/00US	11/213,621	7666593	Single Molecule Sequencing of Captured Nucleic Acids	Lapidus, Stanley	Patented	Helicos
050/00US	11/295,155	7476734	Nucleotide Analogs	Liu, David	Patented	Helicos
081/00US	12/058,032		METHOD OF EQUALIZING REPRESENTATION LEVELS OF NUCLEIC ACID TARGETS	Harris, Timothy D.; Boyce, John J.	Patented	Helicos
098/00US	12/025,033	7767400	PAIRED-END READS IN SEQUENCING BY SYNTHESIS	Harris, Timothy	Patented	Helicos

Docket #	Application #	Patent #	Title	Inventors	Status	Ownership
127/00US		6524829	METHOD FOR DNA-OR RNA-SEQUENCING	Seeger, Stefan	Patented	Helicos
		6,114,350			Patented	PerkinElmer LAS, Inc.
		6,197,956			Patented	PerkinElmer LAS, Inc.
		6,204,389			Patented	PerkinElmer LAS, Inc.
		6,224,644			Patented	PerkinElmer LAS, Inc.
		6,437,141			Patented	PerkinElmer LAS, Inc.
		2001-0020098			Patented	PerkinElmer LAS, Inc.
		60/163,742			Patented	California Institute of Technology
		60/275,232			Patented	California Institute of Technology
		60/477,429			Patented	California Institute of Technology
		60/477,426			Patented	California Institute of Technology
		60/526,162			Patented	California Institute of Technology
		11/002,739			Patented	California Institute of Technology
		60/546,277			Patented	California Institute of Technology
		60/702,703			Patented	California Institute of Technology
		60/833,747			Patented	California Institute of Technology

<b>Docket #</b>	<b>Application #</b>	<b>Patent #</b>	<b>Title</b>	<b>Inventors</b>	<b>Status</b>	<b>Ownership</b>
		60/899,173			Patented	California Institute of Technology

**Schedule 4  
to  
Intellectual Property Security Agreement**

SCHEDULE 4  
INTELLECTUAL PROPERTY SECURITY AGREEMENT

**U.S. Patent Applications – Schedule 4 to the IP Security Agreement**

<b>Docket #</b>	<b>Application #</b>	<b>Patent #</b>	<b>Title</b>	<b>Inventors</b>	<b>Ownership</b>
033/01US	11/598,516		OPTICAL APPARATUS AND METHODS FOR CHEMICAL ANALYSIS	Weber, Aaron; Wellman, Parris; and Kepler, John	Helicos
035/06US	12/617,842		METHOD OF DETERMINING THE NUCLEOTIDE SEQUENCE OF OLIGONUCLEOTIDES AND DNA MOLECULES	Williams, Peter; Hayes, Mark; Rose, Seth D; Bloom, Linda B.; Reha, Linda J.; & Pizziconi, Vincent B.	Arizona Technology Enterprises - licensed to Helicos
046/01US	12/708,153		Single Molecule Sequencing of Captured Nucleic Acids	Lapidus, Stanley	Helicos
073/00US	11/964,063		IMPROVED TWO-PRIMER SEQUENCING FOR HIGH-THROUGHPUT EXPRESSION ANALYSIS	Buzby, Philip	Helicos
081/01US	12/871978	7790391	METHOD OF EQUALIZING REPRESENTATION LEVELS OF NUCLEIC ACID TARGETS	Harris, Timothy D.; Boyce, John J.	Helicos
098/01US	12/839,609		PAIRED-END READS IN SEQUENCING BY SYNTHESIS	Harris, Timothy	Helicos
1001/01US	12/609,543		POLYMERASES AND METHODS OF USE THEREOF	Efcavitch, J. William; Bowers, Jason; Buzby, Phil; Thompson, John F.	Helicos
1002/01US	12/612,520		FLOW CELLS AND SYSTEMS AND METHODS USING THEM	Richard Joseph, James DiMeo, Mirna Jarosz, John ThompsonThompson, Jarosz, Bowers, Chouinard, Kapranov, Efcavitch, Hart, Oszolak	Helicos
1006/01US	12/618,251		METHOD FOR STANDARIZING SURFACE BINDING OF A NUCLEIC ACID SAMPLE FOR SEQUENCING ANALYSIS	Richard Joseph, James DiMeo	Helicos

<b>Docket #</b>	<b>Application #</b>	<b>Patent #</b>	<b>Title</b>	<b>Inventors</b>	<b>Ownership</b>
104/01US	12/397,870		METHODS AND DEVICES FOR BUBBLE MITIGATION	John Kepler, Alexander Watson	Helicos
106/01US	12/397,937		TEMPERATURE CONTROL SYSTEM	Sepehr Kiani; Abhijeet Shinde	Helicos
109/01US	12/244698		NUCLEOTIDE ANALOGS	Suhaib Siddiqi, et al.	Helicos
112/01US	12/811,579		METHODS FOR TRANSCRIPT ANALYSIS	Causey, Marie; Raz, Tal	Helicos
114/00US	12/187892		MAX alignment algorithm	Moulton, Keith; Healy, John; Emhoff, John	Helicos
116/00US	12/208150		Multi-scale short read assembly	Hart, Christopher; Giladi, Eldar; Lipson, Doron	Helicos
117/01US	12/586,539		Methods for sequencing degraded or modified nucleic acids	Thompson, John F.	Helicos
125/00US	12/631074		Nucleotide Analogs	Suhaib Siddiqi, et al.	Helicos
129/00US	61/251,966		Amplification-free Digital Gene Expression Profiling from Minute Cell Quantities	Ozsolak, Fatih; Milos, Patrice	Helicos
133/00US	12/709,057		METHODS FOR DETECTING FETAL NUCLEIC ACIDS AND DIAGNOSING FETAL ABNORMALITIES	Lapidus, Stanley;	Helicos
133/01US	12/727,824		METHODS FOR DETECTING FETAL NUCLEIC ACIDS AND DIAGNOSING FETAL ABNORMALITIES	Lapidus, Stanley;	Helicos
021/02US	11/928,695		Methods for Increasing Accuracy of Nucleic Acid Sequencing	Harris, Timothy; Lander, Eric	Helicos and Lander
035/05US	11/929,141		METHOD OF DETERMINING THE NUCLEOTIDE SEQUENCE OF OLIGONUCLEOTIDES AND DNA MOLECULES	Williams, Peter; Hayes, Mark; Rose, Seth D; Bloom, Linda B.; Reha, Linda J.; & Pizziconi, Vincent B.	Arizona Technology Enterprises - licensed to Helicos

Docket #	Application #	Patent #	Title	Inventors	Ownership
006/02US	11/929,084		METHODS AND COMPOSITIONS FOR SEQUENCING A NUCLEIC ACID	KRZYMANSKA-OLEJNIK, EDYTA; SIDDIQI, Subaib; MARAPPAN, Subramanian; BUZBY, Philip; ROY, ATANU; ORGUEIRA, HERNAN	Helicos
008/00US	11/540,617		Method and devices for analyzing small RNA molecules	Kahvejian, Avak	Helicos
009/06US	12/400,593		Methods and apparatuses for analyzing polynucleotide sequences	Stephen Quake	California Institute of Technology - licensed to Helicos
010/02US	11/928,682		Use of Single-Stranded Nucleic Acid Binding Proteins in Sequencing	Buzby, Philip	Helicos
013/00US	10/852,028		Methods and devices for sequencing nucleic acids	Lapidus, Stanley	Helicos
016/00US	11/292,528		Sample preparation method and apparatus for nucleic acid sequencing	Buzby, Philip	Helicos
017/01US	11/396,945		Methods for detecting proteins	Kahvejian, Avak	Helicos
018/06US	12/043,116		SAMPLE LOADING AND RECOVERY	Lawson, John; Wellman, Parris; Kiani, Sepehr	Helicos
025/01US	11/872,436		METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING	Harris, Timothy	Helicos
030/04US	12/563677		Apparatus and Methods for Analyzing Samples	Ulmer, Kevin	Helicos
038/01US	11/054,243		Methods and Kits for Analyzing Polynucleotide Sequences	Quake, Stephen	California Institute of Technology - licensed to Helicos
039/01US	11/067,102		APPLICATIONS OF SINGLE MOLECULE SEQUENCING	Lapidus, Stanley; Quake Stephen	Helicos



Docket #	Application #	Patent #	Title	Inventors	Ownership
040/03US	12/371,310		SHORT CYCLE METHODS FOR SEQUENCING POLYNUCLEOTIDES	Lapidus, Stanley; Buzby, Philip; & Harris, Timothy	Helicos
041/02US	12/618,991		METHODS AND DEVICES FOR NUCLEIC ACID SEQUENCE DETERMINATION	Harris, Timothy; Buzby, Philip R.; Jarosz, Mirna; DiMeo, James; & Gill, Jaime	Helicos
042/01US	10/866,388		FLUORESCENTLY LABELED NUCLEOSIDE TRIPHOSPHATES AND ANALOGS THEREOF FOR SEQUENCING NUCLEIC ACIDS	Quake, Stephen; Buzby, Philip	California Institute of Technology and Helicos
065/00US	11/958,173		SURFACE-CAPTURE OF TARGET NUCLEIC ACIDS	Boyce, John; Harris, Timothy	Helicos
086/01US	12/113501		METHODS AND COMPOSITIONS FOR REDUCING NUCLEOTIDE IMPURITIES	David Z. Xie, Philip R. Buzby, Timothy D. Harris	Helicos
001/01US	11/167,046		METHODS FOR NUCLEIC ACID AMPLIFICATION AND SEQUENCE DETERMINATION	LAPIDUS, Stanley; BUZBY, Philip	Helicos
010/01US	11/843,712		Use of Single-Stranded Nucleic Acid Binding Proteins In Sequencing	Buzby, Philip	Helicos
018/04US	11/928,799		MULTI-CHANNEL FLOW CELLS	Lawson, John; Wellman, Parris; Kiani, Sepehr	Helicos
018/05US	11/997,382		MULTI-CHANNEL FLOW CELLS	Lawson, John; Wellman, Parris; Kiani, Sepehr	Helicos
045/00US	11/286,516		Nucleotide Analogs	Buzby, Philip	Helicos
047/01US	11/496,063		Consecutive Base Single Molecule Sequencing	Harris, Timothy	Helicos
061/00US	11/964,002		TWO-PRIMER SEQUENCING FOR HIGH-THROUGHPUT EXPRESSION ANALYSIS	Nickerson, Elizabeth; Causey, Marie	Helicos

Docket #	Application #	Patent #	Title	Inventors	Ownership
099/01EP	PCT/US2008/052796		SURFACE CHEMISTRY AND DEPOSITION TECHNIQUES	Quake, Stephen R ; Schwartz, Jerrod; Mrksich, Milan	California Institute of Technology, Stanford University, and University of Chicago - licesned to Helicos
099/01US	12/024,584		SURFACE CHEMISTRY AND DEPOSITION TECHNIQUES	Quake, Stephen R ; Schwartz, Jerrod; Mrksich, Milan	California Institute of Technology, Stanford University, and University of Chicago - licesned to Helicos
109/00US	12/098,196		NUCLEOTIDE ANALOGS	J. William Efcavitch, Suhaib Siddiqi, Philip R. Buzby, et al.	Helicos
1005/01US	12/616,883		Methods of reducing over representation of fragment ends	Doron Lipson	Helicos
1007/01US	12/625,115		SIMPLIFIED SAMPLE PREAPARTION FOR RNA ANALYSIS	Doron Lipson, Tal Raz, John F. Thompson	Helicos
1009/01US	12/629,174		COMPETTITOR MOLECULES USEFUL FOR LOWERING NONSPEIFIC ADSORPTION OF DYE LABELED NUCLEOTIDES	Philip R. Buzby, Jayson Bowers	Helicos

**Schedule 5  
to  
Intellectual Property Security Agreement**

SCHEDULE 5  
INTELLECTUAL PROPERTY SECURITY AGREEMENT

US2000 11927391.4

**TRADEMARK**  
**REEL: 004418 FRAME: 0240**

**PCT Patent Applications – Schedule 5 to the IP Security Agreement**

<b>Docket #</b>	<b>Application #</b>	<b>Title</b>	<b>Inventors</b>	<b>Status</b>	<b>Ownership</b>
001/01WO	PCT/US2005/022549	METHODS FOR NUCLEIC ACID AMPLIFICATION AND SEQUENCE DETERMINATION	LAPIDUS, Stanley; BUZBY, Philip	Abandoned	Helicos
006/03WO	PCT/US08/63536	METHODS AND COMPOSITIONS FOR SEQUENCING A NUCLEIC ACID	KRZYMANSKA-OLEJNIK, EDYTA; SIDDIQI, Suhaib; MARAPPAN, Subramanian; BUZBY, Philip; ROY, ATANU; ORGUEIRA, HERNAN	Abandoned	Helicos
009/04WO	PCT/US2005/043804	Methods and Apparatus for Analyzing Polynucleotide Sequences	Quake, Stephen R. and Kartalov, Emil	Abandoned	California Institute of Technology - licensed to Helicos
015/01WO	PCT/US2007/009978	Molecules and Methods for Nucleic Acid Sequencing	Siddiqi, Suhaib	Abandoned	Helicos
015/03WO	PCT/US08/50138	Molecules and Methods for Nucleic Acid Sequencing	Siddiqi, Suhaib	Abandoned	Helicos
019/00WO	PCT/US2006/047739	Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric G.; Lapidus, Stanley N.	Abandoned	Helicos and Lander
021/00WO	PCT/US2007/009207	Methods for Increasing Accuracy of Nucleic Acid Sequencing	Lander, Eric	Abandoned	Lander
023/00WO	PCT/US2007/002871	Image Analysis	Tyurina, Anastasia	Abandoned	Helicos
033/00WO	PCT/US2007/015385	Optical Apparatus and Methods for Chemical Analysis	Weber, Aaron; Wellman, Parris; and Kepler, John	Abandoned	Helicos
051/00WO	PCT/US2007/074828	Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejnik, Edyta; Orgueira, Antonio H. & Bai, Xiaopeng	Abandoned	Helicos
052/00WO	PCT/US2007/074829	Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejnik, Edyta;	Abandoned	Helicos

Docket #	Application #	Title	Inventors	Status	Ownership
			Orgueira, Antonio H. & Bai, Xiaopeng		
053/00EP	PCT/US2007/074831	Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejnik, Edyta; Orgueira, Antonio H. & Bai, Xiaopeng	Abandoned	Helicos
061/01WO	PCT/US08/88139	TWO-PRIMER SEQUENCING FOR HIGH-THROUGHPUT EXPRESSION ANALYSIS	Nickerson, Elizabeth; Causey, Marie	Abandoned	Helicos
063/00WO		COATED SUBSTRATES EXHIBITING LOW LOSS OF DNA DURING SEQUENCING OPERATIONS AND METHODS OF MAKING THE SAME	Lapen, Daniel	Abandoned	Helicos
086/01WO	PCT/US09/35823	METHODS AND COMPOSITIONS FOR REDUCING NUCLEOTIDE IMPURITIES		Abandoned	Helicos
096/01WO	PCT/US09/30952	QUANTITATIVE GENETIC ANALYSIS	Lipson, Doron; Raz, Tal	Abandoned	Helicos
109/00WO	PCT/US08/059446	NUCLEOTIDE ANALOGS	J. William Efcavitch, Suhaib Siddiqi, Philip R. Buzby, et al.	Abandoned	Helicos
1001/00WO	PCT/US09/62732	POLYMERASES AND METHODS OF USE THEREOF	Efcavitch, J. William; Bowers, Jason; Buzby, Phil; Thompson, John F.	Abandoned	Helicos
002/01WO	PCT/US2006/030676	Signal Pattern Compositions and Method	Buzby, Philip	National Phase Applications Filed	Helicos
003/00WO	PCT/SE00/001929	Compounds for Protecting Hydroxyls and Methods for Their Use	Kwiatkowski, Marek	National Phase Applications Filed	Helicos
005/01WO	PCT/US2008/062397	METHODS AND COMPOSITIONS FOR SEQUENCING	Buzby, Philip	National Phase Applications Filed	Helicos

Docket #	Application #	Title	Inventors	Status	Ownership
		A NUCLEIC ACID			
007/00WO	PCT/US2008/063945	NUCLEOTIDE ANALOGS	SIDDIQI, Suhaib	National Phase Applications Filed	Helicos
008/00WO	PCT/US2007/079416	Methods and Devices for Analyzing Small RNA Molecules	Kahvejian, Avak	National Phase Applications Filed	Helicos
012/00WO	PCT/US2005/045920	Nucleic Acid Analysis	Kamentsky, Lee D.	National Phase Applications Filed	Helicos
013/00WO	PCT/US2005/018029	Methods and Devices for Sequencing Nucleic Acids	Lapidus, Stanley	National Phase Applications Filed	Helicos
018/00WO	PCT/US2006/030824	Multi-Channel Flow Cells	Lawson, John; Wellman, Parris; Kiani, Sepehr	National Phase Applications Filed	Helicos
025/00WO	PCT/US2007/09151	METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING	Harris, Timothy	National Phase Applications Filed	Helicos
027/00WO	PCT/US2007/079421	Polymerase Variants For DNA Sequencing	Buzby, Philip	National Phase Applications Filed	Helicos
028/01WO	PCT/US07/86978	Buffer Composition	Buzby, Philip	National Phase Applications Filed	Helicos
029/01WO	PCT/US07/87126	Storing and Handling Liquid Reagents	Kiani, Sepehr; Kepler, John	National Phase Applications Filed	Helicos
030/00WO	US05/024099	Apparatus and Methods for Analyzing Samples in a Light Microscope	Harris, Timothy D.; Ulmer, Kevin	National Phase Applications Filed	Helicos
031/00WO	US05/041264	TIRF Single Molecule Analysis and Method of Sequencing Nucleic Acids	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard and Lapidus, Stanley N.	National Phase Applications Filed	Helicos
032/00WO	PCT/US2007/005876	Systems and Methods for Reducing Detected Intensity Non-Uniformity in a Laser Beam	Weber, Aaron; Tracy, David	National Phase Applications Filed	Helicos
034/00WO	PCT/US2007/083333	A Method for Estimating Error From a Small	Thayer, Edward	National Phase Applications Filed	Helicos

Docket #	Application #	Title	Inventors	Status	Ownership
		Number of Expression Samples			
035/00WO	PCT/US99/09616	Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Hayes, Mark A; Rose, Seth D; Bloom, Linda B.; Reha-Krantz, Linda J.; & Pizziconi, Vincent B.	National Phase Applications Filed	Arizona Technology Enterprises - licensed to Helicos
035/02WO	US02/27605	Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Taylor, Thomas J.; Williams, Daniel J.B.; Gould, Ian; & Hayes, Mark	National Phase Applications Filed	Arizona Technology Enterprises - licensed to Helicos
036/01WO	US00/30591	METHODS AND APPARATUS FOR ANALYZING POLYNUCLEOTIDE SEQUENCES	Quake, Stephen R.	National Phase Applications Filed	California Institute of Technology - licensed to Helicos
037/01WO	US02/08187	Methods and Apparatus for Analyzing Polynucleotide Sequences by Asynchronous Base Extension	Quake, Stephen; Braslavsky, Ido; Herbert, Benedict & Kartalov, Emil	National Phase Applications Filed	California Institute of Technology - licensed to Helicos
038/01WO	US05/04258	Methods and Kits for Analyzing Polynucleotide Sequences	Lapidus, Stanley Quake, Stephen R. Lander, Eric S.	National Phase Applications Filed	Helicos, California Institute of Technology, and Lander
040/00WO	US04/037613	Short Cycle Methods For Sequencing Polynucleotides	Lapidus, Stanley; Buzby, Philip; & Harris, Timothy	National Phase Applications Filed	Helicos
041/01WO	US05/018602	Methods and Devices For Nucleic Acid Sequence Determination	Harris, Timothy; Buzby, Philip R.; Jarosz, Mirna; DiMeo, James; & Gill, Jaime	National Phase Applications Filed	Helicos
043/00WO	PCT/US2006/004638	Methods and Compositions for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Buzby, Philip	National Phase Applications Filed	Helicos
044/00WO	PCT/US2006/019338	Methods for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Harris, Timothy	National Phase Applications Filed	Helicos

Docket #	Application #	Title	Inventors	Status	Ownership
046/00WO	PCT/US2006/033214	Single Molecule Sequencing of Captured Nucleic Acids	Lapidus, Stanley	National Phase Applications Filed	Helicos
047/01WO	PCT/US2006/030245	Consecutive Base Single Molecule Sequencing	Harris, Timothy	National Phase Applications Filed	Helicos
048/00WO	PCT/US2007/004679	Methods for Mutation Detection	Efcavitch, J. William; Causey, Marie Sutherland	National Phase Applications Filed	Helicos
049/03WO	PCT/US2006/045276	Methods and Compositions for Sequencing A Nucleic Acid	Siddiqi, Suhaib M.; Buzby, Philip R.; Afeyan, Noubar B. & Liu, David R.	National Phase Applications Filed	Helicos
053/00WO	PCT/US2007/074831	Nucleotide Analogs	Siddiqi, Suhaib M.; Krzymanska-Olejnik, Edyta; Orgueira, Antonio H. & Bai, Xiaopeng	National Phase Applications Filed	Helicos
073/01WO	PCT/US08/88125	IMPROVED TWO-PRIMER SEQUENCING FOR HIGH-THROUGHPUT EXPRESSION ANALYSIS	Buzby, Philip	National Phase Applications Filed	Helicos
098/00WO	PCT/US09/32970	PAIRED-END READS IN SEQUENCING BY SYNTHESIS	Harris, Timothy	National Phase Applications Filed	Helicos
099/01WO	PCT/US2008/052796	SURFACE CHEMISTRY AND DEPOSITION TECHNIQUES	Quake, Stephen R ; Schwartz, Jerrod; Mrksich, Milan	National Phase Applications Filed	California Institute of Technology - licensed to Helicos
112/01WO	PCT/US09/39477	METHODS FOR TRANSCRIPT ANALYSIS	Causey, Marie; Raz, Tal	National Phase Applications Filed	Helicos
007/01EP	Pub No. 2 160 474		SIDDIQI, Suhaib	Pending	Helicos
1004/01WO	PCT/US09/64001	Methods of sample encoding for multiplex analysis of samples by SMS	Steinmann, Joseph, Causey, Thompson, Giladi, Thayer	Pending	Helicos
114/00WO	PCT/US 09/52718	MAX alignment algorithm	Moulton, Keith; Healy, John; Emhoff, John	Pending	Helicos



Docket #	Application #	Title	Inventors	Status	Ownership
117/01WO	PCT/US09/05287	Methods for sequencing degraded or modified nucleic acids	Thompson, John F.	Pending	Helicos
119/01WO	PCT/US09/61655	METHODS OF SAMPLE PREPARATION FOR NUCLEIC ACID ANALYSIS FOR NUCLEIC ACIDS AVAILABLE IN LIMITED AMOUNTS	William Pierceall, Kathleen Steinmann, Marie Causey, Tal Raz, Mirna Jarosz, Philip Buzby, and John Thompson	Pending	Helicos
123/01WO	PCT/US10/24547	SEQUENCING SMALL QUANTITIES OF NUCLEIC ACIDS	Ozsolak, Fatih	Pending	Helicos
007/01US	12/705,120	NUCLEOTIDE ANALOGS	SIDDIQI, Suhaib	Pending	Helicos
1002/00WO	PCT/US09/63292	FLOW CELLS AND SYSTEMS AND METHODS USING THEM	Richard Joseph, James DiMeo, Mirna Jarosz, John Thompson, Jayson Bowers, Scott Chouinard, Phil Kapranov, Bill Efcavitch, Chris Hart, Fatih Ozsolak	Published/Pending - National Phase Deadline 05/04/2011	Helicos
1008/01WO	PCT/US2009/066236	Single Molecule Protein Screening	Robi Mitra, Lee Tessler, Jeff Reifenberger	Published/Pending National Phase Deadline due 06/01/11	Washington University – licensed to Helicos

**Schedule 6  
to  
Intellectual Property Security Agreement**

SCHEDULE 6  
INTELLECTUAL PROPERTY SECURITY AGREEMENT

Foreign Patents and Patent Applications – Schedule 6 to the IP Security Agreement

Doctd #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
035/02AU	2002-323489		Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Taylor, Thomas J.; Williams, Daniel J.B.; Gould, Ian; & Hayes, Mark	AU	Abandoned	Arizona Technology Enterprises - licensed to Helicos
002/01CA	PCT/US2006/030676		Signal Pattern Compositions and Methods	Buzby, Philip	CA	Abandoned	Helicos
012/00CA	2,591,954		Nucleic Acid Analysis	Kamentsky, Lee D.	CA	Abandoned	Helicos
013/00CA	2,567,822		Methods and Devices for Sequencing Nucleic Acids	Lapidus, Stanley	CA	Abandoned	Helicos
018/00CA	PCT/US2006/030824		Multi-Channel Flow Cells	Lawson, John; Wellman, Parris and Kiani, Sepehr	CA	Abandoned	Helicos
030/00CA	2,574,267		Apparatus and Methods for Analyzing Samples in a Light Microscope	Harris, Timothy D.; Ulmer, Kevin	CA	Abandoned	Helicos
031/00CA	2,588,122		TIRF Single Molecule Analysis and Method of Sequencing Nucleic Acids	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard and Lapidus, Stanley N.	CA	Abandoned	Helicos
035/02CA	2,458,777		Method of Determining the Nucleotide	Williams, Peter; Taylor, Thomas J.; Williams, Daniel	CA	Abandoned	Arizona Technology Enterprises -

**TRADEMARK**

**REEL: 004418 FRAME: 0248**

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
			Sequence of Oligonucleotides and DNA Molecules	J.B.; Gould, Ian; & Hayes, Mark			licensed to Helicos
036/01CA	2,388,528		Methods and Apparatus for Analyzing Polynucleotide Sequences	Quake, Stephen; Volkmoth, Wayne & Unger, Marc	CA	Abandoned	California Institute of Technology - licensed to Helicos
037/01CA	2,440,754		Methods and Apparatus for Analyzing Polynucleotide Sequences by Asynchronous Base Extension	Quake, Stephen; Braslavsky, Ido; Herbert, Benedict & Kartalov, Emil	CA	Abandoned	California Institute of Technology - licensed to Helicos
041/01CA	2,566,806		Methods and Devices For Nucleic Acid Sequence Determination	Harris, Timothy; Buzby, Philip R.; Jarosz, Mirna; DiMeo, James; & Gill, Jaime	CA	Abandoned	Helicos
043/00CA	2,599,477		Methods and Compositions for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Buzby, Philip	CA	Abandoned	Helicos
044/00CA	PCT/US2006/019338		Methods for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Harris, Timothy	CA	Abandoned	Helicos
046/01CA	PCT/US2006/033214		Single Molecule Sequencing of Captured Nucleic Acids	Lapidus, Stanley	CA	Abandoned	Helicos
047/01CA			Consecutive Base Single Molecule Sequencing	Harris, Timothy	CA	Abandoned	Helicos

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
049/03CA	PCT/US2006/045277		Methods and Compositions for Sequencing A Nucleic Acid	Siddiqi, Suhaib M.; Buzby, Philip R.; Afeyan, Noubar B. & Liu, David R.	CA	Abandoned	Helicos
127/00CA	2348548		METHOD FOR DNA- OR RNA- SEQUENCING	Stefan Seeger	CA	Abandoned	Helicos
032/00CN	PCT/US2007/005876		SYSTEMS AND METHODS FOR REDUCING DETECTED INTENSITY NON-UNIFORMITY IN A LASER BEAM	Weber, Aaron; Tracy, David	CN	Abandoned	Helicos
002/01EP	6800858		Signal Pattern Compositions and Methods	Buzby, Philip	EP	Abandoned	Helicos
004/00EP	06902039.5	0808320	Novel Chain Terminators, The Use Thereof For Nucleic Acid Sequencing and a Synthesis and a Method of Their Preparation	Kwiatkowski, Marek	EP	Abandoned	Helicos
012/00EP	5854599.7	EP1828420B1	Nucleic Acid Analysis	Kamentsky, Lee D.	EP	Abandoned	Helicos
013/00EP	05753227.7		Methods and Devices for Sequencing Nucleic Acids	Lapidus, Stanley	EP	Abandoned	Helicos
018/00EP	PCT/US2006/030824		Multi-Channel Flow Cells	Lawson, John; Wellman, Parris and Kiani, Sepehr	EP	Abandoned	Helicos

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
030/00EP	05771601.1		Apparatus and Methods for Analyzing Samples in a Light Microscope	Harris, Timothy D.; Ulmer, Kevin	EP	Abandoned	Helicos
032/00EP	PCT/US2007/005876		SYSTEMS AND METHODS FOR REDUCING DETECTED INTENSITY NON-UNIFORMITY IN A LASER BEAM	Weber, Aaron; Tracy, David	EP	Abandoned	Helicos
035/02EP	02757473.0		Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Taylor, Thomas J.; Williams, Daniel J.B.; Gould, Ian; & Hayes, Mark	EP	Abandoned	Arizona Technology Enterprises - licensed to Helicos
044/00EP	6760138.5		Methods for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Harris, Timothy	EP	Abandoned	Helicos
048/00EP	PCT/US2007/004679		Methods for Mutation Detection	Efcavitch, J. William; Causey, Marie Sutherland	EP	Abandoned	Helicos
116/00WO	PCT/US2008/075872		MULTI-SCALE SHORT READ ASSEMBLY		EP	Abandoned	Helicos
032/00IN	PCT/US2007/005876		SYSTEMS AND METHODS FOR REDUCING DETECTED INTENSITY NON-UNIFORMITY IN A LASER BEAM	Weber, Aaron; Tracy, David	IN	Abandoned	Helicos

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
004/00JP	523466/1996		Novel Chain Terminators, The Use Thereof For Nucleic Acid Sequencing and a Method of Their Preparation	Kwiatkowski, Marek	JP	Abandoned	Helicos
018/00JP	PCT/US2006/030824		Multi-Channel Flow Cells	Lawson, John; Wellman, Parris and Kiani, Sepehr	JP	Abandoned	Helicos
035/02JP	2003-525599		Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Taylor, Thomas J.; Williams, Daniel J.B.; Gould, Ian; & Hayes, Mark	JP	Abandoned	Arizona Technology Enterprises - licensed to Helicos
035/03JP	2004-218570		Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Hayes, Mark; Rose, Seth D; Bloom, Linda B.; Reha, Linda J.; & Pizziconi, Vincent B.	JP	Abandoned	Arizona Technology Enterprises - licensed to Helicos
048/00JP	PCT/US2007/004679		Methods for Mutation Detection	Efcavitch, J. William; Causey, Marie Sutherland	JP	Abandoned	Helicos
003/00NL	00970403.2	1218391	Compounds for Protecting Hydroxyls and Methods for Their Use	Kwiatkowski; Marek	NL	Abandoned	Helicos
032/00SG	PCT/US2007/005876		SYSTEMS AND METHODS FOR REDUCING DETECTED	Weber, Aaron; Tracy, David	SG	Abandoned	Helicos

Doctet #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
			INTENSITY NON-UNIFORMITY IN A LASER BEAM				
003/00CA	2,386,221	14710/01	Function Cleavable Under Reducing Conditions	Kwiatkowski, Marek	AU	Abandoned	California Institute of Technology
035/00CA	2,330,673	2330673	Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Hayes, Mark A; Rose, Seth D; Bloom, Linda B.; Reha-Krantz, Linda J.; & Pizziconi, Vincent B.	CA	Granted	Arizona Technology Enterprises - licensed to Helicos
003/00DE	00970403.2	60034354.5	Function Cleavable Under Reducing Conditions	Kwiatkowski; Marek	DE	Granted	Helicos
127/00DE1	DE19844931		METHOD FOR DNA- OR RNA-SEQUENCING	Seeger, Stefan	DE	Granted	Helicos
127/00DE	99948893	59914751	METHOD FOR DNA- OR RNA-SEQUENCING	Seeger, Stefan	DE	Granted	Helicos
000/00EP	93909381	EP 0 640 146 B1	DNA SEQUENCING METHOD	ROSENTHAL, André; BRENNER, Sydney	EP	Granted	Roche - licensed to Helicos
003/00EP	00970403.2	1218391	Function Cleavable Under Reducing Conditions	Kwiatkowski; Marek	EP	Granted	Helicos
025/00EP	7835726.6		METHODS FOR INCREASING ACCURACY OF	Harris, Timothy	EP	Granted	Helicos



Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
025/01EP			NUCLEIC ACID SEQUENCING				
036/01EP	977016.5	2.008E+09	METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING Methods and Apparatus for Analyzing Polynucleotide Sequences	Harris, Timothy Quake, Stephen; Volkmueth, Wayne & Unger, Marc	EP	Granted	Helicos California Institute of Technology - licensed to Helicos
038/01EP	05722923.9	1716254	Methods and Kits for Analyzing Polynucleotide Sequences	Quake, Stephen	EP	Granted	California Institute of Technology - licensed to Helicos
043/00EP	06734692.4		Methods and Compositions for Improving Fidelity in a Nucleic Acid Synthesis Reaction	Buzby, Philip	EP	Granted	Helicos
127/00EP	99948893	1117831	METHOD FOR DNA- OR RNA- SEQUENCING	Seeger, Stefan	EP	Granted	Helicos
003/00FR	00970403.2	1218391	Function Cleavable Under Reducing Conditions	Kwiatkowski; Marek	FR	Granted	Helicos
127/00FR	99948893	1117831	METHOD FOR DNA- OR RNA- SEQUENCING	Seeger, Stefan	FR	Granted	Helicos
003/00GB	00970403.2	1218391	Function Cleavable Under Reducing Conditions	Kwiatkowski; Marek	GB	Granted	Helicos

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
127/00GB	99948893	1117831	METHOD FOR DNA- OR RNA- SEQUENCING	Seeger, Stefan	GB	Granted	Helicos
035/00JP	2000-547272	3813818	Method of Determining the Nucleotide Sequence of Oligonucleotides and DNA Molecules	Williams, Peter; Hayes, Mark A; Rose, Seth D; Bloom, Linda B.; Reha-Krantz, Linda J.; & Pizziconi, Vincent B.	JP	Granted	Arizona Technology Enterprises - licensed to Helicos
127/00WO	PCT/EP99/07209		METHOD FOR DNA- OR RNA- SEQUENCING	Stefan Seeger	EP	National Phase Applications Filed	Helicos
127/00CH	99948893	AT394504	METHOD FOR DNA- OR RNA- SEQUENCING	Seeger, Stefan	CH	Patented	Helicos
127/00JP	2000-572403	4441699	METHOD FOR DNA- OR RNA- SEQUENCING	Seeger, Stefan	JP	Patented	Helicos
		112254			EP	Patented	PerkinElmer LAS, Inc.
		2,335,240			CA	Patented	PerkinElmer LAS, Inc.
		767368			AU	Patented	PerkinElmer LAS, Inc.
		200043631			AU	Patented	PerkinElmer LAS, Inc.
		2002-542365			JP	Patented	PerkinElmer LAS, Inc.

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
		0640146			EP	Patented	Roche Diagnostics Corporation
		2,133,956			CA	Patented	Roche Diagnostics Corporation
		2001-535610			JP	Patented	California Institute of Technology
		2000063296			WO	Patented	PerkinElmer LAS, Inc.
025/00CA	PCT/US2007/09151		METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING SYSTEMS AND METHODS FOR REDUCING DETECTED INTENSITY NON-UNIFORMITY IN A LASER BEAM	Harris, Timothy	CA	Pending	Helicos
032/00CA	PCT/US2007/005876			Weber, Aaron; Tracy, David	CA	Pending	Helicos
038/01CA	2,557,177		Methods and Kits for Analyzing Polynucleotide Sequences	Quake, Stephen	CA	Pending	California Institute of Technology - licensed to Helicos
040/00CA	2,545,619		Short Cycle Methods For Sequencing Polynucleotides	Lapidus, Stanley; Buzby, Philip; & Harris, Timothy	CA	Pending	Helicos
025/00CN	PCT/US2007/09151		METHODS FOR INCREASING ACCURACY OF	Harris, Timothy	CN	Pending	Helicos

Doct #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
			NUCLEIC ACID SEQUENCING				
127/00CN	99843809		METHOD FOR DNA- OR RNA- SEQUENCING	Seeger, Stefan	CN	Pending	Helicos
008/00EP	PCT/US2007/079416		Methods and Devices for Analyzing Small RNA Molecules	Kahvejian, Avak	EP	Pending	Helicos
031/00EP	05851630.3		TIRF Single Molecule Analysis and Method of Sequencing Nucleic Acids	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard and Lapidus, Stanley N.	EP	Pending	Helicos
037/01EP	02726651.9		Methods and Apparatus for Analyzing Polynucleotide Sequences by Asynchronous Base Extension	Quake, Stephen; Braslavsky, Ido; Herbert, Benedict & Kartalov, Emil	EP	Pending	California Institute of Technology - licensed to Helicos
038/02EP	10 157394.7		Methods and Kits for Analyzing Polynucleotide Sequences	Quake, Stephen	EP	Pending	California Institute of Technology - licensed to Helicos
040/00EP	4810723.9		Short Cycle Methods For Sequencing Polynucleotides	Lapidus, Stanley; Buzby, Philip; & Harris, Timothy	EP	Pending	Helicos
041/01EP	5798447.8		Methods and Devices For Nucleic Acid Sequence	Harris, Timothy; Buzby, Philip R.; Jarosz, Mirna;	EP	Pending	Helicos

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
			Determination	DiMeo, James; & Gill, Jaime			
046/01EP	6789993		Single Molecule Sequencing of Captured Nucleic Acids	Lapidus, Stanley	EP	Pending	Helicos
047/01EP	6800594.1		Consecutive Base Single Molecule Sequencing	Harris, Timothy	EP	Pending	Helicos
049/03EP	PCT/US2006/045278		Methods and Compositions for Sequencing A Nucleic Acid	Siddiqi, Subaib M.; Buzby, Philip R.; Afeyan, Noubar B. & Liu, David R.	EP	Pending	Helicos
098/01EP	9706204.6		PAIRED-END READS IN SEQUENCING BY SYNTHESIS	Harris, Timothy	EP	Pending	Helicos
025/00IN	4180/KOLNP/2008		METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING	Harris, Timothy	IN	Pending	Helicos
108/01US	12/403,597		Methods for Assessing Breakdown Products and Stability of siRNA and other Target Oligonucleotides	Thompson, John F.	IS	Pending	Helicos
003/00JP	2001-528191		Function Cleavable Under Reducing Conditions	Kwiatkowski, Marek	JP	Pending	Helicos

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
013/00JP	2007-515224		Methods and Devices for Sequencing Nucleic Acids	Lapidus, Stanley	JP	Pending	Helicos
025/00JP	2009-505503		METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING Apparatus and Methods for Analyzing Samples in a Light Microscope	Harris, Timothy	JP	Pending	Helicos
030/00JP	2007-522534		Apparatus and Methods for Analyzing Samples in a Light Microscope	Harris, Timothy D.; Ulmer, Kevin	JP	Pending	Helicos
031/00JP	2007-541422		TIRF Single Molecule Analysis and Method of Sequencing Nucleic Acids	Harris, Timothy D.; Buzby, Philip R.; Jarosz, Mirna; Gill, Jaime; Weiss, Howard and Lapidus, Stanley N.	JP	Pending	Helicos
032/00JP	2008-558384		SYSTEMS AND METHODS FOR REDUCING DETECTED INTENSITY NON-UNIFORMITY IN A LASER BEAM	Weber, Aaron; Tracy, David	JP	Pending	Helicos
036/01JP	2003-525599		Method of determining the nucleotide sequence of oligonucleotides and DNA molecules	Quake, Stephen; Volkmoth, Wayne & Unger, Marc	JP	Pending	California Institute of Technology - licensed to Helicos
037/01JP	2002-571942		Methods and Apparatus for Analyzing Polynucleotide	Quake, Stephen; Braslavsky, Ido; Herbert, Benedict & Kartalov, Emil	JP	Pending	California Institute of Technology - licensed to Helicos

Docket #	Application #	Patent #	Title	Inventors	Territory	Status	Ownership
			Sequences by Asynchronous Base Extension				Helicos
041/01JP	2007-515354		Methods and Devices For Nucleic Acid Sequence Determination	Harris, Timothy; Buzby, Philip R.; Jarosz, Mirna; DiMeo, James; & Gill, Jaime	JP	Pending	Helicos
046/01JP	PCT/US2006/033214		Single Molecule Sequencing of Captured Nucleic Acids	Lapidus, Stanley	JP	Pending	Helicos
049/03JP	PCT/US2006/045279		Methods and Compositions for Sequencing A Nucleic Acid	Siddiqi, Subaib M.; Buzby, Philip R.; Afeyan, Noubar B. & Liu, David R.	JP	Pending	Helicos
025/00SG	200807630-9		METHODS FOR INCREASING ACCURACY OF NUCLEIC ACID SEQUENCING	Harris, Timothy	SG	Pending	Helicos