

PATENT ASSIGNMENT

Electronic Version v1.1
 Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	CHANGE OF NAME
CONVEYING PARTY DATA	
Name	Execution Date
454 Corporation	09/17/2003
RECEIVING PARTY DATA	
Name:	454 Life Sciences Corporation
Street Address:	20 Commercial Street
City:	Branford
State/Country:	CONNECTICUT
Postal Code:	06405
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	10767899
CORRESPONDENCE DATA	
Fax Number:	(212)983-3115
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>	
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Correspondent Name:	Mintz Levin Cohn Ferris Glovsky et al.
Address Line 1:	666 Third Avenue-24th Floor
Address Line 4:	New York, NEW YORK 10017
ATTORNEY DOCKET NUMBER:	21465-508001US
NAME OF SUBMITTER:	Michelle A. Iwamoto
Total Attachments: 21 source=21465-508001US-Recordation Form Cover Sheet-Name Change for Assignment#page1.tif source=21465-508001US-Recordation Form Cover Sheet-Name Change for Assignment#page2.tif source=21465-508001US-Recordation Form Cover Sheet-Name Change for Assignment#page3.tif source=21465-508001US-Recordation Form Cover Sheet-Name Change for Assignment#page4.tif source=21465-508001US-Recordation Form Cover Sheet-Name Change for Assignment#page5.tif	

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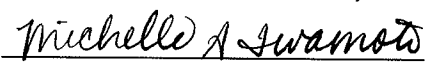
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VIA ELECTRONIC FILING

Date of Filing: October 12, 2010

Attorney Docket No. 21465-508001US

RECORDATION FORM COVER SHEET PATENTS ONLY		
FORM PTO-1595 (Rev. 6-93) OMB No. 0651-0011 (exp. 4/94)	U.S. DEPARTMENT OF COMMERCE Patent and Trademark Office	
Please record the attached original documents or copy thereof.		
1. Name of conveying party(ies): 454 Corporation Additional name(s) of conveying party(ies) attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Execution Date: September 17, 2003	2. Name and address of receiving party(ies) 454 Life Sciences Corporation 20 Commercial Street Branford, Connecticut 06405 Additional name(s) & address(es) attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
3. Nature of conveyance: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Assignment <input type="checkbox"/> Security Agreement <input type="checkbox"/> Other </div> <div> <input type="checkbox"/> Merger <input checked="" type="checkbox"/> Change of Name </div> </div>		
4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application is _____ <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> A. Patent Application No(s): 10/767,899, filed January 28, 2004 </div> <div style="width: 45%;"> B. Patent No(s): </div> </div> <p style="text-align: right;">Additional numbers attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>		
5. Name and address of party to whom correspondence Concerning document should be mailed: Name: Ivor R. Elrifi, Esq. Reg. No. 39,529 Address: MINTZ, LEVIN, COHN, FERRIS GLOVSKY and POPEO, P.C. 666 Third Avenue, 24 th Floor New York, New York 10017 Telephone: (212) 935-3000 Telefax: (212) 983-3115 Customer No. 35437	6. Total number of applications and patents involved: [1] 7. Total fee (37 CFR 3.41) \$40.00 <input checked="" type="checkbox"/> Charge to Deposit Account 50-0311. <input checked="" type="checkbox"/> The Commissioner is authorized to charge Deposit Account No: 50-0311, Reference No. 21465-508001US for any deficiencies.	
DO NOT USE THIS SPACE		
9. Statement and signature <i>To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.</i>		
Michelle A. Iwamoto, Reg. No. 55,296 <hr/> Name of Person Signing	 <hr/> Signature	October 12, 2010 <hr/> Date
Total number of pages including cover sheet: (21)		

Mail documents to be recorded with required cover sheet information to:

MAIL STOP ASSIGNMENT RECORDATION SERVICES
Director of the United States Patent and Trademark Office
P. O. Box 1450; Alexandria, VA 22313-1450

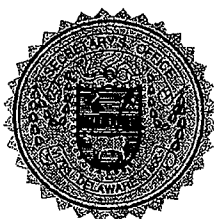
Delaware

PAGE 1

The First State

I, HARRIET SMITH WINDSOR, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE RESTATED CERTIFICATE OF "454 CORPORATION", CHANGING ITS NAME FROM "454 CORPORATION" TO "454 LIFE SCIENCES CORPORATION", FILED IN THIS OFFICE ON THE SEVENTEENTH DAY OF SEPTEMBER, A.D. 2003, AT 4:33 O'CLOCK P.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.



Harriet Smith Windsor

Harriet Smith Windsor, Secretary of State

3195640 8100

030600405

AUTHENTICATION: 2640354

DATE: 09-17-03

PATENT
REEL: 025123 FRAME: 0097

RESTATED CERTIFICATE OF INCORPORATION
OF
454 CORPORATION

(Originally incorporated on March 16, 2000)

FIRST: The name of the Corporation is 454 Life Sciences Corporation (hereinafter sometimes referred to as the "Corporation").

SECOND: The address of the registered office of the Corporation in the State of Delaware is 2711 Centerville Road, Suite 400, in the City of Wilmington, County of New Castle. The name of the registered agent at the address is The Prentice-Hall Corporation System, Inc.

THIRD: (a) The purpose of the Corporation is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of the State of Delaware; provided, however, that the Corporation shall not have the corporate power to take any action, or to cause or permit any Subsidiary or Affiliate to take any action, to exploit in any manner any Corporate Opportunity unless and until exploitation of such Corporate Opportunity is rejected by CuraGen Corporation ("CuraGen"). The Corporation shall not have the corporate power to take any action, or to cause or permit any Subsidiary or Affiliate to (or to own any Subsidiary or Affiliate that does) take any action, to exploit in any manner any Corporate Opportunity, unless and until such Corporate Opportunity shall be presented to CuraGen (on its own behalf and on behalf of its Subsidiaries and Affiliates) and CuraGen determines that CuraGen shall not (on its own behalf or on behalf of its Subsidiaries and Affiliates) pursue such Corporate Opportunity.

(b) If CuraGen or any of its Affiliates or any director or officer of the Corporation who is a director, officer or employee of CuraGen or any of its Affiliates acquires knowledge of a potential transaction or matter which may be a Competitive Opportunity or otherwise is then exploiting any Competitive Opportunity, the Corporation shall have no interest in, and no expectation that, such Competitive Opportunity be offered to it, any such interest or expectation being hereby renounced so that CuraGen, its Affiliates and such individuals (1) shall have no duty to communicate, or present such Competitive Opportunity to the Corporation, shall have the right to hold any such Competitive Opportunity for CuraGen's (and its officers', directors', agents', stockholders', members', partners', Affiliates' or Subsidiaries') own account, or to recommend, assign or otherwise transfer such Competitive Opportunity to persons other than the Corporation or any Subsidiary of the Corporation and (2) cannot be liable to the Corporation or its stockholders for breach of any fiduciary duty as a stockholder, officer or director of the Corporation or otherwise by reason of the fact that CuraGen or any of its Affiliates pursues or acquires such Competitive Opportunity for itself, directs, sells, assigns or otherwise transfers such Competitive Opportunity to another person, or does not communicate information regarding such Competitive Opportunity to the Corporation.

(c) For the purposes of this Article Third:

"Affiliate" of any Person shall mean any other Person that, directly or indirectly, controls, is under common control with or is controlled by that Person. For purposes of this definition, "control" (including, with its correlative meanings, the terms "controlled by" and "under common control with"), as used with respect to any Person, shall mean the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities or by contract or otherwise.

"Competitive Opportunity" shall mean an investment or business opportunity or prospective economic or competitive advantage in which the Corporation could have an interest or expectancy.

"Corporate Opportunity" shall mean an investment, business or development opportunity in which the Corporation could, but for the provisions of this Article Third, have an interest or expectancy; provided, however, that (i) prior to the closing of a Qualified Public Offering (as such term is defined in Section 4(a)(ii) hereof), "Corporate Opportunity" shall not include an investment, business or development opportunity in the 454 Field, and (ii) after the closing of a Qualified Public Offering, "Corporate Opportunity" shall only include an investment, business or development opportunity in the CuraGen Field.

"CuraGen Field" means drug development and the sale of information and/or services associated with drug development for human therapeutics.

"454 Field" means (a) the design, development, manufacture, production, testing and sale of instrumentation, reagents and software for DNA sequencing and DNA-based analysis, and the aggregation of data obtained from third parties through the use of such instrumentation, to create either an internet portal or database for the sole purpose of generating sales of additional instrumentation and sales of reagents and software for DNA-based analysis and (b) the providing of sequencing services for any and all uses outside of the CuraGen Field.

"Person" shall mean an individual, corporation, partnership, limited liability company, trust, unincorporated organization, or other legal entity, or a governmental body, or their equivalent under the applicable legal system.

"Subsidiary" means, with respect to any Person, any corporation, limited liability company, partnership, association, joint venture or other business entity of which (i) if a corporation, (x) ten percent (10%) or more of the total voting power of shares of stock entitled to vote in the election of directors thereof or (y) ten percent (10%) or more of the value of the equity interests is at the time owned or controlled, directly or indirectly, by the Person or one or more of its other Subsidiaries, or (ii) if a limited liability company, partnership, association or other business entity, ten percent (10%) or more of the partnership or other similar ownership interests thereof is at the time owned or controlled,

directly or indirectly, by the Person or one or more of its subsidiaries. The Person shall be deemed to have a ten percent (10%) or greater ownership interest in a limited liability company, partnership, association or other business entity if the Person is allocated ten percent (10%) or more of the limited liability company, partnership, association or other business entity gains or losses or shall be or control the Person managing such limited liability company, partnership, association or other business entity.

FOURTH: The total number of shares of stock which the Corporation shall have authority to issue is eighty-six million (86,000,000) shares, consisting of a class of thirty-eight million (38,000,000) shares of Preferred Stock, par value of one cent (\$0.01) per share (the "Preferred Stock") and a class of forty-eight million (48,000,000) shares of Common Stock, par value of one cent (\$0.01) per share (the "Common Stock").

The Preferred Stock authorized by this Restated Certificate of Incorporation shall be issued in series. The first such series shall be designated Series A Convertible Preferred Stock ("Series A Preferred Stock") and shall consist of twelve million (12,000,000) shares. The second such series shall be designated Series B Preferred Stock ("Series B Preferred Stock") and shall consist of eight million (8,000,000) shares. The third such series shall be designated Series C Preferred Stock ("Series C Preferred Stock") and shall consist of six million four hundred four thousand eight hundred fifty-four (6,404,854) shares. The fourth such series shall be designated Series D Preferred Stock ("Series D Preferred Stock") and shall consist of one million five hundred ninety-five thousand one hundred forty-six (1,595,146) shares. The Series A Preferred Stock, the Series B Preferred Stock, the Series C Preferred Stock and the Series D Preferred Stock are sometimes collectively referred to herein as the "Series Preferred Stock."

Except for the Series Preferred Stock, and except as limited by Article FOURTH, Section 6 hereof, the Board of Directors is authorized at any time, and from time to time, to provide for the issuance of shares of Preferred Stock in one or more series, and to determine the designations, preferences, limitations and relative or other rights of the Preferred Stock or any series thereof. For each series other than the Series Preferred Stock, and except as limited by Article FOURTH, Section 6 hereof, the Board of Directors shall determine, by resolution or resolutions adopted prior to the issuance of any shares thereof, the designations, powers, preferences, limitations and relative or other rights thereof, including but not limited to the following relative rights and preferences, as to which there may be variations among different series:

- (a) The rate and manner of payment of dividends, if any;
- (b) Whether shares may be redeemed and, if so, the redemption price and the terms and conditions of redemption;
- (c) The amount payable for shares in the event of liquidation, dissolution or other winding up of the Corporation;
- (d) Sinking fund provisions, if any, for the redemption or purchase of shares;

(e) The terms and conditions, if any, on which shares may be converted or exchanged;

(f) Voting rights, if any; and

(g) Any other rights and preferences of such shares, to the full extent now or hereafter permitted by the General Corporation Law of the State of Delaware.

The Board of Directors shall have the authority to determine the number of shares that will comprise each series, other than the Series Preferred Stock.

Prior to the issuance of any shares of a series, but after adoption by the Board of Directors of the resolutions establishing such series, the appropriate officers of the Corporation shall file such documents with the State of Delaware as may be required by law.

The relative rights, preferences, privileges, restrictions and other matters relating to the respective classes of the capital stock of the Corporation or the holders thereof are as follows:

1. Definitions.

For purposes of this Article "Junior Shares" shall mean all Common Stock and any other shares of the Corporation other than the Series Preferred Stock.

2. Dividend Rights of Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock and Series D Preferred Stock.

Dividends shall accrue from day to day on each share of the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock and Series D Preferred Stock from the date of original issuance of such share, whether or not funds are legally available therefor and whether or not earned or declared by the Board of Directors, at the rate per annum of \$0.125 per share of Series A Preferred Stock, \$0.125 per share of Series B Preferred Stock, \$0.125 per share of Series C Preferred Stock and \$0.125 per share of Series D Preferred Stock (as adjusted for any stock dividends, stock splits, recapitalizations, consolidations or the like occurring after September 18, 2003, with respect to the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock), payable only upon the liquidation, dissolution or winding up of the Corporation within the meaning of Section 3 hereof. The right to such dividends on the Series Preferred Stock shall be cumulative. Each share of Series Preferred Stock shall rank on a parity with each other share of Series Preferred Stock, irrespective of series, with respect to dividends at the respective rates fixed for such series and no dividends shall be declared as paid or set apart for payment on the Series Preferred Stock unless at the same time a dividend bearing the same proportion to the applicable dividend rate shall also be declared or paid or set apart for payment, as the case may be, on the Series Preferred Stock of each other series then outstanding. No dividends shall be paid on any Junior Shares unless (i) the stated dividend provided for in the first sentence of this paragraph shall theretofore have been declared and paid in full on all shares of Series Preferred Stock then outstanding, and (ii) a dividend equal to the dividend declared on such Junior Shares is paid with respect to all outstanding shares of

Series Preferred Stock in an amount for each such share of Series Preferred Stock equal to the aggregate amount of such dividends for all Junior Shares into which each such share of Series Preferred Stock could then be converted.

At the time of any conversion of any shares of Series Preferred Stock pursuant to Paragraph 4 of this Article FOURTH, any dividend accrued but unpaid pursuant to the preceding paragraph on such Series Preferred Stock shall not be paid by the Corporation and shall be deemed forfeited as of the effective date of such conversion.

3. Liquidation Preference.

(a) In the event of any liquidation, dissolution or winding up of the Corporation, either voluntary or involuntary, the holders of the Series Preferred Stock shall be entitled to receive an amount from assets and surplus funds, prior and in preference to any distribution from the assets or surplus funds of the Corporation to the holders of the Junior Shares, by reason of their ownership thereof. In the case of the Series A Preferred Stock, subject to the liquidation rights and preferences of any class or series of capital stock of the Company designated to be senior to, or on a parity with, the Series A Preferred Stock, such amount shall equal \$2.50 (adjusted for stock splits, stock dividends and other capital transactions occurring after September 18, 2003) for each share of Series A Preferred Stock (the "Series A Liquidation Amount") then held by such holders of Series A Preferred Stock, and, in addition, an amount equal to all accrued but unpaid dividends on the Series A Preferred Stock as provided in Paragraph 2 above. In the case of the Series B Preferred Stock, subject to the liquidation rights and preferences of any class or series of capital stock of the Company designated to be senior to, or on a parity with, the Series B Preferred Stock, such amount shall equal \$2.50 (adjusted for stock splits, stock dividends and other capital transactions occurring after September 18, 2003) for each share of Series B Preferred Stock (the "Series B Liquidation Amount") then held by such holders of Series B Preferred Stock, and, in addition, an amount equal to all accrued but unpaid dividends on the Series B Preferred Stock as provided in Paragraph 2 above. In the case of the Series C Preferred Stock, subject to the liquidation rights and preferences of any class or series of capital stock of the Company designated to be senior to, or on a parity with, the Series C Preferred Stock, such amount shall equal \$2.50 (adjusted for stock splits, stock dividends and other capital transactions occurring after September 18, 2003) for each share of Series C Preferred Stock (the "Series C Liquidation Amount") then held by such holders of Series C Preferred Stock, and, in addition, an amount equal to all accrued but unpaid dividends on the Series C Preferred Stock as provided in Paragraph 2 above. In the case of the Series D Preferred Stock, subject to the liquidation rights and preferences of any class or series of capital stock of the Company designated to be senior to, or on a parity with, the Series D Preferred Stock, such amount shall equal \$2.50 (adjusted for stock splits, stock dividends and other capital transactions occurring after September 18, 2003) for each share of Series D Preferred Stock (the "Series D Liquidation Amount," and together with the Series A Liquidation Amount, the Series B Liquidation Amount and the Series C Liquidation Amount, the "Series Liquidation Amount") then held by such holders of Series D Preferred Stock, and, in addition, an amount equal to all accrued but unpaid dividends on the Series D Preferred Stock as provided in Paragraph 2 above. If, upon the occurrence of such event, the assets and funds thus distributed among the holders of the Series Preferred Stock shall be insufficient to permit the payment to such holders of the full

preferential amount aforesaid, then the entire assets and funds of the Corporation legally available for distribution shall be distributed ratably among the holders of the Series Preferred Stock in proportion to the amount of Series Preferred Stock held by each holder subject to the liquidation rights and preferences of any class or series of capital stock of the Company designated to be senior to, or on a parity with, the Series Preferred Stock. After payment has been made to the holders of the Series Preferred Stock of the full amounts to which they shall be entitled as aforesaid, all remaining assets and funds of the Corporation shall be distributed in like amounts per share on an as-converted basis among the holders of the Series Preferred Stock and the Junior Shares.

4. Conversion. The holders of the Series Preferred Stock shall have conversion rights as follows (the "Conversion Rights"):

(a) Right to Convert.

(i) Each share of Series Preferred Stock shall be convertible, at the option of the holder thereof, at any time after the date of issuance of such share, at the office of the Corporation or any transfer agent for the Series Preferred Stock, into fully paid and nonassessable shares of Common Stock at the applicable Conversion Rate (as hereinafter defined) in effect at the time of conversion. The number of shares of Common Stock into which each share of Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock may be converted is hereinafter referred to as the "Series A Conversion Rate," the "Series B Conversion Rate," the "Series C Conversion Rate" and the "Series D Conversion Rate," respectively, and the Series A Conversion Rate, the Series B Conversion Rate, the Series C Conversion Rate and the Series D Conversion Rate are hereinafter referred to collectively as the "Conversion Rates." The initial Conversion Rate for the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock and Series D Preferred Stock shall each be one (1), and such Conversion Rates shall be subject to the adjustments described below. Any adjustment of the Conversion Rate for any series of Preferred Stock shall also cause an appropriate adjustment of the Conversion Price (as hereinafter defined) for such series of Preferred Stock. The amount obtained by dividing \$2.50 (adjusted for stock splits of and stock dividends on the Series A Preferred Stock) by the Series A Conversion Rate shall be called the "Series A Conversion Price," the amount obtained by dividing \$2.50 (adjusted for stock splits of and stock dividends on the Series B Preferred Stock) by the Series B Conversion Rate shall be called the "Series B Conversion Price," the amount obtained by dividing by \$2.50 (adjusted for stock splits on and stock dividends of the Series C Preferred Stock) by the Series C Conversion Rate shall be called the "Series C Conversion Price," the amount obtained by dividing by \$2.50 (adjusted for stock splits of and stock dividends on the Series D Preferred Stock) by the Series D Conversion Rate shall be called the "Series D Conversion Price" and the Series A Conversion Price, the Series B Conversion Price, the Series C Conversion Price and Series D Conversion Price are herein referred to collectively as the "Conversion Price."

(ii) Each share of Series B Preferred Stock and Series D Preferred Stock shall automatically be converted into shares of Common Stock at the then effective Series B Conversion Rate or Series D Conversion Rate, as the case may be, in the event of (a) the conversion of seventy-five percent (75%) of all outstanding Series B Preferred Stock and Series D Preferred Stock, taken

as a whole, into Common Stock, effective upon such conversion, or (b) the closing of a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (or any successor statute for registration of shares in public offerings) covering the offer and sale of Common Stock for the account of the Corporation to the public (other than a registration statement with respect to employee stock option or purchase plans) resulting in the aggregate receipt by the Corporation of at least thirty million dollars (\$30,000,000) of gross proceeds (before applicable discounts, commissions and expenses) and the listing of the Common Stock on a nationally recognized stock market or exchange, including the Nasdaq Stock Market, the New York Stock Exchange and the American Stock Exchange (a "Qualified Public Offering"). In the event of such an offering, the person(s) entitled to receive the Common Stock issuable upon such conversion of the Series B Preferred Stock and Series D Preferred Stock shall not be deemed to have converted such Series B Preferred Stock and Series D Preferred Stock until immediately prior to the closing of such sale of securities.

(iii) No fractional shares of Common Stock shall be issued upon conversion of the Series Preferred Stock. In lieu of any fractional shares to which the holder would otherwise be entitled, the Corporation shall pay cash equal to the product of such fraction multiplied by the fair market value of one share of Series Preferred Stock, as reasonably determined by the Corporation's Board of Directors, payable as promptly as possible.

(b) Mechanics of Conversion. Before any holder of Series Preferred Stock shall be entitled to convert the same into shares of Common Stock, the holder shall surrender the certificate or certificates therefor, duly endorsed, at the principal office of the Corporation or of any transfer agent for the Series Preferred Stock, and shall give written notice to the Corporation at such office that such holder elects to convert the same and shall state therein the name or names in which such holder wishes the certificate or certificates for shares of Common Stock to be issued. The Corporation shall, as soon as practicable thereafter, issue and deliver at such office to such holder of Series Preferred Stock, or to such holder's nominee or nominees, a certificate or certificates for the number of shares of Common Stock to which such holder shall be entitled as aforesaid. Such conversion shall be deemed to have been made immediately prior to the close of business on the date of such surrender of the shares of Series Preferred Stock to be converted, and the person or persons entitled to receive the shares of Common Stock issuable upon such conversion shall be treated for all purposes as the record holder or holders of such shares of Common Stock as of such date and time.

(c) Adjustment for Combinations or Consolidations; Reorganizations, Reclassification, Exchange and Substitution. Any recapitalization, reorganization, reclassification, consolidation, merger, sale of all or substantially all of the Corporation's assets to any entity or other transaction which is effected in such a manner that holders of Common Stock are entitled to receive (either directly or upon subsequent liquidation) stock, securities or assets with respect to or in exchange for Common Stock is referred to herein as an "Organic Change." Prior to the consummation of any Organic Change, the Corporation shall make appropriate provisions to insure that each of the holders of Series Preferred Stock shall thereafter have the right to acquire and receive, in lieu of or in addition to (as the case may be) the shares of Common Stock immediately theretofore acquirable and receivable upon the conversion of such holder's Series Preferred Stock, such shares of stock, securities or assets as such holder would

have received in connection with such Organic Change if such holder had converted its Series Preferred Stock into shares of Common Stock immediately prior to such Organic Change. In each such case, the Corporation shall also make appropriate provisions to insure that the provisions of this Section 4 shall thereafter be applicable to the Series Preferred Stock and to the shares of stock, securities or assets received by each holder upon such Organic Change.

(d) Adjustment for Dividends, Distributions and Common Stock Equivalents. If the Corporation at any time or from time to time after September 18, 2003 (hereinafter referred to as the "Original Issue Date") shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive a dividend or other distribution to be made only to such holders of Common Stock, but not to the Series Preferred Stock, payable in additional shares of Common Stock, or other securities or rights convertible into or entitling the holder thereof to receive additional shares of Common Stock, directly or indirectly (hereinafter referred to as "Common Stock Equivalents"), without payment of any consideration by such holder for such Common Stock, then and in each such event the maximum number of shares (as set forth in the instrument relating thereto without regard to any provisions contained therein for a subsequent adjustment of such number) of Common Stock issuable in payment of such dividend or distribution or upon conversion or exercise of such Common Stock Equivalents shall be deemed to be issued and outstanding as of the time of such issuance or, in the event such a record date shall have been fixed, as of the close of business on such record date. In each such event each respective Conversion Rate shall be increased as of the time of such issuance or, in the event such a record date shall have been fixed, as of the close of business on such record date, by multiplying such Conversion Rate by a fraction,

(i) the numerator of which shall be the sum of (x) the total number of shares of Common Stock issued and outstanding (before conversion of any then outstanding shares of Preferred Stock and excluding Common Stock issuable upon exchange or conversion or exercise of outstanding Common Stock Equivalents) immediately prior to the time of such issuance or the close of business on such record date plus (y) the number of shares of Common Stock issuable in payment of such dividend or distribution or upon conversion or exercise of such Common Stock Equivalents; and

(ii) the denominator of which shall be the total number of shares of Common Stock issued and outstanding (before conversion of any then outstanding shares of Preferred Stock and excluding Common Stock issuable upon exchange or conversion or exercise of outstanding Common Stock Equivalents) immediately prior to the time of such issuance or the close of business on such record date;

provided, however, that (A) if such record date shall have been fixed and such dividend is not fully paid or if such distribution is not fully made on the date fixed therefor, each Conversion Rate computed upon the original issuance thereof (or upon the occurrence of a record date with respect thereto), and any subsequent adjustments based thereon, shall be recomputed accordingly as of the close of business on such record date, and thereafter each Conversion Rate shall be adjusted pursuant to this Paragraph 4(d) as of the time of actual payment of such dividends or distributions; (B) if such Common Stock Equivalents provide, with the passage of time or otherwise, for any decrease in the number of shares of Common Stock issuable upon conversion

or exercise thereof (or upon the occurrence of a record date with respect thereto), each Conversion Rate computed upon the original issuance thereof (or upon the occurrence of a record date with respect thereto) and any subsequent adjustments based thereon, shall, upon any such decrease becoming effective, be recomputed to reflect such decrease insofar as it affects the rights of conversion or exercise of the Common Stock Equivalents then outstanding; (C) upon the expiration of any rights or conversion or exercise under any unexercised Common Stock Equivalents, each Conversion Rate computed upon the original issuance thereof (or upon the occurrence of a record date with respect thereto), and any subsequent adjustments based thereon, shall, upon such expiration, be recomputed as if the only additional shares of Common Stock issued were the shares of such stock, if any, actually issued upon the conversion or exercise of such Common Stock Equivalents; and (D) in the case of Common Stock Equivalents which expire by their terms not more than sixty (60) days after the date of issuance thereof, no adjustment in any Conversion Rate shall be made until the expiration or exercise of all such Common Stock Equivalents, whereupon such adjustments shall be made in the manner provided in clause (C) above.

(e) Adjustment of Series A Conversion Rate, Series B Conversion Rate, Series C Conversion Rate and Series D Conversion Rate for Diluting Issues. The Series A Conversion Rate, the Series B Conversion Rate, the Series C Conversion Rate and the Series D Conversion Rate shall be subject to the following adjustment, in addition to those set forth above. Except as otherwise provided in this subparagraph (e), in the event the Corporation sells or issues any Common Stock or Common Stock Equivalents at a per share consideration (as defined below) less than the applicable Conversion Price for a series of Preferred Stock, then the Conversion Rate and Conversion Price then in effect shall be adjusted as provided in subparagraphs (i), (ii) and (iii) hereof. For the purposes of the foregoing, the per share consideration with respect to the sale or issuance of Common Stock shall be the price per share received by the Corporation, prior to the payment of any expenses, commissions, discounts and other applicable costs. With respect to the sale or issuance of Common Stock Equivalents which are convertible into or exchangeable for Common Stock without further consideration, the per share consideration shall be determined by dividing the maximum number of shares of Common Stock issuable with respect to such Common Stock Equivalents (as set forth in the instrument relating thereto without regard to any provisions contained therein for subsequent adjustment of such number) into the aggregate consideration received by the Corporation upon the sale or issuance of such Common Stock Equivalents. With respect to the issuance of other Common Stock Equivalents, the per share consideration shall be determined by dividing the maximum number of shares of Common Stock issuable with respect to such Common Stock Equivalents into the total aggregate consideration received by the Corporation upon the sale or issuance of such Common Stock Equivalents plus the minimum aggregate amount of additional consideration receivable by the Corporation upon the conversion or exercise of such Common Stock Equivalents. The issuance of Common Stock or Common Stock Equivalents for no consideration shall be deemed to be an issuance at a per share consideration of \$.00. In connection with the sale or issuance of Common Stock and/or Common Stock Equivalents for non-cash consideration, the fair market value of such consideration shall be determined by the Board of Directors of the Corporation.

As used herein, "Additional Shares of Common Stock" shall mean either shares of Common Stock issued subsequent to the Original Issue Date or, with respect to the issuance of

Common Stock Equivalents, the maximum number of shares of Common Stock issuable in exchange for, upon conversion of, or upon exercise of such Common Stock Equivalents issued subsequent to the Original Issue Date.

The Conversion Prices and the Conversion Rates shall be determined and adjusted once only with respect to any single offering of the Corporation's securities for financing purposes, provided that all closings with respect to any such offering occur within a period of no more than 120 days and, provided further, that an appropriate adjustment shall be made for the benefit of any holder of Series Preferred Stock who converts Series Preferred Stock into Common Stock during such 120 day period.

(i) Upon each issuance of Additional Shares of Common Stock for a per share consideration less than the Series A Conversion Price, Series B Conversion Price, Series C Conversion Price or Series D Conversion Price, as the case may be, in effect on the date of such issuance, the Conversion Rate of such series of Preferred Stock in effect on such date will be adjusted by dividing it by a fraction:

(x) the numerator of which shall be the sum of (a) the total outstanding shares of Common Stock immediately prior to the issuance of such Additional Shares of Common Stock plus the total shares of Common Stock issuable upon conversion of convertible securities and exercise of outstanding options and warrants, plus (b) the number of shares of Common Stock which the aggregate gross consideration received by the Corporation for the total number of such Additional Shares of Common Stock so issued would purchase at the Conversion Price for such series of Preferred Stock; which is in effect immediately prior to such issuance; and

(y) the denominator of which shall be the total outstanding shares of Common Stock immediately after the issuance of such Additional Shares of Common Stock plus the total shares of Common Stock issuable upon conversion of convertible securities and exercise of outstanding options and warrants.

(ii) Upon each issuance of Common Stock Equivalents exchangeable without further consideration into Common Stock for a per share consideration less than the Series A Conversion Price, Series B Conversion Price, Series C Conversion Price or Series D Conversion Price in effect on the date of such issuance, the Conversion Rate of such series of Preferred Stock in effect on such date will be adjusted as in subparagraph (i) above on the basis that the related Additional Shares of Common Stock are to be treated as having been issued on the date of issuance of the Common Stock Equivalents, and the aggregate consideration received by the Corporation for such Common Stock Equivalents shall be deemed to have been received for such Additional Shares of Common Stock.

(iii) Upon each issuance of Common Stock Equivalents other than those described in subparagraph (ii) above, for a per share consideration less than the respective Conversion Price in effect on the date of such issuance, the Conversion Rate of such series of Preferred Stock in effect on such date will be adjusted as in subparagraph (i) above on the basis that the related Additional Shares of Common Stock are to be treated

as having been issued on the date of issuance of such Common Stock Equivalents, and the aggregate consideration received and the minimum amount receivable by the Corporation on conversion or exercise of such Common Stock Equivalents shall be deemed to have been received for such Additional Shares.

(iv) Once any Additional Shares of Common Stock have been treated as having been issued for the purpose of this subparagraph 4(e), they shall be treated as issued and outstanding shares of Common Stock whenever any subsequent calculations must be made pursuant hereto; provided that on the expiration of any options, warrants or rights to purchase Additional Shares of Common Stock or the termination of any rights to convert or exchange for Additional Shares of Common Stock on account of which an adjustment in a Conversion Rate has been made previously pursuant to this subparagraph 4(e), such Conversion Rate shall forthwith be readjusted to such Conversion Rate as would have been obtained had the adjustment made upon the issuance of such options, warrants, rights, or convertible or exchangeable securities been made upon the basis of the issuance of only the number of shares of Common Stock actually issued upon the exercise of such options, warrants or rights, or upon the conversion or exchange of such securities.

(v) The foregoing notwithstanding, no adjustment of the Conversion Rates or Conversion Prices shall be made as a result of the issuance of:

(a) an aggregate amount of not more than 4,952,667 (as adjusted for any stock dividends, stock splits, recapitalizations, consolidations or the like) shares of Common Stock (or any options, warrants or rights to purchase such shares of Common Stock) issued or issuable to employees, officers, directors or consultants of the Corporation with the approval of the Board of Directors of the Corporation pursuant to any stock option plan, stock incentive or purchase plan or agreement approved by the Board of Directors of the Corporation;

(b) any shares of Common Stock pursuant to which any Conversion Rate or Conversion Price is adjusted under subparagraphs (c) or (d) of this Paragraph 4;

(c) any shares of Common Stock issued pursuant to the exchange, conversion, or exercise of any Common Stock Equivalents according to their terms which have previously been incorporated into computations hereunder on the date when such Common Stock Equivalents were issued;

(d) any shares of Common Stock issued upon conversion of the Series Preferred Stock;

(e) securities issued solely in consideration for the acquisition (whether by merger or otherwise) by the Corporation for all or substantially all of the capital stock or assets of any other entity or business organization, or securities issued solely in consideration for the grant by or to the Corporation of

marketing rights, distribution rights, license rights or similar rights granted by or to the Corporation in consideration of the exchange of proprietary technology, whether of the Corporation or any other entity, provided the issuance of such securities is approved by a majority of the members of the Board of Directors;

(f) shares of Common Stock issued or issuable to equipment leasing companies in connection with any equipment leasing arrangement to which the Corporation is a party or to an entity in connection with any leasing arrangement in which the Corporation rents or leases real property; or

(g) shares of Common Stock issued or issuable to banks and other financial institutions in connection with any financing arrangements to which the Corporation is a party which have been approved by a majority of the members of the Board of Directors.

(f) No Adjustment. No adjustment in a Conversion Rate or Conversion Price need be made if such adjustment would result in a change in the Conversion Price of less than \$.01. Any adjustment of less than \$.01 which is not made shall be carried forward and shall be made at the time of and together with any subsequent adjustment which, on a cumulative basis, amounts to an adjustment of \$.01 or more in a Conversion Price.

(g) Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of a Conversion Rate pursuant to this Paragraph 4, the Corporation at its expense shall promptly compute such adjustment or readjustment in accordance with the terms hereof and prepare and furnish to each holder of Series Preferred Stock a certificate setting forth such adjustment or readjustment and showing in detail the facts upon which such adjustment or readjustment is based. The Corporation shall, upon the written request at any time of any holder of Series Preferred Stock, furnish or cause to be furnished to such holder a like certificate setting forth (i) such adjustments and readjustments, (ii) the applicable Conversion Rate at the time in effect, and (iii) the number of shares of Common Stock and the amount, if any, of other property which at the time would be received upon the conversion of such series of Preferred Stock.

(h) Notices of Record Date. In the event of any taking by the Corporation of a record of the holders of any class of securities for the purpose of (i) determining the holders thereof who are entitled to receive any dividend (other than a cash dividend) or other distribution, any Common Stock Equivalents or any right to subscribe for, purchase or otherwise acquire any shares of stock of any class or any other securities or property, or to receive any other right, (ii) effecting any reclassification or recapitalization of its shares of Common Stock outstanding involving a change in the shares of Common Stock, or (iii) merging or consolidating with or into any other corporation, or selling, leasing or conveying all or substantially all its property or business, or liquidating, dissolving or winding up, the Corporation shall mail to each holder of Series Preferred Stock at least twenty (20) days prior to the date specified therein, a notice specifying the date on which any such record is to be taken for the purpose of such dividend, distribution, right, reclassification, recapitalization, consolidation, sale, lease, conveyance, liquidation, dissolution or winding up, and the amount and character of such dividend, distribution, right, reclassification, recapitalization, consolidation, sale, lease, conveyance,

liquidation, dissolution or winding up. Failure to give such notice shall not in any way affect the legality of such transaction.

(i) Reservation of Stock Issuance Upon Conversion. The Corporation shall at all times reserve and keep available, free from preemptive rights, out of its authorized but unissued shares of Common Stock, solely for the purpose of effecting the conversion of the shares of Series Preferred Stock, such number of its shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding shares of Series Preferred Stock. If at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all the then outstanding shares of Series Preferred Stock the Corporation will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purpose.

(j) Notices. Any notice required by the provisions of this Paragraph 4 to be given to the holders of shares of Series Preferred Stock shall be deemed given upon personal delivery; on the fifth (5th) business day following mailing by United States Mail, postage prepaid, by registered or certified mail; on the second (2nd) business day following delivery to a courier service such as DHL or Federal Express; or upon electronic acknowledgement of receipt if sent by fax, in each case to the address and/or fax number of each holder of record as it appears on the books of the Corporation.

(k) No Reissuance of Series Preferred Stock. No share or shares of Series Preferred Stock acquired by the Corporation by reason of redemption, purchase, conversion or otherwise shall be reissued, and all such shares shall be cancelled, retired and eliminated from the shares which the Corporation shall be authorized to issue.

(l) Validity of Shares. The Corporation agrees that it will from time to time take all such actions as may be required to assure that all shares of Common Stock which may be issued upon conversion of any Series Preferred Stock will, upon issuance, be legally and validly issued, fully paid and nonassessable and free from all taxes, liens and charges with respect to the issue thereof.

(m) Taxes. The Corporation will pay all taxes and other governmental charges that may be imposed in respect of the issue or delivery of shares of Common Stock upon conversion of the Series Preferred Stock.

(n) Good Faith. If any event occurs as to which in the reasonable opinion of the Board of the Corporation, in good faith, the other provisions of this Paragraph 4 are not strictly applicable but the lack of any adjustment in the Conversion Prices would not in the opinion of the Board fairly protect the conversion rights of the holders of the Series Preferred Stock in accordance with the basic intent and principles of such provisions, or if strictly applicable would not fairly protect the conversion rights of the holders of the Series Preferred Stock in accordance with the basic intent and principles of such provisions, then the Board of the Corporation shall appoint a firm of independent certified public accountants (which may be the regular auditors of the Corporation) of recognized national standing, which shall give their opinion upon the

adjustment, if any, to the respective Conversion Prices, on a basis consistent with the basic intent and principles of this Paragraph 4, necessary to preserve, without dilution, the exercise rights of all the registered holders of the Series Preferred Stock. Upon receipt of such opinion, the Board shall forthwith make the adjustments described therein.

5. Voting Rights. Except as otherwise required by law or this Restated Certificate of Incorporation, each share of (i) Common Stock issued and outstanding shall have one (1) vote per share; (ii) Series A Preferred Stock issued and outstanding shall have the number of votes equal to ten (10) times the number of shares of Common Stock into which such share of Series A Preferred Stock could be converted on the record date for the vote or consent of stockholders; (iii) Series B Preferred Stock issued and outstanding shall have the number of votes equal to the number of shares of Common Stock into which such share of Series B Preferred Stock could be converted on the record date for the vote or consent of stockholders; (iv) Series C Preferred Stock issued and outstanding shall have the number of votes equal to ten (10) times the number of shares of Common Stock into which such share of Series C Preferred Stock could be converted on the record date for the vote or consent of stockholders; and (v) Series D Preferred Stock issued and outstanding shall have the number of votes equal to the number of shares of Common Stock into which such share of Series D Preferred Stock could be converted on the record date for the vote or consent of stockholders. The holder of each share of Series Preferred Stock shall be entitled to notice of any stockholders' meeting in accordance with the by-laws of the Corporation. The holders of Series Preferred Stock shall vote together with holders of the Common Stock upon all matters submitted to a vote of stockholders, except as otherwise required by law or this Restated Certificate of Incorporation.

6. Covenants.

(a) In addition to any other rights provided by law, at any time when shares of any series of Preferred Stock are outstanding, except where the vote or written consent of the holders of a greater number of shares of the Corporation is required by this Certificate of Incorporation, without the written consent of the holders of shares of Preferred Stock representing at least sixty percent (60%) of the voting power of the then outstanding shares of Preferred Stock, given in writing or by vote at a meeting, consenting or voting (as the case may be) as a separate class or, if such amendment would only materially adversely affect any of the rights, preferences, privileges or limitations provided herein of a series of Preferred Stock, without the vote or written consent of the holders of at least sixty percent (60%) of the then outstanding shares of such series of Preferred Stock, given in writing or by vote at a meeting, consenting or voting (as the case may be) as a separate series, the Corporation will not amend, alter or repeal any provision of, or add any provision to, this Restated Certificate of Incorporation (including any amendment, alteration or repeal of this Restated Certificate of Incorporation effected by operation of law or through a merger or consolidation) or by-laws if such action would materially adversely affect any of the preferences, rights, privileges or powers of, or the restrictions provided for the benefit of, the Preferred Stock or any series thereof.

(b) So long as any Series Preferred Stock shall be outstanding, the Corporation shall not without first obtaining the affirmative vote or written consent of the holders of eighty-five percent (85%) of such outstanding shares of Series Preferred Stock, except clause (vii) below

which shall require the affirmative vote or written consent of two-thirds (2/3) of outstanding shares of Series Preferred Stock, voting as a single class (provided that, notwithstanding paragraph 5 of this Article Fourth, each holder of Series Preferred Stock shall have one (1) vote per share):

(i) Increase or decrease the number of shares of Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock authorized hereby;

(ii) Authorize or issue shares of any class or series of stock having any dividend or distribution rights superior to or on a parity with the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock or authorize or issue shares of stock of any class or any bonds, debentures, notes or other obligations convertible into or exchangeable for, or having option rights to purchase, any shares of stock of the Corporation having any rights, preferences or privileges superior to or on a parity with the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock;

(iii) Reclassify any outstanding shares into shares having any dividend or distribution rights superior to or on a parity with the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock;

(iv) Repurchase, acquire or retire any shares of Series Preferred Stock or Junior Shares, except from employees, directors or consultants of this Corporation upon termination pursuant to terms of agreements entered into with such persons approved by the Board of Directors of the Corporation and providing for repurchase of such shares at cost;

(v) Undertake or effect any liquidation of the Corporation or any consolidation or merger of the Corporation with or into another corporation or the sale, transfer or conveyance of all or substantially all of the assets of the Corporation to another person or persons in any transaction or series of transactions, if the stockholders of this Corporation hold less than 50% of the outstanding voting equity securities of the successor or surviving corporation in such merger, consolidation, sale or conveyance of assets; provided, however, that the above-referenced consent of holders of Series Preferred Stock shall not be required under this subparagraph (v) if any of such transactions results in holders of Series Preferred Stock receiving consideration in the form of cash or publicly traded and readily marketable securities equal to or greater than the Series Liquidation Amount of each share of Series Preferred Stock held by such holders, plus all accrued but unpaid dividends thereon, and provided further that, in each case, such transaction does not involve CuraGen or any affiliates;

(vi) Create any subsidiary that is not a wholly-owned subsidiary, sell or otherwise dispose of any shares of capital stock of any corporation, at least 50% of the outstanding equity securities of which are owned directly or indirectly by the Corporation or by one or more subsidiaries, except to the Corporation or another subsidiary, or permit

any subsidiary to issue, sell or otherwise dispose of any shares of its capital stock or the capital stock of any subsidiary except to the Corporation or another subsidiary; or

(vii) Issue or commit to issue to any one party (except pursuant to clauses 6(c)(i) and 6(c)(ii) below), in a single transaction or series of related transactions, more than 3,073,611 shares of Common Stock or any securities convertible into (except for shares of Common Stock issuable upon conversion of the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock), or options, warrants, or rights to purchase, such shares of Common Stock (as adjusted for any stock dividends, stock splits, recapitalizations, consolidations or the like).

(c) The Corporation shall not without first obtaining the affirmative vote or written consent of the holders of a majority of the then outstanding shares of each series of the Corporation's preferred stock, voting as a single class:

(i) Issue or commit to issue more than 4,952,667 shares of Common Stock or any options, warrants or rights to purchase such shares of Common Stock (as adjusted for any stock dividends, stock splits, recapitalizations, consolidations or the like) to employees, officers, directors or consultants of the Corporation pursuant to any stock option plan, stock incentive or purchase plan or agreement;

(ii) Issue or commit to issue to CuraGen Corporation in the aggregate more than 3,073,611 shares of Common Stock or any securities convertible into (except for shares of Common Stock issuable upon conversion of the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock), or options, warrants, or rights to purchase, such shares of Common Stock (as adjusted for any stock dividends, stock splits, recapitalizations, consolidations or the like);

(iii) Reclassify any outstanding shares into shares having any rights, preferences or privileges superior to the Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock or Series D Preferred Stock; or

(iv) Amend Article III of this Restated Certificate of Incorporation.

FIFTH: Subject to the provisions of Article FOURTH, Paragraph 6 hereof, the Board of Directors is expressly empowered to adopt, amend or repeal the by-laws of the Corporation. Any adoption, amendment or repeal of the by-laws of the Corporation by the Board of Directors shall require the approval of a majority of the total number of authorized directors (whether or not there exist any vacancies in previously authorized directorships at the time any resolution providing for adoption, amendment or repeal is presented to the Board). The stockholders shall also have power to adopt, amend or repeal the by-laws of the Corporation. In addition to any vote of the holders of any class or series of stock of this Corporation required by law or by this Restated Certificate of Incorporation, the affirmative vote of the holders of at least two-thirds (2/3%) of the voting power of all of the then outstanding shares of the capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class, shall be required to adopt, amend or repeal any provisions of the by-laws of the

Corporation with respect to the indemnity of the directors, officers, employees or agents of the Corporation or any provisions with respect to the percentage vote required to amend the by-laws.

SIXTH: The following provisions are inserted for the management of the business and the conduct of the affairs of the Corporation, and for further definition, limitation and regulations of the powers of the Corporation and of its directors and stockholders:

A. The business and affairs of the Corporation shall be managed by or under the direction of the Board of Directors. In addition to the powers and authority expressly conferred upon them by statute or by this Restated Certificate of Incorporation or the by-laws of the Corporation, the directors are hereby empowered to exercise all such powers and do all such acts and things as may be exercised or done by the Corporation.

B. The directors of the Corporation need not be elected by written ballot unless the by-laws so provide.

C. The books of the Corporation may be kept at such place within or without the State of Delaware as the by-laws of the Corporation may provide or as may be designated from time to time by the Board of Directors of the Corporation.

SEVENTH: No director of this Corporation shall be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director except to the extent that exemption from liability or limitation thereof is not permitted under the General Corporation Law of the State of Delaware as in effect at the time such liability or limitation thereof is determined. No amendment, modification or repeal of this Article shall apply to or have any effect on the liability or alleged liability of any director of the Corporation for or with respect to any acts or omissions of such director occurring prior to such amendment, modification or repeal. If the General Corporation Law of the State of Delaware is amended after approval by the stockholders of this Article to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law of the State of Delaware, as so amended.

EIGHTH: The Corporation shall, to the fullest extent permitted by Section 145 of the General Corporation Law of the State of Delaware, as the same may be amended and supplemented from time to time, indemnify and advance expenses to (i) its directors and officers, and (ii) any person who at the request of the Corporation is or was serving as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, from and against any and all of the expenses, liabilities, or other matters referred to in or covered by such section as amended or supplemented (or any successor), provided, however, that the Corporation shall be obligated to indemnify any director, officer or such person in connection with a proceeding (or part thereof) initiated by such director, officer or such person only if such proceeding (or part thereof) was authorized by the Board of Directors of the Corporation. The Corporation, by action of its Board of Directors, may provide indemnification or advance expenses to employees and agents of the Corporation or other persons only on such terms and conditions and to the extent determined by the Board of Directors in its sole and absolute

discretion. The indemnification provided for herein shall not be deemed exclusive of any other rights to which those indemnified may be entitled under any By-Law, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in their official capacity and as to action in another capacity while holding such office, and shall continue as to a person who has ceased to be a director, officer, employee, or agent and shall inure to the benefit of the heirs, executors and administrators of such a person.

NINTH: Whenever a compromise or arrangement is proposed between this Corporation and its creditors or any class of them and/or between this Corporation and its stockholders or any class of them, any court of equitable jurisdiction within the State of Delaware may, on the application in a summary way of this Corporation or of any creditor or stockholder thereof or on the application of any receiver or receivers appointed for this Corporation under the provisions of Section 291 of the General Corporation Law of the State of Delaware or on the application of trustees in dissolution or of any receiver or receivers appointed for this Corporation under the provisions of Section 279 of the General Corporation Law of the State of Delaware, order a meeting of the creditors or class of creditors, and/or of the stockholders or class of stockholders of this Corporation, as the case may be, to be summoned in such manner as the said court directs. If a majority in number representing three-fourths (3/4) in value of the creditors or class of creditors, and/or of the stockholders or class of stockholders of this Corporation, as the case may be, agree to any compromise or arrangement and to any reorganization of this Corporation as consequence of such compromise or arrangement, such compromise or arrangement and such reorganization shall, if sanctioned by the court to which such application has been made, be binding on all the creditors or class of creditors, and/or on all the stockholders or class of stockholders, of this Corporation, as the case may be, and also on this Corporation.

TENTH: From time to time any of the provisions of this Restated Certificate of Incorporation may be amended, altered, changed or repealed, and other provisions authorized by the laws of the State of Delaware at the time in force may be added or inserted in the manner and at the time prescribed by said laws, and all rights at any time conferred upon the stockholders of the Corporation by this Restated Certificate of Incorporation are granted subject to the provisions of this Article.

IN WITNESS WHEREOF, this Restated Certificate of Incorporation which restates and integrates and further amends the provisions of the Restated Certificate of Incorporation of this Corporation, and which has been duly adopted in accordance with Sections 242 and 245 of the Delaware General Corporation Law, has been executed by its duly authorized officer this 17th day of September, 2003.

454 CORPORATION

By: Richard F. Begley
Richard F. Begley, Ph.D.
President and Chief Executive Officer

TRA 180377Bv8

PATENT

RECORDED: 10/12/2010

REEL: 025123 FRAME: 0116