

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT3763218

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	CHANGE OF NAME
CONVEYING PARTY DATA	
Name	Execution Date
ASM SCIENTIFIC, INC.	04/16/2008
RECEIVING PARTY DATA	
Name:	TWISTDX, INC.
Street Address:	2711 CENTERVILLE ROAD
Internal Address:	SUITE 400
City:	WILMINGTON
State/Country:	DELAWARE
Postal Code:	19886
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	13911268
CORRESPONDENCE DATA	
Fax Number:	(877)769-7945
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
Phone:	(617) 542-5070
Email:	apsi@fr.com
Correspondent Name:	IAN J. LODOVICE
Address Line 1:	FISH & RICHARDSON P.C.
Address Line 2:	P.O.BOX 1022
Address Line 4:	MINNEAPOLIS, MINNESOTA 55440-1022
ATTORNEY DOCKET NUMBER:	30170-0011006
NAME OF SUBMITTER:	MARY FLORCZAK
SIGNATURE:	/Mary Florczak/
DATE SIGNED:	03/01/2016
Total Attachments: 65	
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CERTIFICATE OF INCORPORATION
OF
ASM SCIENTIFIC, INC.

The undersigned, a natural person, for the purpose of organizing a corporation for conducting the business and promoting the purposes hereinafter stated, under the provisions and subject to the requirements of the laws of the State of Delaware (particularly Chapter 1, Title 8 of the Delaware Code and the acts amendatory thereof and supplemental thereto, and known, identified and referred to as the "General Corporation Law of the State of Delaware"), hereby certifies that:

FIRST: The name of the corporation (hereinafter called the "Corporation") is

ASM SCIENTIFIC, INC.

SECOND: The address, including street, number, city, and county, of the registered office of the Corporation in the State of Delaware is 1013 Centre Road, City of Wilmington, County of New Castle; and the name of the registered agent of the Corporation in the State of Delaware is Corporation Service Company.

THIRD: The nature of the business to be conducted and the purposes of the Corporation are:

To purchase or otherwise acquire, invest in, own, lease, mortgage, pledge, sell, assign and transfer or otherwise dispose of, trade and deal in and with real property and personal property of every kind, class and description (including, without limitation, goods, wares and merchandise of every kind, class and description), to manufacture goods, wares and merchandise of every kind, class and description, both on its own account and for others;

To make and perform agreements and contracts of every kind and description; and

Generally to engage in any lawful act or activity or carry on any business for which corporations may be organized under the Delaware General Corporation Law or any successor statute.

FOURTH:

The total number of shares of all classes of stock which the Corporation shall have authority to issue is Three Thousand (3,000), consisting of 3,000 shares of Common Stock, Zero Dollars and One Cent (\$0.01) Par Value per share (the "Common Stock").

FIFTH: The name and mailing address of the sole incorporator is as follows:

<u>Name</u>	<u>Mailing Address</u>
William T. Whelan	Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. One Financial Center Boston, MA 02111

SIXTH: The Corporation is to have perpetual existence.

SEVENTH: For the management of the business and for the conduct of the affairs of the Corporation, and in further definition and not in limitation of the powers of the Corporation and of its directors and of its stockholders or any class thereof, as the case may be, conferred by the State of Delaware, it is further provided that:

A. The management of the business and the conduct of the affairs of the Corporation shall be vested in its Board of Directors. The number of directors which shall constitute the whole Board of Directors shall be fixed by, or in the manner provided in, the By-Laws. The phrase "whole Board" and the phrase "total number of directors" shall be deemed to have the same meaning, to wit, the total number of directors which the Corporation would have if there were no vacancies. No election of directors need be by written ballot.

B. After the original or other By-Laws of the Corporation have been adopted, amended or repealed, as the case may be, in accordance with the provisions of Section 109 of the General Corporation Law of the State of Delaware, and, after the Corporation has received any payment for any of its stock, the power to adopt, amend, or repeal the By-Laws of the Corporation may be exercised by the Board of Directors of the Corporation.

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.

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 said section as amended or supplemented (or any successor), provided, however, that except with respect to proceedings to enforce rights to indemnification, the By-Laws of the Corporation may provide that the Corporation shall 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: 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.


TENTH: 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 Title 8 of the Delaware Code 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 Title 8 of the Delaware Code, 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, the said compromise or arrangement and the said reorganization shall, if sanctioned by the court to which the said 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.

ELEVENTH: From time to time any of the provisions of this Certificate of Incorporation may be amended, altered 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 Certificate of Incorporation are granted subject to the provisions of this Article.

TWELFTH: The effective date of filing of this Certificate of Incorporation shall be January 1, 1999.

I, the undersigned, being the sole incorporator, for the purpose of forming a Corporation under the laws of the State of Delaware, do make, file and record this Certificate of Incorporation, to certify that the facts herein stated are true, and accordingly have hereto set my hand this 22ND day of December, 1998.



William T. Whelan

**AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
ASM SCIENTIFIC, INC.**

Pursuant to Sections 242 and 245 of the General
Corporation Law of the State of Delaware

The undersigned, Catherine Balliet Stemple, is President of ASM Scientific, Inc., a corporation organized and existing under the General Corporation Law of the State of Delaware (the "Corporation"). The date of filing of the original Certificate of Incorporation with the Secretary of State of Delaware was December 23, 1998.

The undersigned, as President of the Corporation, does hereby certify that:

(a) The Board of Directors of the Corporation, by unanimous written consent in accordance with Section 141(f) of the General Corporation Law of the State of Delaware, duly adopted a resolution pursuant to Sections 242 and 245 of the General Corporation Law of the State of Delaware proposing to amend and restate the Certificate of Incorporation of the Corporation in its entirety, declaring said amendment and restatement to be advisable and authorizing the appropriate officers of the Corporation to solicit the consent of the stockholders therefore;

(b) Such amendment and restatement of the Certificate of Incorporation was duly approved by holders of a majority of the Corporation's common stock entitled to vote by written consent in accordance with the Sections 228, 242 and 245 of the General Corporation Law of the State of Delaware; and

(c) This Amended and Restated Certificate of Incorporation (hereafter "Restated Certificate") amends and restates the Certificate of Incorporation of the Corporation in its entirety as follows:

FIRST: The name of the Corporation is:

ASM Scientific, Inc.

SECOND: The address, including street, number, city and county, of the registered office of the Corporation in the State of Delaware is 2711 Centerville Road, Suite 400, City of Wilmington, County of New Castle and the name of the registered agent of the Corporation at that address is Corporation Service Company.

THIRD: The purpose for which the Corporation is organized 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.

FOURTH: The total number of shares of all classes of capital stock which the Corporation has the authority to issue is 5,000,000 shares, consisting of 4,000,000 shares of Common Stock, par value \$.01 per share (the "Common Stock"), and 1,000,000 shares of Preferred Stock, par value \$.01 per share (the "Preferred Stock"), all of which have been designated as Series A Convertible Preferred Stock (the "Series A Preferred").

The following is a statement of the relative powers, designations, preferences, special rights, privileges, qualifications, limitations, restrictions and other matters pertaining to the Common Stock and the Series A Preferred. All cross references in this Article FOURTH refer to other sections or subsections in this Article FOURTH unless otherwise indicated.

A. Common Stock.

1. General. All shares of Common Stock will be identical and will entitle the holders thereof to the same rights and privileges. The voting, dividend, liquidation and other rights of the holders of the Common Stock are subject to, and qualified by, the rights of the holders of the Preferred Stock.

2. Voting Rights. The holders of Common Stock will be entitled to one vote per share on all matters to be voted on by the Corporation's stockholders, except as otherwise required by law. There shall be no cumulative voting.

3. Dividends. Dividends may be declared and paid on the Common Stock from funds lawfully available therefor as and when determined by the Board of Directors in their sole discretion, subject to provisions of law, any provision of the Corporation's Restated Certificate of Incorporation, as amended from time to time, and subject to the relative rights and preferences of any shares of Preferred Stock authorized and issued hereunder.

4. Liquidation Rights. In the event of any liquidation, dissolution or winding up of the affairs of the Corporation, the holders of the Common Stock shall be entitled, subject to the rights and preferences, if any, of any holders of shares of Preferred Stock authorized and issued hereunder, to share, ratably in proportion to the number of shares of Common Stock held by them, in the remaining assets of the Corporation available for distribution to its stockholders.

B. Series A Preferred Stock.

The Series A Preferred shall have the rights, preferences, powers and privileges and the restrictions, qualifications and limitations set forth below:

1. Liquidation Rights.

(a) Treatment at Liquidation, Dissolution or Winding Up. In the event of any liquidation, dissolution or winding up of the affairs of the Corporation, whether voluntary or involuntary, the

holders of Series A Preferred shall be entitled to be paid ratably among the holders of Common Stock and the Series A Preferred, with the holders of Series A Preferred deemed to hold that number of shares of Common Stock into which such shares of Series A Preferred are convertible.

(b) Treatment of Reorganizations, Consolidations, Mergers and Sales of Assets. For purposes of this Section 1, a liquidation, dissolution or winding up of the Corporation shall be deemed to be occasioned by, or to include (unless the holders of at least a majority of the Series A Preferred then outstanding shall determine otherwise), (A) the acquisition of this corporation by another entity by means of any transaction or series of related transactions (including, without limitation, any reorganization, merger or consolidation) that results in the transfer of fifty percent (50%) or more of the outstanding voting power of this corporation; or (B) a sale of all or substantially all of the assets of this corporation. The provisions of this Subsection 1(b) shall not apply to any reorganization, merger or consolidation involving (1) only a change in the state of incorporation of the Corporation or (2) a merger of the Corporation with or into a wholly-owned subsidiary of the Corporation which is incorporated in the United States of America.

(c) Distributions other than Cash. Whenever the distribution provided for in this Section 1 shall be payable in property other than cash, the value of such distribution shall be the fair market value of such property as determined in good faith by the Board of Directors of the Corporation.

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

(a) Right to Convert; Conversion Price. Each share of Series A Preferred shall be convertible, without the payment of any additional consideration by the holder thereof and 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 A Preferred, into such number of fully paid and non-assessable shares of Common Stock as is determined by dividing \$0.85 by the Conversion Price, determined as hereinafter provided, in effect at the time of conversion. The Conversion Price for purposes of calculating the number of shares of Common Stock deliverable upon conversion without the payment of any additional consideration by the holder of Series A Preferred (the "Conversion Price") shall initially be \$0.85. Such initial Conversion Price shall be subject to adjustment, in order to adjust the number of shares of Common Stock into which Series A Preferred is convertible, as hereinafter provided in subsection 2(d).

(b) Mechanics of Conversion. Before any holder of Series A Preferred shall be entitled to convert the same into full shares of Common Stock, such holder shall surrender the certificate or certificates therefor, duly endorsed, at the office of the Corporation or of any transfer agent for the Series A Preferred, 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 of such holder or the name or names of the nominees of such holder in which such holder wishes the certificate or certificates for shares of Common Stock to be issued. No fractional shares of Common Stock shall be issued upon conversion of any shares of Series A Preferred. In lieu of any fractional shares of Common Stock to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the then effective Conversion Price. The Corporation shall, as soon as practicable thereafter, issue and deliver at such office to such holder of Series A Preferred, 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, together with cash in lieu of any fraction of a share. 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 A Preferred to be converted, and the person or persons entitled to receive the shares of Common Stock issuable upon conversion shall be treated for all purposes as the record holder or holders of such shares of Common Stock on such date.

(c) Automatic Conversion.

(i) Each share of Series A Preferred shall automatically be converted into shares of Common Stock at the then effective Conversion Price upon:

(A) The closing of a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, covering the offer and sale of Common Stock to the public at a per share purchase price of not less than \$2.55 and with gross proceeds to the sellers of not less than \$15,000,000 (a "Qualified IPO"); or

(B) The written election of the holders of not less than a majority in voting power of the then outstanding shares of Series A Preferred to require such mandatory conversion.

(ii) Upon the occurrence of an event specified in Section 2(c)(i) hereof, all shares of Series A Preferred shall be converted automatically without any further action by any holder of such shares and whether or not the certificate or certificates representing such shares are surrendered to the Corporation or the transfer agent for the Series A Preferred, provided, however, that the Corporation shall not be obligated to issue a certificate or certificates evidencing the shares of Common Stock into which such shares of Series A Preferred were convertible unless the certificate or certificates representing such shares of Series A Preferred being converted are either delivered to the Corporation or the transfer agent of the Series A Preferred, or the holder notifies the Corporation or such transfer agent that such certificate or certificates have been lost, stolen, or destroyed and executes and delivers an agreement satisfactory to the Corporation to indemnify the Corporation from any loss incurred by it in connection therewith and, if the Corporation so elects, provides an appropriate indemnity.

(iii) Upon the automatic conversion of Series A Preferred, each holder of Series A Preferred shall surrender the certificate or certificates representing such holder's shares of Series A Preferred at the office of the Corporation or of the transfer agent for the Series A Preferred. Thereupon, there shall be issued and delivered to such holder, promptly at such office and in such holder's name as shown on such surrendered certificate or certificates, a certificate or certificates for the number of shares of Common Stock into which the shares of Series A Preferred surrendered were convertible on the date on which such automatic conversion occurred. No fractional shares of Common Stock shall be issued upon the automatic conversion of Series A Preferred. In lieu of any fractional shares of Common Stock to which the holder would otherwise be entitled, the

corporation shall pay cash equal to such fraction multiplied by the then effective Conversion Price.

(d) Adjustments to Conversion Price for Diluting Issues.

(i) Special Definitions. For purposes of this Section 2(d), the following definitions shall apply:

(A) "Option" shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

(B) "Original Issue Date" shall mean the date on which shares of Series A Preferred were first issued.

(C) "Convertible Securities" shall mean any evidences of indebtedness, shares (other than Common Stock and Series A Preferred) or other securities directly or indirectly convertible into or exchangeable for Common Stock.

(D) "Additional Shares of Common Stock" shall mean all shares of Common Stock issued (or, pursuant to Section 2(d)(iii), deemed to be issued, collectively referred to in this Section 2 as "Common Stock") by the Corporation after the Original Issue Date, other than the following (collectively, "Excluded Shares"):

(I) shares of Common Stock issued or issuable by reason of a dividend, stock split, conversion or other distribution on shares of the Series A Preferred or, subject to section 2(d)(iii)(B), the Common Stock;

(II) shares of Common Stock issued or issuable to officers, employees or directors of, or consultants to, the Corporation pursuant to the Corporation's 2002 Employee, Director and Consultant Stock Plan or any other plan approved by the Board of Directors;

(III) shares of Common Stock issued in connection with joint ventures, strategic alliances, partnerships, leasing or financing arrangements primarily for non-equity financing purposes approved by the Board of Directors;

(IV) shares of Common Stock issued in connection acquisitions of or by the Corporation whether by merger, consolidation, sale of assets, sale or exchange of stock or otherwise approved by the Board of Directors;

(V) shares of Common Stock issued upon exchange of Convertible Securities approved by the Board of Directors; and

(VI) shares of Common Stock issued in a Qualified IPO.

(ii) No Adjustment of Conversion Price. No adjustment in the number of shares of Common Stock into which a share of Series A Preferred is convertible shall be made by adjustment in the Conversion Price in respect of the issuance of Additional Shares of Common Stock or otherwise unless (i) the consideration per share for an Additional Share of Common Stock issued or deemed to be issued by the Corporation is less than the Conversion Price in effect on the date of, and immediately prior to, the issue of such Additional Shares of Common Stock and (ii) prior to such issuance, the Corporation fails to receive written notice from the holders of at least a majority of the then outstanding shares of Series A Preferred agreeing that no such adjustment shall be made as the result of the issuance of Additional Shares of Common Stock.

(iii) Issue of Securities Deemed Issue of Additional Shares of Common Stock.

(A) Options and Convertible Securities. Except for Options or Convertible Securities that are included in the definition of Excluded Shares, in the event the Corporation at any time after the Original Issue Date shall issue any Options or Convertible Securities or shall fix a record date for the determination of holders of any class of securities entitled to receive any such Options or Convertible Securities, then 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 upon the exercise of such Options or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, shall be deemed to be Additional Shares of Common Stock issued as of the time of such issue or, in case such a record date shall have been fixed, as of the close of business on such record date, provided that Additional Shares of Common Stock shall not be deemed to have been issued unless the consideration per share (determined pursuant to Section 2(d)(v) hereof) of such Additional Shares of Common Stock would be less than the Conversion Price in effect on the date of and immediately prior to such issue, or such record date, as the case may be, and provided further that in any such case in which Additional Shares of Common Stock are deemed to be issued:

(I) No further adjustment in the Conversion Price shall be made upon the subsequent issue of Convertible Securities or shares of Common Stock upon the exercise of such Options or conversion or exchange of such Convertible Securities;

(II) If such Options or Convertible Securities by their terms provide, with the passage of time or otherwise, for any increase in the consideration payable to the Corporation, or decrease in the number of shares of Common Stock issuable upon the exercise, conversion or exchange thereof, the Conversion Price computed upon the original issue thereof (or upon the occurrence of a record date with respect thereto), and any subsequent adjustments based thereon, shall, upon any such increase or decrease becoming effective, be recomputed to reflect such increase or

decrease insofar as it affects such Options or the rights of conversion or exchange under such Convertible Securities;

(III) Upon the expiration of any such options or any rights of conversion or exchange under such Convertible Securities which shall not have been exercised, the Conversion Price computed upon the original issue 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:

(a) In the case of Convertible Securities or Options for Common Stock the only Additional Shares of Common Stock issued were the shares of Common Stock, if any, actually issued upon the exercise of such Options or the conversion or exchange of such Convertible Securities and the consideration received therefor was the consideration actually received by the Corporation for the issue of all such Options, whether or not exercised, plus the consideration actually received by the Corporation upon such exercise, or for the issue of all such Convertible Securities which were actually converted or exchanged, plus the additional consideration, if any, actually received by the Corporation upon such conversion or exchange; and

(b) In the case of Options for Convertible Securities only the Convertible Securities, if any, actually issued upon the exercise thereof were issued at the time of issue of such Options, and the consideration received by the Corporation for the Additional Shares of Common Stock deemed to have been then issued was the consideration actually received by the Corporation for the issue of all such Options, whether or not exercised, plus the consideration deemed to have been received by the Corporation (determined pursuant to Section 2(d)(v)) upon the issue of the Convertible Securities with respect to which such Options were actually exercised;

(IV) No readjustment pursuant to clause (II) or (III) above shall have the effect of increasing the Conversion Price to an amount which exceeds the lower of (a) the Conversion Price prior to the original adjustment for such deemed issuance, or (b) the Conversion Price that would have resulted from any issuance of Additional Shares of Common Stock between the original adjustment date and such readjustment date;

(V) In the case of any Options which expire by their terms not more than 30 days after the date of issue thereof, no adjustment of the Conversion Price shall be made until the expiration or exercise of all such Options, whereupon such adjustment shall be made in the same manner provided in clause (III) above; and

(VI) If such record date shall have been fixed and such Options or Convertible Securities are not issued on the date fixed therefor, the adjustment previously made in the Conversion Price which became effective on such record date shall be canceled as of the close of business on such record date, and thereafter the Conversion Price shall be adjusted pursuant to this Section 2(d)(iii) as of the actual date of their issuance.

(B) Stock Dividends, Stock Distributions and Subdivisions. In the event the Corporation at any time or from time to time after the Original Issue Date shall declare or pay any dividend or make any other distribution on the Common Stock payable in Common Stock or effect a subdivision of the outstanding shares of Common Stock (by reclassification or otherwise than by payment of a dividend in Common Stock), then and in any such event, Additional Shares of Common Stock shall be deemed to have been issued:

(I) In the case of any such dividend or distribution, immediately after the close of business on the record date for the determination of holders of any class of securities entitled to receive such dividend or distribution, or

(II) In the case of any such subdivision, at the close of business on the date immediately prior to the date upon which corporate action becomes effective.

If such record date shall have been fixed and no part of such dividend shall have been paid on the date fixed therefor, the adjustment previously made for the Conversion Price which became effective on such record date shall be canceled as of the close of business on such record date, and thereafter the Conversion Price shall be adjusted pursuant to this Section 2(d)(iii) as to the time of actual payment of such dividend.

(iv) Adjustment of Conversion Price Upon Issuance of Additional Shares of Common Stock.

(A) In the event the Corporation shall issue Additional Shares of Common Stock (including, without limitation, Additional Shares of Common Stock deemed to be issued pursuant to Section 2(d)(iii) but excluding Additional Shares of Common Stock deemed to be issued pursuant to Section 2(d)(ii)(B), which event is dealt with in Section 2(d)(vi) hereof), without consideration or for a consideration per share less than the applicable Conversion Price in effect on the date of and immediately prior to such issue, then and in such event, such Conversion Price shall be reduced, concurrently with such issue in order to increase the number of shares of Common Stock into which the Series A Preferred is convertible, to a price (calculated to the nearest cent) determined by multiplying such Conversion Price by a fraction, the numerator of which shall be (I) the number of shares of Common Stock outstanding immediately prior to such issue (including shares of Common Stock underlying any outstanding Option or

Convertible Securities) plus (II) the number of shares of Common Stock which the aggregate consideration received or deemed to have been received by the Corporation for the total number of Additional Shares of Common Stock so issued would purchase at such Conversion Price, and the denominator of which shall be (I) the number of shares of Common Stock outstanding immediately prior to such issue (including shares of Common Stock underlying any outstanding Option or Convertible Securities) plus (II) the number of Additional Shares of Common Stock so issued or deemed to be issued.

(B) Notwithstanding anything to the contrary contained herein, the applicable Conversion Price in effect at the time Additional Shares of Common Stock are issued or deemed to be issued shall not be reduced pursuant to Section 2(d)(iv)(A) hereof at such time if the amount of such reduction would be an amount less than \$0.01, but any such amount shall be carried forward and reduction with respect thereto made at the time of and together with any subsequent reduction which, together with such amount and any other amount or amounts so carried forward, shall aggregate \$0.01 or more.

(v) Determination of Consideration. For purposes of this Section 2(d), the consideration received by the Corporation for the issue of any Additional Shares of Common Stock shall be computed as follows:

(A) Cash, Property and Services. Such consideration shall:

(I) Insofar as it consists of cash, be computed at the aggregate amounts of cash received by the Corporation excluding amounts paid or payable for accrued interest or accrued dividends;

(II) Insofar as it consists of property or services other than cash, be computed at the fair market value thereof at the time of such issue, as determined in good faith by the Board of Directors; and

(III) In the event that Additional Shares of Common Stock are issued together with other shares or securities or other assets of the Corporation for consideration which covers both, be the proportion of such consideration so received, computed as provided in clauses (I) and (II) above, as determined in good faith by the Board of Directors.

(B) Options and Convertible Securities. The consideration per share received by the Corporation for Additional Shares of Common Stock deemed to have been issued pursuant to Section 2(d)(iii)(A), relating to Options and Convertible Securities, shall be determined by dividing (I) the total amount, if any, received or receivable by the Corporation as consideration for the issue of such Options or Convertible Securities, plus the minimum aggregate amount of additional consideration (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such consideration) payable to the Corporation upon the exercise of such Options or

the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities, by (II) the maximum number of shares of Common Stock (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or the conversion or exchange of such Convertible Securities.

(vi) Adjustment for Dividends, Distributions, Subdivisions, Combinations or Consolidations of Common Stock.

(A) Stock Dividends, Distributions or Subdivisions. In the event the Corporation shall issue Additional Shares of Common Stock pursuant to Section 2(d)(iii)(B) in a stock dividend, stock distribution or subdivision, the Conversion Price in effect immediately prior to such stock dividend, stock distribution or subdivision shall, concurrently with the effectiveness of such stock dividend, stock distribution or subdivision, be proportionately decreased.

(B) Combinations or Consolidations. In the event the outstanding shares of Common Stock shall be combined or consolidated, by reclassification or otherwise, into a lesser number of shares of Common Stock, the Conversion Price in effect immediately prior to such combination or consolidation shall, concurrently with the effectiveness of such combination or consolidation, be proportionately increased.

(e) No Impairment. The Corporation shall not, by amendment of its Certificate of Incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms to be observed or performed hereunder by the Corporation but shall at all times in good faith assist in the carrying out of all the provisions of this Section 2 and in the taking of all such action as may be necessary or appropriate in order to protect the conversion rights of the holders of Series A Preferred against impairment.

(f) Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of the Conversion Price pursuant to this Section 2, the Corporation at its expense shall promptly compute such adjustment or readjustment in accordance with the terms hereof and furnish to each affected holder of Series A Preferred, 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 affected holder of Series A Preferred furnished to such holder a like certificate setting forth (i) such adjustments and readjustments, (ii) the Conversion Price 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 conversion of each share of Series A Preferred.

(g) 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 determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends

paid in previous quarters) or other distribution, the Corporation shall mail to each holder of Series A Preferred at least twenty (20) days prior to such record date a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(h) Common Stock Reserved. The Corporation shall reserve and keep available out of its authorized but unissued Common Stock such number of shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding shares of Series A Preferred; and if at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Series A Preferred Stock, in addition to such other remedies as shall be available to the holder of such 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 purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to this Restated Certificate.

(i) Certain Taxes. The Corporation shall pay any issue or transfer taxes payable in connection with the conversion of any shares of Series A Preferred, provided, however, that the Corporation shall not be required to pay any tax which may be payable in respect of any transfer to a name other than that of the holder of such Series A Preferred.

(j) Closing of Books. The corporation shall at no time close its transfer books against the transfer of any Series A Preferred, or of any shares of Common Stock issued or issuable upon the conversion of any shares of Series A Preferred in any manner which interferes with the timely conversion or transfer of such Series A Preferred.

3. Voting Rights; Protective Provisions.

(a) Except as otherwise required by law or this Restated Certificate, the holders of Series A Preferred and the holders of Common Stock shall be entitled to notice of any stockholders' meeting and to vote as a single class upon any matter submitted to the stockholders for a vote, on the following basis:

(i) holders of Common Stock shall have one vote per share of Common Stock held by them; and

(ii) holders of Series A Preferred shall have that number of votes per share of Series A Preferred as is equal to the number of shares of Common Stock into which each such share of Series A Preferred held by such holder could be converted on the date for determination of stockholders entitled to vote at the meeting.

(b) As long as at least a majority of shares of Series A Preferred originally issued remain outstanding, at each election of directors the holders of such shares of Series A Preferred shall be entitled to elect one (1) director of the Corporation nominated by the holders of the Series A Preferred (the "Series A Director"). The holders of outstanding Common Stock shall be entitled to elect two (2) directors of the Corporation at each election of directors, one of whom shall be the Corporation's chief executive officer, or if none is so appointed, the President. The holders of Series A Preferred and Common Stock (voting together as a single class) shall be entitled to

elect any remaining directors of the Corporation, the first two of which shall be persons who (i) are not affiliated with Corporation or the holders of Series A Preferred and (ii) have been nominated by the officers of the Corporation with the approval of the Series A Director (the "Independent Directors").

In the case of any vacancy (other than a vacancy caused by removal) in the office of a director occurring among the directors elected by the holders of a class or series of stock pursuant to this Section 3(b), the remaining directors so elected by that class or series may by affirmative vote of a majority thereof (or the remaining director so elected if there be but one, or if there are no such directors remaining, by the affirmative vote of the holders of a majority of the shares of that class or series), elect a successor or successors to hold office for the unexpired term of the director or directors whose place or places shall be vacant. Any director who shall have been elected by the holders of a class or series of stock or by any directors so elected as provided in the immediately preceding sentence hereof may be removed during the aforesaid term of office, either with or without cause, by, and only by, the affirmative vote of the holders of the shares of the class or series of stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or pursuant to a written consent of stockholders, and any vacancy thereby created may be filled by the holders of that class or series of stock represented at the meeting or pursuant to unanimous written consent.

(c) Except as expressly provided herein or required by law, for so long as any shares of the Series A Preferred remain outstanding, then without the approval by vote or written consent of the holders of a majority of the then outstanding shares of the Series A Preferred voting as a separate class (each share of the Series A Preferred to be entitled to one vote for each share of the Common Stock into which it is then convertible), the Corporation shall not:

(i) sell, convey, or otherwise dispose of all or substantially all of its property or business or merge into or consolidate with any other corporation (other than a wholly-owned subsidiary corporation) or effect any transaction or series of related transactions if the holders of the equity of the Corporation immediately prior to such transaction will not own, directly or indirectly, at least fifty percent (50%) of the voting power of the equity of the surviving or successor entity;

(ii) effect, approve, authorize or permit a liquidation, dissolution or winding up of the Corporation;

(iii) amend, alter or repeal any of the provisions of the Restated Certificate or By-Laws or in any way change the preferences, privileges, rights or powers with respect to the Series A Preferred Stock, if any such alteration or change would adversely affect the rights of the holders of the Series A Preferred;

(iv) redeem, purchase, or otherwise acquire for value any shares of the Common Stock, except for the repurchase of options or shares of the Common Stock held by employees, consultants, directors, or officers of the Corporation that are subject to stock repurchase agreements approved by the Board of Directors under which the Corporation has the right to repurchase such options or shares in the event of termination of employment or the termination of the consulting relationship.

(v) declare or distribute any dividend (other than a stock dividend) on any series of capital stock of the Corporation ranking junior to the Series A Preferred with respect to dividends or rights upon liquidation, dissolution, or winding up the Common Stock;

(vi) authorize or issue, or obligate itself to authorize or issue, any other equity security having any preference or priority over, or ranking senior to or on parity with, the Series A Preferred with respect to dividends or rights upon liquidation, dissolution, or winding up; or

(vii) sell, convey, or otherwise dispose of all or substantially all of its intellectual property other than in the ordinary course of business, unless such transaction has been unanimously approved by the Board of Directors.

The holders of the Series A Preferred shall vote as a separate class with respect to any matter or proposed action as to which applicable law or this Restated Certificate require the vote, consent, or approval of the holders of the Series A Preferred voting as a separate class.

4. Dividend Rights. In the event that the Board of Directors of the Corporation shall declare dividends on the Common Stock out of funds legally available therefor, then such dividends shall be declared pro rata on the Common Stock and the Series A Preferred on a pari passu basis according to the number of shares of Common Stock held by the holders of shares of Series A Preferred, where such holder is treated for this purpose as holding the greatest whole number of shares of Common Stock then issuable upon conversion of all shares of Series A Preferred held by such holder pursuant to Section 2 hereof.

5. Redemption of Series A Preferred Stock.

(a) At the Election of Holders of Series A Preferred Stock. At any time on or after the September 17, 2005, the holders of a majority of the Series A Preferred may elect to have the Corporation redeem all of the then outstanding shares of Series A Preferred held by such holders at a price per share equal to the Redemption Price set forth in Section 5(c) below by giving a written notice to the Corporation of such election (the "Redemption Notice"), whereupon the Corporation shall immediately provide a written notice of such election to the remaining holders of Series A Preferred that have not provided the Redemption Notice specifying the date on which the redemption of such shares of Series A Preferred shall occur (the "Redemption Date"); such date shall be not less than twenty (20) days nor more than thirty (30) days after the date of the Redemption Notice. Each remaining holder of Series A Preferred may elect to participate in such redemption by providing written notice of such election to the Corporation at any time not more than twenty (20) days after the receipt of such notice from the Corporation. The Corporation shall, unless otherwise prevented by law, redeem from each such electing holder on the Redemption Date all of the shares of Series A Preferred Stock held by such holder.

(b) Redemption Price and Payment. The Series A Preferred to be redeemed on the Redemption Date shall be redeemed by paying for each share an amount in cash equal to \$0.85 per share of Series A Preferred (which amount shall be subject to equitable adjustment whenever there shall occur a stock dividend, distribution, combination of shares, reclassification or other

similar event with respect to Series A Preferred) plus all dividends declared but unpaid, computed to the Redemption Date; such amount is referred to as the "Redemption Price."

(c) Redemption Closing. The closing of the Corporation's redemption of the Series A Preferred pursuant to this Section 5 shall take place at 11:00 a.m. Eastern Standard Time on the Redemption Date at the Corporation's principal executive office or other mutually agreed upon location where the closing will occur. At the closing, the Corporation shall pay to each holder of Series A Preferred from whom shares of Series A Preferred are being redeemed an amount equal to the aggregate Redemption Price for all such shares against receipt from such holder of the certificate or certificates, duly endorsed or assigned to the Corporation in blank, representing the shares of Series A Preferred being redeemed. All such payments shall be made by wire transfer of immediately available funds or, if any such holder shall not have specified wire transfer instructions to the Corporation prior to the closing, by certified or official bank check payable to the order of the holder.

(d) Insufficient Funds. If the Corporation shall not be permitted, or shall not have funds legally available in the amount necessary, to redeem all shares of Series A Preferred to be redeemed on the Redemption Date, then the Series A Preferred Stock shall be redeemed by the Corporation on such Redemption Date to the maximum extent the Corporation is permitted and has funds legally available on a pro rata basis, in accordance with the number of shares then owned by each such holder of Series A Preferred. The Corporation shall immediately redeem such shares of Series A Preferred upon the termination of such legal prohibition and at any time thereafter when additional funds of the Corporation are legally available for the redemption of such shares of Series A Preferred, such funds will be used to redeem the balance of such shares, or such portion thereof for which funds are then legally available, on the basis set forth above.

(e) Effect of Redemption. From and after the close of business on the Redemption Date, unless there shall have been a default in the payment of the Redemption Price, all rights (except the right to receive the Redemption Price) of the holders of Series A Preferred with respect to the shares of Series A Preferred to be redeemed on such date shall cease and terminate, and such shares shall not thereafter be transferred on the books of the Corporation or be deemed to be outstanding for any purpose whatsoever whether or not the certificates representing such shares have been received by the Corporation; provided, however, that, notwithstanding anything contained herein to the contrary, (A) if the Corporation defaults in the payment of the Redemption Price, the rights of such holders with respect to such shares of Series A Preferred shall continue until the Corporation cures such default, and (B) without limiting any other rights of such holders, upon the occurrence of a subsequent liquidation, with respect to the shares of Series A Preferred in respect of which the payment of the Redemption Price has not occurred, such holders shall be accorded the liquidation rights set forth in this Restated Certificate in respect of such remaining shares, as if no prior redemption request had been made. The shares of Series A Preferred not redeemed shall remain outstanding and entitled to all rights and preferences provided herein.

6. No Reissuance of Series A Preferred. No share or shares of Series A Preferred acquired by the Corporation by reason of redemption, purchase, conversion or otherwise shall be reissued, and all such shares shall be canceled, retired and eliminated from the shares which the corporation shall be authorized to issue.

7. Residual Rights. All rights accruing to the outstanding shares of the Corporation not expressly provided for in the terms of the Series A Preferred shall be vested in the Common Stock.

8. Preemptive Rights.

(a) Notice of New Issuance. Except with respect to "Exempt Issuances" as defined in Section 8(c) hereof, in the event that the Corporation plans to issue any (i) shares of Common Stock, (ii) warrants, options or other rights to purchase Common Stock (collectively, "Rights"), or (iii) any debentures or other securities convertible into or exchangeable for shares of Common Stock (collectively, "Convertible Securities"), the Corporation will deliver to the holders of Series A Preferred a notice (the "Offer Notice") of such issuance (the "New Issuance") stating (a) its bona fide intention to offer such shares of Common Stock, Rights or Convertible Securities, (b) the number of such shares of Common Stock, Rights or Convertible Securities to be offered, and (c) the price and terms upon which it proposes to offer such shares of Common Stock, Rights or Convertible Securities.

(b) Right to Purchase Shares, Rights or Convertible Securities. In the event of a New Issuance (other than an Exempt Issuance), as long as at least a majority of shares of Series A Preferred originally issued remain outstanding, then the holders of such shares of Series A Preferred shall have the right to purchase all, but not less than all, of such number of shares of Common Stock, Rights or Convertible Securities at the price and on the terms upon which the New Issuance was made, such price to be paid in full in cash or by check at the time of issuance of such securities to the holders of Series A Preferred so that, after giving effect to the issuance to the holders of Series A Preferred and the conversion, exercise and exchange into or for (whether directly or indirectly) shares of Common Stock of all such Rights and Convertible Securities, each holder of Series A Preferred who exercises such right will continue to maintain its same proportionate ownership of Common Stock as of the date immediately preceding the New Issuance, treating each holder of Series A Preferred, for the purpose of such computation, as the holder of the number of shares of Common Stock which would be issuable to it upon conversion, exercise and exchange of all Rights and Convertible Securities held by it on the date immediately preceding the New Issuance and assuming the like conversion, exercise and exchange of all such securities held by other persons. The rights set forth in this Section 8 shall be exercised by the holders of Series A Preferred if at all, by written notice to the Corporation delivered not later than ten (10) days after the receipt by the holders of Series A Preferred of the Offer Notice in accordance with the terms and conditions stated therein, and such right shall expire at the end of the ten (10th) day after the day of the receipt by the holders of Series A Preferred of the Offer Notice.

(c) Exempt Issuances. The issuances referred to in Section 8(a) which will not give the holders of Series A Preferred the rights described in Section 8(b) (the "Exempt Issuances") are issuances in which shares of Common Stock or Rights or Convertible Securities of the Corporation are issued or deemed issued (i) as a dividend or distribution payable pro rata to all holders of

Common Stock or other securities of the Corporation; (ii) to employees, consultants, officers and directors of the Corporation in the form of options to purchase shares of Common Stock pursuant to the Corporation's 2002 Employee, Director and Consultant Stock Plan or any other equity plan or arrangement for the Corporation's employees, directors and/or consultants approved by the Corporation's Board of Directors; (iii) in connection with the conversion or exercise of any Rights or Convertible Securities; (iv) in connection with joint ventures, strategic alliances, partnerships, leasing or financing arrangements primarily for non-equity financing purposes approved by the Board of Directors; (v) in connection with acquisitions of or by the Corporation whether by merger, consolidation, sale of assets, sale or exchange of stock or otherwise; or (vi) in a Qualified IPO.

FIFTH: The Corporation is to have perpetual existence.

SIXTH: For the management of the business and for the conduct of the affairs of the Corporation, and in further definition and not in limitation of the powers of the Corporation and of its directors and of its stockholders or any class thereof, as the case may be, conferred by the State of Delaware, it is further provided that:

(a) The management of the business and the conduct of the affairs of the Corporation shall be vested in its Board of Directors. Subject to the provisions of this Restated Certificate, the number of directors which shall constitute the whole Board of Directors shall be fixed by, or in the manner provided in, the By-Laws. The phrase "whole Board" and the phrase "total number of directors" shall be deemed to have the same meaning, to wit, the total number of directors which the Corporation would have if there were no vacancies. No election of directors need be by written ballot.

(b) After the original or other By-Laws of the Corporation have been adopted, amended or repealed, as the case may be, in accordance with the provisions of Section 109 of the General Corporation Law of the State of Delaware, and, after the Corporation has received any payment for any of its stock, the power to adopt, amend or repeal the By-Laws of the Corporation may be exercised by the Board of Directors of the Corporation.

(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: 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 said section as amended or supplemented (or any successor), provided, however, that except with respect to proceedings to enforce rights to indemnification, the By-Laws of the Corporation may provide that the Corporation shall 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.

EIGHTH: 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 of 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.

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 Title 8 of the Delaware Code 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 Title 8 of the Delaware Code, 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 matter as the said court directs. If a majority in number representing three-fourths (3/4) in value of the creditors or class of creditors, any/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, the said compromise or arrangement and the said reorganization shall, if sanctioned by the court to which the said 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: Subject to the provisions of this Restated Certificate, from time to time any of the provisions of this Restated Certificate may be amended, altered 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 are granted subject to the provisions of this Article.

IN WITNESS WHEREOF, the Corporation has caused this Amended and Restated Certificate of Incorporation to be signed by its duly authorized officer this 16th day of September, 2002.

ASM Scientific, Inc.

By: Catherine Ballist Stempie
Catherine Ballist Stempie
President

AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
ASM SCIENTIFIC, INC.

(Pursuant to Sections 242 and 245 of the
General Corporation Law of the State of Delaware)

ASM Scientific, Inc., a Delaware corporation, hereby certifies as follows:

1. The name of the corporation (hereinafter called the "Corporation") is ASM Scientific, Inc.
2. The date of filing of the Corporation's Certificate of Incorporation with the Secretary of State of the State of Delaware was December 23, 1998. A Restated Certificate of Incorporation was filed on September 17, 2002 (the "Restated Certificate").
3. The Restated Certificate filed September 17, 2002, is hereby amended and restated to among other things, change the name of the Corporation and the capitalization of the Corporation as set forth in the Restated Certificate of Incorporation below.
4. Pursuant to Section 228(a) of the General Corporation Law of the State of Delaware, the holders of outstanding shares of the Corporation having no less than the minimum number of votes that would be necessary to authorize or take such actions at a meeting at which all shares entitled to vote thereon were present and voted, consented to the adoption of the aforesaid amendments without a meeting, without a vote and without prior notice and that written notice of the taking of such actions is being given in accordance with Section 228(e) of the General Corporation Law of the State of Delaware.
5. This Amended and Restated Certificate of Incorporation amends, restates and integrates the provisions of the Restated Certificate of said Corporation filed September 17, 2002 and has been duly adopted in accordance with the provisions of Sections 242 and 245 of the General Corporation Law of the State of Delaware.
6. The text of the Restated Certificate, as amended, shall read in full as follows:

RESTATED CERTIFICATE OF INCORPORATION

OF

TWISTDX, INC.

FIRST: The name of the Corporation is: TwistDx, Inc.

SECOND: The address, including street, number, city and county, of the registered office of the Corporation in the State of Delaware is 2711 Centerville Road, Suite 400, City of Wilmington, County of New Castle and the name of the registered agent of the Corporation at that address is Corporation Service Company.

THIRD: The purpose for which the Corporation is organized 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.

FOURTH: The total number of shares of all classes of capital stock which the Corporation has the authority to issue is 6,000,000 shares, consisting of 5,000,000 shares of common stock, par value \$.01 per share (the "Common Stock"), and 1,000,000 shares of preferred stock, par value \$.01 per share (the "Preferred Stock"), all of which have been designated as Series A Convertible Preferred Stock (the "Series A Preferred").

The following is a statement of the relative powers, designations, preferences, special rights, privileges, qualifications, limitations, restrictions and other matters pertaining to the Common Stock and the Series A Preferred. All cross references in this Article FOURTH refer to other sections or subsections in this Article FOURTH unless otherwise indicated.

A. Common Stock.

1. General. All shares of Common Stock will be identical and will entitle the holders thereof to the same rights and privileges. The voting, dividend, liquidation and other rights of the holders of the Common Stock are subject to, and qualified by, the rights of the holders of the Preferred Stock.

2. Voting Rights. Except as otherwise required by law or this Restated Certificate of Incorporation, as amended from time to time, each holder of Common Stock shall have one vote in respect of each share held by him of record on the books of the Corporation for the election of directors and on all matters submitted to a vote of stockholders of the Corporation. The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares then outstanding) only by the affirmative vote of the holders of at least a majority of the outstanding shares of Common Stock and Preferred Stock voting together as a single class, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law of Delaware. The holders of Common Stock shall have the rights with respect to elections of directors set forth in this Article IV B.3 below. There shall be no cumulative voting.

3. Dividends. Dividends may be declared and paid on the Common Stock from funds lawfully available therefor as and when determined by the Board of Directors in their sole discretion, subject to provisions of law, any provision of the Corporation's Restated Certificate of Incorporation, as amended from time to time, and subject to the relative rights and preferences of any shares of Preferred Stock authorized and issued hereunder.

4. Liquidation Rights. In the event of any liquidation, dissolution or winding up of the affairs of the Corporation, the holders of the Common Stock shall be entitled, subject to the rights and preferences, if any, of any holders of shares of Preferred Stock authorized and issued hereunder, to share, ratably in proportion to the number of shares of Common Stock held by them, in the remaining assets of the Corporation available for distribution to its stockholders.

B. Series A Preferred Stock.

The Series A Preferred shall have the rights, preferences, powers and privileges and the restrictions, qualifications and limitations set forth below:

1. Liquidation Rights.

(a) Treatment at Liquidation, Dissolution or Winding Up. In the event of any liquidation, dissolution or winding up of the affairs of the Corporation, whether voluntary or involuntary, the holders of Series A Preferred shall be entitled to be paid ratably among the holders of Common Stock and the Series A Preferred, with the holders of Series A Preferred deemed to hold that number of shares of Common Stock into which such shares of Series A Preferred are convertible.

(b) Treatment of Reorganizations, Consolidations, Mergers and Sales of Assets. For purposes of this Section 1, a liquidation, dissolution or winding up of the Corporation shall be deemed to be occasioned by, or to include (unless the holders of at least a majority of the Series A Preferred then outstanding shall determine otherwise), (A) the acquisition of this corporation by another entity by means of any transaction or series of related transactions (including, without limitation, any reorganization, merger or consolidation) that results in the transfer of fifty percent (50%) or more of the outstanding voting power of this corporation; or (B) a sale of all or substantially all of the assets of this corporation. The provisions of this Subsection 1(b) shall not apply to any reorganization, merger or consolidation involving (1) only a change in the state of incorporation of the Corporation or (2) a merger of the Corporation with or into a wholly-owned subsidiary of the Corporation which is incorporated in the United States of America.

(c) Distributions other than Cash. Whenever the distribution provided for in this Section 1 shall be payable in property other than cash, the value of such distribution shall be the fair market value of such property as determined in good faith by the Board of Directors of the Corporation.

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

(a) Right to Convert; Conversion Price. Each share of Series A Preferred shall be convertible, without the payment of any additional consideration by the holder thereof and 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 A Preferred, into such number of fully paid and non-assessable shares of Common Stock as is determined by dividing \$0.85 by the Conversion Price, determined as hereinafter provided, in effect at the time of conversion. The Conversion Price for purposes of calculating the number of shares of Common Stock deliverable upon conversion without the payment of any additional consideration by the holder of Series A Preferred (the "Conversion Price") shall initially be \$0.85. Such initial Conversion Price shall be subject to adjustment, in order to adjust the number of shares of Common Stock into which Series A Preferred is convertible, as hereinafter provided in subsection 2(d).

(b) Mechanics of Conversion. Before any holder of Series A Preferred shall be entitled to convert the same into full shares of Common Stock, such holder shall surrender the certificate or certificates therefor, duly endorsed, at the office of the Corporation or of any transfer agent for the Series A Preferred, 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 of such holder or the name or names of the nominees of such holder in which such holder wishes the certificate or certificates for shares of Common Stock to be issued. No fractional shares of Common Stock shall be issued upon conversion of any shares of Series A Preferred. In lieu of any fractional shares of Common Stock to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the then effective Conversion Price. The Corporation shall, as soon as practicable thereafter, issue and deliver at such office to such holder of Series A Preferred, 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, together with cash in lieu of any fraction of a share. 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 A Preferred to be converted, and the person or persons entitled to receive the shares of Common Stock issuable upon conversion shall be treated for all purposes as the record holder or holders of such shares of Common Stock on such date.

(c) Automatic Conversion.

(i) Each share of Series A Preferred shall automatically be converted into shares of Common Stock at the then effective Conversion Price upon:

(A) The closing of a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, covering the offer and sale of Common Stock to the public at a per share purchase price of not less than \$2.55 and with gross proceeds to the sellers of not less than \$15,000,000 (a "Qualified IPO"); or

(B) The written election of the holders of not less than a majority in voting power of the then outstanding shares of Series A Preferred to require such mandatory conversion.

(ii) Upon the occurrence of an event specified in Section 2(c)(i) hereof, all shares of Series A Preferred shall be converted automatically without any further action by any holder of such shares and whether or not the certificate or certificates representing such shares are surrendered to the Corporation or the transfer agent for the Series A Preferred, provided, however, that the Corporation shall not be obligated to issue a

certificate or certificates evidencing the shares of Common Stock into which such shares of Series A Preferred were convertible unless the certificate or certificates representing such shares of Series A Preferred being converted are either delivered to the Corporation or the transfer agent of the Series A Preferred, or the holder notifies the Corporation or such transfer agent that such certificate or certificates have been lost, stolen, or destroyed and executes and delivers an agreement satisfactory to the Corporation to indemnify the Corporation from any loss incurred by it in connection therewith and, if the Corporation so elects, provides an appropriate indemnity.

(iii) Upon the automatic conversion of Series A Preferred, each holder of Series A Preferred shall surrender the certificate or certificates representing such holder's shares of Series A Preferred at the office of the Corporation or of the transfer agent for the Series A Preferred. Thereupon, there shall be issued and delivered to such holder, promptly at such office and in such holder's name as shown on such surrendered certificate or certificates, a certificate or certificates for the number of shares of Common Stock into which the shares of Series A Preferred surrendered were convertible on the date on which such automatic conversion occurred. No fractional shares of Common Stock shall be issued upon the automatic conversion of Series A Preferred. In lieu of any fractional shares of Common Stock to which the holder would otherwise be entitled, the corporation shall pay cash equal to such fraction multiplied by the then effective Conversion Price.

(d) Adjustments to Conversion Price for Diluting Issues.

(i) Special Definitions. For purposes of this Section 2(d), the following definitions shall apply:

(A) "Option" shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

(B) "Original Issue Date" shall mean the date on which shares of Series A Preferred were first issued.

(C) "Convertible Securities" shall mean any evidences of indebtedness, shares (other than Common Stock and Series A Preferred) or other securities directly or indirectly convertible into or exchangeable for Common Stock.

(D) "Additional Shares of Common Stock" shall mean all shares of Common Stock issued (or, pursuant to Section 2(d)(iii), deemed to be issued, collectively referred to in this Section 2 as "Common Stock") by the Corporation after the Original Issue Date, other than the following (collectively, "Excluded Shares"):

(I) shares of Common Stock issued or issuable by reason of a dividend, stock split, conversion or other distribution on shares of the Series A Preferred or, subject to section 2(d)(iii)(B), the Common Stock;

(II) shares of Common Stock issued or issuable to officers, employees or directors of, or consultants to, the Corporation pursuant to the Corporation's 2002 Employee, Director and Consultant Stock Plan or any other plan approved by the Board of Directors;

(III) shares of Common Stock issued in connection with joint ventures, strategic alliances, partnerships, leasing or financing arrangements primarily for non-equity financing purposes approved by the Board of Directors;

(IV) shares of Common Stock issued in connection acquisitions of or by the Corporation whether by merger, consolidation, sale of assets, sale or exchange of stock or otherwise approved by the Board of Directors;

(V) shares of Common Stock issued upon exchange of Convertible Securities approved by the Board of Directors; and

(VI) shares of Common Stock issued in a Qualified IPO.

(ii) No Adjustment of Conversion Price. No adjustment in the number of shares of Common Stock into which a share of Series A Preferred is convertible shall be made by adjustment in the Conversion Price in respect of the issuance of Additional Shares of Common Stock or otherwise unless (i) the consideration per share for an Additional Share of Common Stock issued or deemed to be issued by the Corporation is less than the Conversion Price in effect on the date of, and immediately prior to, the issue of such Additional Shares of Common Stock and (ii) prior to such issuance, the Corporation fails to receive written notice from the holders of at least a majority of the then outstanding shares of Series A Preferred agreeing that no such adjustment shall be made as the result of the issuance of Additional Shares of Common Stock.

(iii) Issue of Securities Deemed Issue of Additional Shares of Common Stock.

(A) Options and Convertible Securities. Except for Options or Convertible Securities that are included in the definition of Excluded Shares, in the event the Corporation at any time after the Original Issue Date shall issue any Options or Convertible Securities or shall fix a record date for the determination of holders of any class of securities entitled to receive any such Options or Convertible Securities, then 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 upon the exercise of such Options or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, shall be deemed to be Additional Shares of Common Stock issued as of the time of such issue or, in case such a record date shall have been fixed, as of the close of business on such record date, provided that Additional Shares of Common Stock shall not be deemed to have been issued unless the consideration per share (determined pursuant to Section 2(d)(v) hereof) of such Additional Shares of

Common Stock would be less than the Conversion Price in effect on the date of and immediately prior to such issue, or such record date, as the case may be, and provided further that in any such case in which Additional Shares of Common Stock are deemed to be issued:

(I) No further adjustment in the Conversion Price shall be made upon the subsequent issue of Convertible Securities or shares of Common Stock upon the exercise of such Options or conversion or exchange of such Convertible Securities;

(II) If such Options or Convertible Securities by their terms provide, with the passage of time or otherwise, for any increase in the consideration payable to the Corporation, or decrease in the number of shares of Common Stock issuable upon the exercise, conversion or exchange thereof, the Conversion Price computed upon the original issue thereof (or upon the occurrence of a record date with respect thereto), and any subsequent adjustments based thereon, shall, upon any such increase or decrease becoming effective, be recomputed to reflect such increase or decrease insofar as it affects such Options or the rights of conversion or exchange under such Convertible Securities;

(III) Upon the expiration of any such options or any rights of conversion or exchange under such Convertible Securities which shall not have been exercised, the Conversion Price computed upon the original issue 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:

(a) In the case of Convertible Securities or Options for Common Stock the only Additional Shares of Common Stock issued were the shares of Common Stock, if any, actually issued upon the exercise of such Options or the conversion or exchange of such Convertible Securities and the consideration received therefor was the consideration actually received by the Corporation for the issue of all such Options, whether or not exercised, plus the consideration actually received by the Corporation upon such exercise, or for the issue of all such Convertible Securities which were actually converted or exchanged, plus the additional consideration, if any, actually received by the Corporation upon such conversion or exchange; and

(b) In the case of Options for Convertible Securities only the Convertible Securities, if any, actually issued upon the exercise thereof were issued at the time of issue of such Options, and the consideration received by the Corporation for the Additional Shares of Common Stock deemed to have been then issued was the consideration actually received by the Corporation for the issue of all

such Options, whether or not exercised, plus the consideration deemed to have been received by the Corporation (determined pursuant to Section 2(d)(v)) upon the issue of the Convertible Securities with respect to which such Options were actually exercised;

(IV) No readjustment pursuant to clause (II) or (III) above shall have the effect of increasing the Conversion Price to an amount which exceeds the lower of (a) the Conversion Price prior to the original adjustment for such deemed issuance, or (b) the Conversion Price that would have resulted from any issuance of Additional Shares of Common Stock between the original adjustment date and such readjustment date;

(V) In the case of any Options which expire by their terms not more than 30 days after the date of issue thereof, no adjustment of the Conversion Price shall be made until the expiration or exercise of all such Options, whereupon such adjustment shall be made in the same manner provided in clause (III) above; and

(VI) If such record date shall have been fixed and such Options or Convertible Securities are not issued on the date fixed therefor, the adjustment previously made in the Conversion Price which became effective on such record date shall be canceled as of the close of business on such record date, and thereafter the Conversion Price shall be adjusted pursuant to this Section 2(d)(iii) as of the actual date of their issuance.

(B) Stock Dividends, Stock Distributions and Subdivisions. In the event the Corporation at any time or from time to time after the Original Issue Date shall declare or pay any dividend or make any other distribution on the Common Stock payable in Common Stock or effect a subdivision of the outstanding shares of Common Stock (by reclassification or otherwise than by payment of a dividend in Common Stock), then and in any such event, Additional Shares of Common Stock shall be deemed to have been issued:

(I) In the case of any such dividend or distribution, immediately after the close of business on the record date for the determination of holders of any class of securities entitled to receive such dividend or distribution, or

(II) In the case of any such subdivision, at the close of business on the date immediately prior to the date upon which corporate action becomes effective.

If such record date shall have been fixed and no part of such dividend shall have been paid on the date fixed therefor, the adjustment previously made for the Conversion Price which became effective on such record date shall be canceled as of the close of business on such record date, and thereafter the Conversion Price shall

be adjusted pursuant to this Section 2(d)(iii) as to the time of actual payment of such dividend.

(iv) Adjustment of Conversion Price Upon Issuance of Additional Shares of Common Stock.

(A) In the event the Corporation shall issue Additional Shares of Common Stock (including, without limitation, Additional Shares of Common Stock deemed to be issued pursuant to Section 2(d)(iii) but excluding Additional Shares of Common Stock deemed to be issued pursuant to Section 2(d)(iii)(B), which event is dealt with in Section 2(d)(vi) hereof), without consideration or for a consideration per share less than the applicable Conversion Price in effect on the date of and immediately prior to such issue, then and in such event, such Conversion Price shall be reduced, concurrently with such issue in order to increase the number of shares of Common Stock into which the Series A Preferred is convertible, to a price (calculated to the nearest cent) determined by multiplying such Conversion Price by a fraction, the numerator of which shall be (I) the number of shares of Common Stock outstanding immediately prior to such issue (including shares of Common Stock underlying any outstanding Option or Convertible Securities) plus (II) the number of shares of Common Stock which the aggregate consideration received or deemed to have been received by the Corporation for the total number of Additional Shares of Common Stock so issued would purchase at such Conversion Price, and the denominator of which shall be (I) the number of shares of Common Stock outstanding immediately prior to such issue (including shares of Common Stock underlying any outstanding Option or Convertible Securities) plus (II) the number of Additional Shares of Common Stock so issued or deemed to be issued.

(B) Notwithstanding anything to the contrary contained herein, the applicable Conversion Price in effect at the time Additional Shares of Common Stock are issued or deemed to be issued shall not be reduced pursuant to Section 2(d)(iv)(A) hereof at such time if the amount of such reduction would be an amount less than \$0.01, but any such amount shall be carried forward and reduction with respect thereto made at the time of and together with any subsequent reduction which, together with such amount and any other amount or amounts so carried forward, shall aggregate \$0.01 or more.

(v) Determination of Consideration. For purposes of this Section 2(d), the consideration received by the Corporation for the issue of any Additional Shares of Common Stock shall be computed as follows:

(A) Cash, Property and Services. Such consideration shall:

(I) Insofar as it consists of cash, be computed at the aggregate amounts of cash received by the Corporation excluding amounts paid or payable for accrued interest or accrued dividends;

(II) Insofar as it consists of property or services other than cash, be computed at the fair market value thereof at the time of such issue, as determined in good faith by the Board of Directors; and

(III) In the event that Additional Shares of Common Stock are issued together with other shares or securities or other assets of the Corporation for consideration which covers both, be the proportion of such consideration so received, computed as provided in clauses (I) and (II) above, as determined in good faith by the Board of Directors.

(B) Options and Convertible Securities. The consideration per share received by the Corporation for Additional Shares of Common Stock deemed to have been issued pursuant to Section 2(d)(iii)(A), relating to Options and Convertible Securities, shall be determined by dividing (I) the total amount, if any, received or receivable by the Corporation as consideration for the issue of such Options or Convertible Securities, plus the minimum aggregate amount of additional consideration (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such consideration) payable to the Corporation upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities, by (II) the maximum number of shares of Common Stock (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or the conversion or exchange of such Convertible Securities.

(vi) Adjustment for Dividends, Distributions, Subdivisions, Combinations or Consolidations of Common Stock.

(A) Stock Dividends, Distributions or Subdivisions. In the event the Corporation shall issue Additional Shares of Common Stock pursuant to Section 2(d)(iii)(B) in a stock dividend, stock distribution or subdivision, the Conversion Price in effect immediately prior to such stock dividend, stock distribution or subdivision shall, concurrently with the effectiveness of such stock dividend, stock distribution or subdivision, be proportionately decreased.

(B) Combinations or Consolidations. In the event the outstanding shares of Common Stock shall be combined or consolidated, by reclassification or otherwise, into a lesser number of shares of Common Stock, the Conversion Price in effect immediately prior to such combination or consolidation shall, concurrently with the effectiveness of such combination or consolidation, be proportionately increased.

(e) No Impairment. The Corporation shall not, by amendment of its Certificate of Incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the

observance or performance of any of the terms to be observed or performed hereunder by the Corporation but shall at all times in good faith assist in the carrying out of all the provisions of this Section 2 and in the taking of all such action as may be necessary or appropriate in order to protect the conversion rights of the holders of Series A Preferred against impairment.

(f) Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of the Conversion Price pursuant to this Section 2, the Corporation at its expense shall promptly compute such adjustment or readjustment in accordance with the terms hereof and furnish to each affected holder of Series A Preferred, 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 affected holder of Series A Preferred furnished to such holder a like certificate setting forth (i) such adjustments and readjustments, (ii) the Conversion Price 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 conversion of each share of Series A Preferred.

(g) 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 determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in previous quarters) or other distribution, the Corporation shall mail to each holder of Series A Preferred at least twenty (20) days prior to such record date a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(h) Common Stock Reserved. The Corporation shall reserve and keep available out of its authorized but unissued Common Stock such number of shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding shares of Series A Preferred; and if at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Series A Preferred Stock, in addition to such other remedies as shall be available to the holder of such 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 purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to this Restated Certificate of Incorporation, as amended from time to time.

(i) Certain Taxes. The Corporation shall pay any issue or transfer taxes payable in connection with the conversion of any shares of Series A Preferred, provided, however, that the Corporation shall not be required to pay any tax which may be payable in respect of any transfer to a name other than that of the holder of such Series A Preferred.

(j) Closing of Books. The corporation shall at no time close its transfer books against the transfer of any Series A Preferred, or of any shares of Common Stock issued or issuable upon the conversion of any shares of Series A Preferred in any manner which interferes with the timely conversion or transfer of such Series A Preferred.

3. Voting Rights; Protective Provisions.

(a) Except as otherwise required by law or this Restated Certificate of Incorporation, as amended from time to time, the holders of Series A Preferred and the holders of Common Stock shall be entitled to notice of any stockholders' meeting and to vote as a single class upon any matter submitted to the stockholders for a vote, on the following basis:

(i) holders of Common Stock shall have one vote per share of Common Stock held by them; and

(ii) holders of Series A Preferred shall have that number of votes per share of Series A Preferred as is equal to the number of shares of Common Stock into which each such share of Series A Preferred held by such holder could be converted on the date for determination of stockholders entitled to vote at the meeting.

(b) As long as at least a majority of shares of Series A Preferred originally issued remain outstanding, at each election of directors the holders of such shares of Series A Preferred shall be entitled to elect one (1) director of the Corporation nominated by the holders of the Series A Preferred (the "Series A Director"). The holders of outstanding Common Stock shall be entitled to elect two (2) directors of the Corporation at each election of directors, one of whom shall be the Corporation's chief executive officer, or if none is so appointed, the President. The holders of Series A Preferred and Common Stock (voting together as a single class) shall be entitled to elect any remaining directors of the Corporation.

In the case of any vacancy (other than a vacancy caused by removal) in the office of a director occurring among the directors elected by the holders of a class or series of stock pursuant to this Section 3(b), the remaining directors so elected by that class or series may by affirmative vote of a majority thereof (or the remaining director so elected if there be but one, or if there are no such directors remaining, by the affirmative vote of the holders of a majority of the shares of that class or series), elect a successor or successors to hold office for the unexpired term of the director or directors whose place or places shall be vacant. Any director who shall have been elected by the holders of a class or series of stock or by any directors so elected as provided in the immediately preceding sentence hereof may be removed during the aforesaid term of office, either with or without cause, by, and only by, the affirmative vote of the holders of the shares of the class or series of stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or pursuant to a written consent of stockholders, and any vacancy thereby created may be filled by the holders of that class or series of stock represented at the meeting or pursuant to unanimous written consent.

(c) Except as expressly provided herein or required by law, for so long as any shares of the Series A Preferred remain outstanding, then without the approval by vote or written consent of the holders of a majority of the then outstanding shares of the Series A Preferred voting as a separate class (each share of the Series A Preferred to be entitled to one vote for each share of the Common Stock into which it is then convertible), the Corporation shall not:

(i) sell, convey, or otherwise dispose of all or substantially all of its property or business or merge into or consolidate with any other corporation (other than a wholly-owned subsidiary corporation) or effect any transaction or series of related transactions if the holders of the equity of the Corporation immediately prior to such transaction will not

own, directly or indirectly, at least fifty percent (50%) of the voting power of the equity of the surviving or successor entity;

(ii) effect, approve, authorize or permit a liquidation, dissolution or winding up of the Corporation;

(iii) amend, alter or repeal any of the provisions of the Certificate of Incorporation or By-Laws or in any way change the preferences, privileges, rights or powers with respect to the Series A Preferred Stock, if any such alteration or change would adversely affect the rights of the holders of the Series A Preferred;

(iv) redeem, purchase, or otherwise acquire for value any shares of the Common Stock, except for the repurchase of options or shares of the Common Stock held by employees, consultants, directors, or officers of the Corporation that are subject to stock repurchase agreements approved by the Board of Directors under which the Corporation has the right to repurchase such options or shares in the event of termination of employment or the termination of the consulting relationship.

(v) declare or distribute any dividend (other than a stock dividend) on any series of capital stock of the Corporation ranking junior to the Series A Preferred with respect to dividends or rights upon liquidation, dissolution, or winding up the Common Stock;

(vi) authorize or issue, or obligate itself to authorize or issue, any other equity security having any preference or priority over, or ranking senior to or on parity with, the Series A Preferred with respect to dividends or rights upon liquidation, dissolution, or winding up; or

(vii) sell, convey, or otherwise dispose of all or substantially all of its intellectual property other than in the ordinary course of business, unless such transaction has been unanimously approved by the Board of Directors.

The holders of the Series A Preferred shall vote as a separate class with respect to any matter or proposed action as to which applicable law or this Restated Certificate of Incorporation, as amended from time to time, require the vote, consent, or approval of the holders of the Series A Preferred voting as a separate class.

4. Dividend Rights. In the event that the Board of Directors of the Corporation shall declare dividends on the Common Stock out of funds legally available therefor, then such dividends shall be declared pro rata on the Common Stock and the Series A Preferred on a pari passu basis according to the number of shares of Common Stock held by the holders of shares of Series A Preferred, where such holder is treated for this purpose as holding the greatest whole number of shares of Common Stock then issuable upon conversion of all shares of Series A Preferred held by such holder pursuant to Section 2 hereof.

5. Redemption of Series A Preferred Stock.

(a) At the Election of Holders of Series A Preferred Stock. At any time on or after the **September 17, 2005**, the holders of a majority of the Series A Preferred may elect to have the Corporation redeem all of the then outstanding shares of Series A Preferred held by such holders at a price per share equal to the Redemption Price set forth in Section 5(c) below by giving a written notice to the Corporation of such election (the "Redemption Notice"), whereupon the Corporation shall immediately provide a written notice of such election to the remaining holders of Series A Preferred that have not provided the Redemption Notice specifying the date on which the redemption of such shares of Series A Preferred shall occur (the "Redemption Date"); such date shall be not less than twenty (20) days nor more than thirty (30) days after the date of the Redemption Notice. Each remaining holder of Series A Preferred may elect to participate in such redemption by providing written notice of such election to the Corporation at any time not more than twenty (20) days after the receipt of such notice from the Corporation. The Corporation shall, unless otherwise prevented by law, redeem from each such electing holder on the Redemption Date all of the shares of Series A Preferred Stock held by such holder.

(b) Redemption Price and Payment. The Series A Preferred to be redeemed on the Redemption Date shall be redeemed by paying for each share an amount in cash equal to \$0.85 per share of Series A Preferred (which amount shall be subject to equitable adjustment whenever there shall occur a stock dividend, distribution, combination of shares, reclassification or other similar event with respect to Series A Preferred) plus all dividends declared but unpaid, computed to the Redemption Date; such amount is referred to as the "Redemption Price."

(c) Redemption Closing. The closing of the Corporation's redemption of the Series A Preferred pursuant to this Section 5 shall take place at 11:00 a.m. Eastern Standard Time on the Redemption Date at the Corporation's principal executive office or other mutually agreed upon location where the closing will occur. At the closing, the Corporation shall pay to each holder of Series A Preferred from whom shares of Series A Preferred are being redeemed an amount equal to the aggregate Redemption Price for all such shares against receipt from such holder of the certificate or certificates, duly endorsed or assigned to the Corporation in blank, representing the shares of Series A Preferred being redeemed. All such payments shall be made by wire transfer of immediately available funds or, if any such holder shall not have specified wire transfer instructions to the Corporation prior to the closing, by certified or official bank check payable to the order of the holder.

(d) Insufficient Funds. If the Corporation shall not be permitted, or shall not have funds legally available in the amount necessary, to redeem all shares of Series A Preferred to be redeemed on the Redemption Date, then the Series A Preferred Stock shall be redeemed by the Corporation on such Redemption Date to the maximum extent the Corporation is permitted and has funds legally available on a pro rata basis, in accordance with the number of shares then owned by each such holder of Series A Preferred. The Corporation shall immediately redeem such shares of Series A Preferred upon the termination of such legal prohibition and at any time thereafter when additional funds of the Corporation are legally available for the redemption of such shares of Series A Preferred, such funds will be used to redeem the balance of such shares, or such portion thereof for which funds are then legally available, on the basis set forth above.

(e) Effect of Redemption. From and after the close of business on the Redemption Date, unless there shall have been a default in the payment of the Redemption Price, all rights (except

the right to receive the Redemption Price) of the holders of Series A Preferred with respect to the shares of Series A Preferred to be redeemed on such date shall cease and terminate, and such shares shall not thereafter be transferred on the books of the Corporation or be deemed to be outstanding for any purpose whatsoever whether or not the certificates representing such shares have been received by the Corporation; provided, however, that, notwithstanding anything contained herein to the contrary, (A) if the Corporation defaults in the payment of the Redemption Price, the rights of such holders with respect to such shares of Series A Preferred shall continue until the Corporation cures such default, and (B) without limiting any other rights of such holders, upon the occurrence of a subsequent liquidation, with respect to the shares of Series A Preferred in respect of which the payment of the Redemption Price has not occurred, such holders shall be accorded the liquidation rights set forth in this Restated Certificate of Incorporation, as amended from time to time, in respect of such remaining shares, as if no prior redemption request had been made. The shares of Series A Preferred not redeemed shall remain outstanding and entitled to all rights and preferences provided herein.

6. No Reissuance of Series A Preferred. No share or shares of Series A Preferred acquired by the Corporation by reason of redemption, purchase, conversion or otherwise shall be reissued, and all such shares shall be canceled, retired and eliminated from the shares which the corporation shall be authorized to issue.

7. Residual Rights. All rights accruing to the outstanding shares of the Corporation not expressly provided for in the terms of the Series A Preferred shall be vested in the Common Stock.

8. Preemptive Rights.

(a) Notice of New Issuance. Except with respect to "Exempt Issuances" as defined in Section 8(c) hereof, in the event that the Corporation plans to issue any (i) shares of Common Stock, (ii) warrants, options or other rights to purchase Common Stock (collectively, "Rights"), or (iii) any debentures or other securities convertible into or exchangeable for shares of Common Stock (collectively, "Convertible Securities"), the Corporation will deliver to the holders of Series A Preferred a notice (the "Offer Notice") of such issuance (the "New Issuance") stating (a) its bona fide intention to offer such shares of Common Stock, Rights or Convertible Securities, (b) the number of such shares of Common Stock, Rights or Convertible Securities to be offered, and (c) the price and terms upon which it proposes to offer such shares of Common Stock, Rights or Convertible Securities.

(b) Right to Purchase Shares, Rights or Convertible Securities. In the event of a New Issuance (other than an Exempt Issuance), as long as at least a majority of shares of Series A Preferred originally issued remain outstanding, then the holders of such shares of Series A Preferred shall have the right to purchase all, but not less than all, of such number of shares of Common Stock, Rights or Convertible Securities at the price and on the terms upon which the New Issuance was made, such price to be paid in full in cash or by check at the time of issuance of such securities to the holders of Series A Preferred so that, after giving effect to the issuance to the holders of Series A Preferred and the conversion, exercise and exchange into or for (whether directly or indirectly) shares of Common Stock of all such Rights and Convertible Securities, each holder of Series A Preferred who exercises such right will continue to maintain its same proportionate ownership of Common Stock as of the date immediately preceding the

New Issuance, treating each holder of Series A Preferred, for the purpose of such computation, as the holder of the number of shares of Common Stock which would be issuable to it upon conversion, exercise and exchange of all Rights and Convertible Securities held by it on the date immediately preceding the New Issuance and assuming the like conversion, exercise and exchange of all such securities held by other persons. The rights set forth in this Section 8 shall be exercised by the holders of Series A Preferred if at all, by written notice to the Corporation delivered not later than ten (10) days after the receipt by the holders of Series A Preferred of the Offer Notice in accordance with the terms and conditions stated therein, and such right shall expire at the end of the ten (10th) day after the day of the receipt by the holders of Series A Preferred of the Offer Notice.

(c) Exempt Issuances. The issuances referred to in Section 8(a) which will not give the holders of Series A Preferred the rights described in Section 8(b) (the "Exempt Issuances") are issuances in which shares of Common Stock or Rights or Convertible Securities of the Corporation are issued or deemed issued (i) as a dividend or distribution payable pro rata to all holders of Common Stock or other securities of the Corporation; (ii) to employees, consultants, officers and directors of the Corporation in the form of Common Stock or options to purchase shares of Common Stock pursuant to the Corporation's 2002 Employee, Director and Consultant Stock Plan or any other equity plan or arrangement for the Corporation's employees, directors and/or consultants approved by the Corporation's Board of Directors; (iii) in connection with the conversion or exercise of any Rights or Convertible Securities; (iv) in connection with joint ventures, strategic alliances, partnerships, leasing or financing arrangements primarily for non-equity financing purposes approved by the Board of Directors; (v) in connection with acquisitions of or by the Corporation whether by merger, consolidation, sale of assets, sale or exchange of stock or otherwise; or (vi) in a Qualified IPO.

FIFTH: The Corporation is to have perpetual existence.

SIXTH: For the management of the business and for the conduct of the affairs of the Corporation, and in further definition and not in limitation of the powers of the Corporation and of its directors and of its stockholders or any class thereof, as the case may be, conferred by the State of Delaware, it is further provided that:

(a) The management of the business and the conduct of the affairs of the Corporation shall be vested in its Board of Directors. Subject to the provisions of this Restated Certificate of Incorporation, as amended from time to time, the number of directors which shall constitute the whole Board of Directors shall be fixed by, or in the manner provided in, the By-Laws. The phrase "whole Board" and the phrase "total number of directors" shall be deemed to have the same meaning, to wit, the total number of directors which the Corporation would have if there were no vacancies. No election of directors need be by written ballot.

(b) After the original or other By-Laws of the Corporation have been adopted, amended or repealed, as the case may be, in accordance with the provisions of Section 109 of the General Corporation Law of the State of Delaware, and, after the Corporation has received any payment for any of its stock, the power to adopt, amend or repeal the By-Laws of the Corporation may be exercised by the Board of Directors of the Corporation.

(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: 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 said section as amended or supplemented (or any successor), provided, however, that except with respect to proceedings to enforce rights to indemnification, the By-Laws of the Corporation may provide that the Corporation shall 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.

EIGHTH: 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 of 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.

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 Title 8 of the Delaware Code 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 Title 8 of the Delaware Code, 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 matter as the said court directs. If a majority in number representing three-fourths (3/4) in value of the creditors or class of creditors, any/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, the said compromise or arrangement and the said reorganization shall, if sanctioned by the court to which the said 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: Subject to the provisions of this Restated Certificate of Incorporation, from time to time any of the provisions of this Restated Certificate may be amended, altered 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 are granted subject to the provisions of this Article.

IN WITNESS WHEREOF, the Corporation has caused this Second Amended and Restated Certificate of Incorporation to be signed by its duly authorized officer this 16th day of April, 2008.

TwistDx, Inc.

By: /s/ Niall A. Armes
Niall A. Armes, President

AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
TWISTDX, INC.

(Pursuant to Sections 242 and 245 of the
General Corporation Law of the State of Delaware)

TwistDx, Inc., a Delaware corporation, hereby certifies as follows:

1. The name of the corporation (hereinafter called the "Corporation") is TwistDx, Inc.
2. The Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on December 23, 1998, under the name "ASM Scientific, Inc." A Restated Certificate of Incorporation was filed on September 17, 2002; and thereafter, a Restated Certificate of Incorporation was filed on April 16, 2008 that changed the name of the Corporation to TwistDx, Inc. (the "Restated Certificate").
3. The Restated Certificate filed April 16, 2008, is hereby amended and restated to, among other things, authorize a new series of preferred stock and to set forth the designations, rights and preferences of such new series of preferred stock, as set forth in the Restated Certificate of Incorporation below.
4. Pursuant to Section 228(a) of the General Corporation Law of the State of Delaware, the holders of outstanding shares of the Corporation having no less than the minimum number of votes that would be necessary to authorize or take such actions at a meeting at which all shares entitled to vote thereon were present and voted, consented to the adoption of the aforesaid amendments without a meeting, without a vote and without prior notice and that written notice of the taking of such actions is being given in accordance with Section 228(e) of the General Corporation Law of the State of Delaware.
5. This Amended and Restated Certificate of Incorporation amends, restates and integrates the provisions of the Restated Certificate of said Corporation filed April 16, 2008, and has been duly adopted in accordance with the provisions of Sections 242 and 245 of the General Corporation Law of the State of Delaware.
6. The text of the Restated Certificate, as amended, shall read in full as follows:

"RESTATED CERTIFICATE OF INCORPORATION

OF

TWISTDX, INC.

FIRST: The name of the Corporation is: TwistDx, Inc.

SECOND: The address, including street, number, city and county, of the registered office of the Corporation in the State of Delaware is 2711 Centerville Road, Suite 400, City of Wilmington, County of New Castle and the name of the registered agent of the Corporation at that address is Corporation Service Company,.

THIRD: The purpose for which the Corporation is organized 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.

FOURTH: The total number of shares of all classes of capital stock which the Corporation has the authority to issue is 6,000,000 shares, consisting of 5,000,000 shares of common stock, par value \$.01 per share (the "Common Stock"), and 1,000,000 shares of preferred stock, par value \$.01 per share (the "Preferred Stock"), of which 647,000 shares have been designated as Series A Convertible Preferred Stock (the "Series A Preferred"), 172,295 shares have been designated as Series A-1 Convertible Preferred Stock (the "Series A-1 Preferred," and together with the Series A Preferred, the "Series A and A-1 Preferred") and the balance of 180,705 shares shall be undesignated Preferred Stock (the "Undesignated Preferred").

The following is a statement of the relative powers, designations, preferences, special rights, privileges, qualifications, limitations, restrictions and other matters pertaining to the Common Stock and the Preferred Stock. All cross references in this Article FOURTH refer to other sections or subsections in this Article FOURTH unless otherwise indicated.

A. Common Stock.

1. General. All shares of Common Stock will be identical and will entitle the holders thereof to the same rights and privileges. The voting, dividend, liquidation and other rights of the holders of the Common Stock are subject to, and qualified by, the rights of the holders of the Preferred Stock.

2. Voting Rights. Except as otherwise required by law or this Restated Certificate of Incorporation, as amended from time to time, each holder of Common Stock shall have one vote in respect of each share held by him of record on the books of the Corporation for the election of directors and on all matters submitted to a vote of stockholders of the Corporation. The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares then outstanding) only by the affirmative vote of the holders of at least a majority of the outstanding shares of Common Stock and Preferred Stock voting together as a single class, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law of Delaware. The holders of Common Stock shall have the rights with respect to elections of directors set forth in this Article IV B.3 below. There shall be no cumulative voting.

3. Dividends. Dividends may be declared and paid on the Common Stock from funds lawfully available therefor as and when determined by the Board of Directors in their sole discretion, subject to provisions of law, any provision of the Corporation's Restated Certificate of Incorporation, as amended from time to time, and subject to the relative rights and preferences of any shares of Preferred Stock authorized and issued hereunder.

4. Liquidation Rights. In the event of any liquidation, dissolution or winding up of the affairs of the Corporation, the holders of the Common Stock shall be entitled, subject to the rights and preferences, if any, of any holders of shares of Preferred Stock authorized and issued hereunder, to share, ratably in proportion to the number of shares of Common Stock held by them, in the remaining assets of the Corporation available for distribution to its stockholders.

B. Series A and A-1 Preferred.

The Series A and A-1 Preferred shall have the rights, preferences, powers and privileges and the restrictions, qualifications and limitations set forth below:

1. Liquidation Rights.

(a) Treatment at Liquidation, Dissolution or Winding Up. In the event of any liquidation, dissolution or winding up of the affairs of the Corporation, whether voluntary or involuntary, the holders of Series A and A-1 Preferred shall be entitled to be paid ratably among the holders of Common Stock and all series of the Series A and A-1 Preferred, with the holders of Series A and A-1 Preferred deemed to hold that number of shares of Common Stock into which such shares of Series A and A-1 Preferred are convertible.

(b) Treatment of Reorganizations, Consolidations, Mergers and Sales of Assets. For purposes of this Section 1, a liquidation, dissolution or winding up of the Corporation shall be deemed to be occasioned by, or to include (unless the holders of at least a majority of the Series A and A-1 Preferred then outstanding shall determine otherwise, voting together as a single class on an as-converted basis) (A) the acquisition of this corporation by another entity by means of any transaction or series of related transactions (including, without limitation, any reorganization, merger or consolidation) that results in the transfer of fifty percent (50%) or more of the outstanding voting power of this Corporation; or (B) a sale of all or substantially all of the assets of this Corporation. The provisions of this Subsection 1(b) shall not apply to any reorganization, merger or consolidation involving (1) only a change in the state of incorporation of the Corporation or (2) a merger of the Corporation with or into a wholly-owned subsidiary of the Corporation.

(c) Distributions other than Cash. Whenever the distribution provided for in this Section 1 shall be payable in property other than cash, the value of such distribution shall be the fair market value of such property as determined in good faith by the Board of Directors of the Corporation.

2. Conversion. The holders of Series A and A-1 Preferred shall have conversion rights as follows (the "Conversion Rights"):

(a) Right to Convert; Conversion Price.

(i) Each share of Series A Preferred shall be convertible, without the payment of any additional consideration by the holder thereof and 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 A Preferred, into such number of fully paid and non-assessable shares of Common Stock as is determined by dividing \$0.85 by the Series A Preferred Conversion Price, determined as hereinafter provided, in effect at the time of conversion. The Series A Preferred Conversion Price for purposes of calculating the number of shares of Common Stock deliverable upon conversion without the payment of any additional consideration by the holder of Series A Preferred (the "Series A Preferred Conversion Price") shall initially be \$0.85. Such initial Series A Preferred Conversion Price shall be subject to adjustment, in order to adjust the number of shares of Common Stock into which Series A Preferred is convertible, as hereinafter provided in subsection 2(d).

(ii) Each share of Series A-1 Preferred shall be convertible, without the payment of any additional consideration by the holder thereof and 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 A-1 Preferred, into such number of fully paid and non-assessable shares of Common Stock as is determined by dividing \$1.67 by the Series A-1 Preferred Conversion Price, determined as hereinafter provided, in effect at the time of conversion. The Series A-1 Preferred Conversion Price for purposes of calculating the number of shares of Common Stock deliverable upon conversion without the payment of any additional consideration by the holder of Series A-1 Preferred (the "Series A-1 Preferred Conversion Price") shall initially be \$1.67. Such initial Series A-1 Preferred Conversion Price shall be subject to adjustment, in order to adjust the number of shares of Common Stock into which Series A-1 Preferred is convertible, as hereinafter provided in subsection 2(d).

As used in this Restated Certificate, the term "Conversion Price" shall mean the Series A Preferred Conversion Price with respect to the Series A Preferred and the Series A-1 Preferred Conversion Price with respect to the Series A-1 Preferred, respectively.

(b) Mechanics of Conversion. Before any holder of Series A and A-1 Preferred shall be entitled to convert the same into full shares of Common Stock, such holder shall surrender the certificate or certificates therefor, duly endorsed, at the office of the Corporation or of any transfer agent for the Series A and A-1 Preferred, 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 of such holder or the name or names of the nominees of such holder in which such holder wishes the certificate or certificates for shares of Common Stock to be issued. No fractional shares of Common Stock shall be issued upon conversion of any shares of Series A and A-1 Preferred. In lieu of any fractional shares of Common Stock to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the then effective Conversion Price. The Corporation shall, as soon as practicable thereafter, issue and deliver at such office to such holder of Series A and A-1 Preferred, 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, together

with cash in lieu of any fraction of a share. 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 A and A-1 Preferred to be converted, and the person or persons entitled to receive the shares of Common Stock issuable upon conversion shall be treated for all purposes as the record holder or holders of such shares of Common Stock on such date.

(c) Automatic Conversion.

(i) Each share of Series A and A-1 Preferred shall automatically be converted into shares of Common Stock at the then effective Conversion Price upon:

(A) The closing of a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, covering the offer and sale of Common Stock to the public at a per share purchase price of not less than \$2.55 and with gross proceeds to the sellers of not less than \$15,000,000 (a "Qualified IPO"); or

(B) The written election of the holders of not less than a majority in voting power of the then outstanding shares of Series A and A-1 Preferred, voting together as a single class on an as-converted basis, to require such mandatory conversion.

(ii) Upon the occurrence of an event specified in Section 2(c)(i) hereof, all shares of Series A and A-1 Preferred shall be converted automatically without any further action by any holder of such shares and whether or not the certificate or certificates representing such shares are surrendered to the Corporation or the transfer agent for the Series A and A-1 Preferred, provided, however, that the Corporation shall not be obligated to issue a certificate or certificates evidencing the shares of Common Stock into which such shares of Series A and A-1 Preferred were convertible unless the certificate or certificates representing such shares of Series A and A-1 Preferred being converted are either delivered to the Corporation or the transfer agent of the Series A and A-1 Preferred, or the holder notifies the Corporation or such transfer agent that such certificate or certificates have been lost, stolen, or destroyed and executes and delivers an agreement satisfactory to the Corporation to indemnify the Corporation from any loss incurred by it in connection therewith and, if the Corporation so elects, provides an appropriate indemnity.

(iii) Upon the automatic conversion of Series A and A-1 Preferred, each holder of Series A and A-1 Preferred shall surrender the certificate or certificates representing such holder's shares of Series A and A-1 Preferred at the office of the Corporation or of the transfer agent for the Series A and A-1 Preferred. Thereupon, there shall be issued and delivered to such holder, promptly at such office and in such holder's name as shown on such surrendered certificate or certificates, a certificate or certificates for the number of shares of Common Stock into which the shares of Series A and A-1 Preferred surrendered were convertible on the date on which such automatic conversion occurred. No fractional shares of Common Stock shall be issued upon the automatic conversion of Series A and A-1 Preferred. In lieu of any fractional shares of Common Stock to which

the holder would otherwise be entitled, the corporation shall pay cash equal to such fraction multiplied by the then effective Conversion Price.

(d) Adjustments to Conversion Price for Diluting Issues.

(i) Special Definitions. For purposes of this Section 2(d), the following definitions shall apply:

(A) "Option" shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

(B) "Original Issue Date" shall mean the date on which shares of such series of Series A and A-1 Preferred were first issued.

(C) "Convertible Securities" shall mean any evidences of indebtedness, shares (other than Common Stock and Series A and A-1 Preferred) or other securities directly or indirectly convertible into or exchangeable for Common Stock.

(D) "Additional Shares of Common Stock" shall mean all shares of Common Stock issued (or, pursuant to Section 2(d)(iii), deemed to be issued, collectively referred to in this Section 2 as "Common Stock") by the Corporation after the Original Issue Date, other than the following (collectively, "Excluded Shares"):

(I) shares of Common Stock issued or issuable by reason of a dividend, stock split, conversion or other distribution on shares of the Series A and A-1 Preferred or, subject to section 2(d)(iii)(B), the Common Stock;

(II) shares of Common Stock issued or issuable to officers, employees or directors of, or consultants to, the Corporation pursuant to the Corporation's 2002 Employee, Director and Consultant Stock Plan or any other equity plan or arrangement for the Corporation's employees, directors and/or consultants approved by the Corporation's Board of Directors;

(III) shares of Common Stock issued or issuable in connection with joint ventures, strategic alliances, partnerships, leasing or financing arrangements primarily for non-equity financing purposes approved by the Board of Directors;

(IV) shares of Common Stock issued or issuable in connection with acquisitions of or by the Corporation whether by merger, consolidation, sale of assets, sale or exchange of stock or otherwise approved by the Board of Directors;

(V) shares of Common Stock issued upon exchange of Convertible Securities approved by the Board of Directors; and

(VI) shares of Common Stock issued in a Qualified IPO.

(ii) No Adjustment of Conversion Price. No adjustment in the number of shares of Common Stock into which a share of Series A and A-1 Preferred is convertible shall be made by adjustment in the Conversion Price in respect of the issuance of Additional Shares of Common Stock or otherwise unless (i) the consideration per share for an Additional Share of Common Stock issued or deemed to be issued by the Corporation is less than the Conversion Price in effect on the date of, and immediately prior to, the issue of such Additional Shares of Common Stock and (ii) prior to such issuance, the Corporation fails to receive written notice from the holders of at least a majority of the then outstanding shares of Series A and A-1 Preferred, voting together as a single class on an as-converted basis, agreeing that no such adjustment shall be made as the result of the issuance of Additional Shares of Common Stock.

(iii) Issue of Securities Deemed Issue of Additional Shares of Common Stock.

(A) Options and Convertible Securities. Except for Options or Convertible Securities that are included in the definition of Excluded Shares, in the event the Corporation at any time after the Original Issue Date shall issue any Options or Convertible Securities or shall fix a record date for the determination of holders of any class of securities entitled to receive any such Options or Convertible Securities, then 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 upon the exercise of such Options or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, shall be deemed to be Additional Shares of Common Stock issued as of the time of such issue or, in case such a record date shall have been fixed, as of the close of business on such record date, provided that Additional Shares of Common Stock shall not be deemed to have been issued unless the consideration per share (determined pursuant to Section 2(d)(v) hereof) of such Additional Shares of Common Stock would be less than the Conversion Price in effect on the date of and immediately prior to such issue, or such record date, as the case may be, and provided further that in any such case in which Additional Shares of Common Stock are deemed to be issued:

(I) No further adjustment in the Conversion Price shall be made upon the subsequent issue of Convertible Securities or shares of Common Stock upon the exercise of such Options or conversion or exchange of such Convertible Securities;

(II) If such Options or Convertible Securities by their terms provide, with the passage of time or otherwise, for any increase in the consideration payable to the Corporation, or decrease in the number of

shares of Common Stock issuable upon the exercise, conversion or exchange thereof, the Conversion Price computed upon the original issue thereof (or upon the occurrence of a record date with respect thereto), and any subsequent adjustments based thereon, shall, upon any such increase or decrease becoming effective, be recomputed to reflect such increase or decrease insofar as it affects such Options or the rights of conversion or exchange under such Convertible Securities;

(III) Upon the expiration of any such options or any rights of conversion or exchange under such Convertible Securities which shall not have been exercised, the Conversion Price computed upon the original issue 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:

(a) In the case of Convertible Securities or Options for Common Stock the only Additional Shares of Common Stock issued were the shares of Common Stock, if any, actually issued upon the exercise of such Options or the conversion or exchange of such Convertible Securities and the consideration received therefor was the consideration actually received by the Corporation for the issue of all such Options, whether or not exercised, plus the consideration actually received by the Corporation upon such exercise, or for the issue of all such Convertible Securities which were actually converted or exchanged, plus the additional consideration, if any, actually received by the Corporation upon such conversion or exchange; and

(b) In the case of Options for Convertible Securities only the Convertible Securities, if any, actually issued upon the exercise thereof were issued at the time of issue of such Options, and the consideration received by the Corporation for the Additional Shares of Common Stock deemed to have been then issued was the consideration actually received by the Corporation for the issue of all such Options, whether or not exercised, plus the consideration deemed to have been received by the Corporation (determined pursuant to Section 2(d)(v)) upon the issue of the Convertible Securities with respect to which such Options were actually exercised;

(IV) No readjustment pursuant to clause (II) or (III) above shall have the effect of increasing the Conversion Price to an amount which exceeds the lower of (a) the Conversion Price prior to the original adjustment for such deemed issuance, or (b) the Conversion Price that would have resulted from any issuance of Additional Shares of Common Stock between the original adjustment date and such readjustment date;

(V) In the case of any Options which expire by their terms not more than 30 days after the date of issue thereof, no adjustment of the Conversion Price shall be made until the expiration or exercise of all such Options, whereupon such adjustment shall be made in the same manner provided in clause (III) above; and

(VI) If such record date shall have been fixed and such Options or Convertible Securities are not issued on the date fixed therefor, the adjustment previously made in the Conversion Price which became effective on such record date shall be canceled as of the close of business on such record date, and thereafter the Conversion Price shall be adjusted pursuant to this Section 2(d)(iii) as of the actual date of their issuance.

(B) Stock Dividends, Stock Distributions and Subdivisions. In the event the Corporation at any time or from time to time after the Original Issue Date shall declare or pay any dividend or make any other distribution on the Common Stock payable in Common Stock or effect a subdivision of the outstanding shares of Common Stock (by reclassification or otherwise than by payment of a dividend in Common Stock), then and in any such event, Additional Shares of Common Stock shall be deemed to have been issued:

(I) In the case of any such dividend or distribution, immediately after the close of business on the record date for the determination of holders of any class of securities entitled to receive such dividend or distribution, or

(II) In the case of any such subdivision, at the close of business on the date immediately prior to the date upon which corporate action becomes effective.

If such record date shall have been fixed and no part of such dividend shall have been paid on the date fixed therefor, the adjustment previously made for the Conversion Price which became effective on such record date shall be canceled as of the close of business on such record date, and thereafter the Conversion Price shall be adjusted pursuant to this Section 2(d)(iii) as to the time of actual payment of such dividend.

(iv) Adjustment of Conversion Price Upon Issuance of Additional Shares of Common Stock.

(A) In the event the Corporation shall issue Additional Shares of Common Stock (including, without limitation, Additional Shares of Common Stock deemed to be issued pursuant to Section 2(d)(iii) but excluding Additional Shares of Common Stock deemed to be issued pursuant to Section 2(d)(iii)(B), which event is dealt with in Section 2(d)(vi) hereof), without consideration or for a consideration per share less than the applicable Conversion Price in effect on the date of and immediately prior to such issue, then and in such event, such

Conversion Price shall be reduced, concurrently with such issue in order to increase the number of shares of Common Stock into which the Series A and A-1 Preferred is convertible, to a price (calculated to the nearest cent) determined by multiplying such Conversion Price by a fraction, the numerator of which shall be (I) the number of shares of Common Stock outstanding immediately prior to such issue (including shares of Common Stock underlying any outstanding Option or Convertible Securities) plus (II) the number of shares of Common Stock which the aggregate consideration received or deemed to have been received by the Corporation for the total number of Additional Shares of Common Stock so issued would purchase at such Conversion Price, and the denominator of which shall be (I) the number of shares of Common Stock outstanding immediately prior to such issue (including shares of Common Stock underlying any outstanding Option or Convertible Securities) plus (II) the number of Additional Shares of Common Stock so issued or deemed to be issued.

(B) Notwithstanding anything to the contrary contained herein, the applicable Conversion Price in effect at the time Additional Shares of Common Stock are issued or deemed to be issued shall not be reduced pursuant to Section 2(d)(iv)(A) hereof at such time if the amount of such reduction would be an amount less than \$0.01, but any such amount shall be carried forward and reduction with respect thereto made at the time of and together with any subsequent reduction which, together with such amount and any other amount or amounts so carried forward, shall aggregate \$0.01 or more.

(v) Determination of Consideration. For purposes of this Section 2(d), the consideration received by the Corporation for the issue of any Additional Shares of Common Stock shall be computed as follows:

(A) Cash, Property and Services. Such consideration shall:

(I) Insofar as it consists of cash, be computed at the aggregate amounts of cash received by the Corporation excluding amounts paid or payable for accrued interest or accrued dividends;

(II) Insofar as it consists of property or services other than cash, be computed at the fair market value thereof at the time of such issue, as determined in good faith by the Board of Directors; and

(III) In the event that Additional Shares of Common Stock are issued together with other shares or securities or other assets of the Corporation for consideration which covers both, be the proportion of such consideration so received, computed as provided in clauses (I) and (II) above, as determined in good faith by the Board of Directors.

(B) Options and Convertible Securities. The consideration per share received by the Corporation for Additional Shares of Common Stock deemed to have been issued pursuant to Section 2(d)(iii)(A), relating to Options and

Convertible Securities, shall be determined by dividing (I) the total amount, if any, received or receivable by the Corporation as consideration for the issue of such Options or Convertible Securities, plus the minimum aggregate amount of additional consideration (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such consideration) payable to the Corporation upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities, by (II) the maximum number of shares of Common Stock (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or the conversion or exchange of such Convertible Securities.

(vi) Adjustment for Dividends, Distributions, Subdivisions, Combinations or Consolidations of Common Stock.

(A) Stock Dividends, Distributions or Subdivisions. In the event the Corporation shall issue Additional Shares of Common Stock pursuant to Section 2(d)(iii)(B) in a stock dividend, stock distribution or subdivision, the Conversion Price in effect immediately prior to such stock dividend, stock distribution or subdivision shall, concurrently with the effectiveness of such stock dividend, stock distribution or subdivision, be proportionately decreased.

(B) Combinations or Consolidations. In the event the outstanding shares of Common Stock shall be combined or consolidated, by reclassification or otherwise, into a lesser number of shares of Common Stock, the Conversion Price in effect immediately prior to such combination or consolidation shall, concurrently with the effectiveness of such combination or consolidation, be proportionately increased.

(e) No Impairment. The Corporation shall not, by amendment of its Certificate of Incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms to be observed or performed hereunder by the Corporation but shall at all times in good faith assist in the carrying out of all the provisions of this Section 2 and in the taking of all such action as may be necessary or appropriate in order to protect the conversion rights of the holders of Series A and A-1 Preferred against impairment.

(f) Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of the Conversion Price pursuant to this Section 2, the Corporation at its expense shall promptly compute such adjustment or readjustment in accordance with the terms hereof and furnish to each affected holder of Series A and A-1 Preferred, 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 affected holder of Series A and A-1 Preferred furnished to such holder a like certificate setting forth (i) such adjustments and readjustments, (ii) the Conversion Price 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 conversion of each share of Series A and A-1 Preferred.

(g) 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 determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in previous quarters) or other distribution, the Corporation shall mail to each holder of Series A and A-1 Preferred at least twenty (20) days prior to such record date a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(h) Common Stock Reserved. The Corporation shall reserve and keep available out of its authorized but unissued Common Stock such number of shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding shares of Series A and A-1 Preferred; and if at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Series A and A-1 Preferred, in addition to such other remedies as shall be available to the holder of such Series A and A-1 Preferred, 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 purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to this Restated Certificate of Incorporation, as amended from time to time.

(i) Certain Taxes. The Corporation shall pay any issue or transfer taxes payable in connection with the conversion of any shares of Series A and A-1 Preferred, provided, however, that the Corporation shall not be required to pay any tax which may be payable in respect of any transfer to a name other than that of the holder of such Series A and A-1 Preferred.

(j) Closing of Books. The corporation shall at no time close its transfer books against the transfer of any Series A and A-1 Preferred, or of any shares of Common Stock issued or issuable upon the conversion of any shares of Series A and A-1 Preferred in any manner which interferes with the timely conversion or transfer of such Series A and A-1 Preferred.

3. Voting Rights; Protective Provisions.

(a) Except as otherwise required by law or this Restated Certificate of Incorporation, as amended from time to time, the holders of Series A and A-1 Preferred and the holders of Common Stock shall be entitled to notice of any stockholders' meeting and to vote as a single class upon any matter submitted to the stockholders for a vote, on the following basis:

(i) holders of Common Stock shall have one vote per share of Common Stock held by them; and

(ii) holders of Series A and A-1 Preferred shall have that number of votes per share of Series A and A-1 Preferred as is equal to the number of shares of Common Stock into which each such share of Series A and A-1 Preferred held by such holder could be converted on the date for determination of stockholders entitled to vote at the meeting.

(b) As long as at least a majority of shares of Series A and A-1 Preferred originally issued remain outstanding, at each election of directors the holders of such shares of Series A and A-1 Preferred, voting together as a single class on an as-converted basis, shall be entitled to elect one (1) director of the Corporation nominated by the holders of the Series A and A-1 Preferred (the "Series A and A-1 Preferred Director"). The holders of outstanding Common Stock shall be entitled to elect two (2) directors of the Corporation at each election of directors, one of whom shall be the Corporation's chief executive officer, or if none is so appointed, the President. The holders of Series A and A-1 Preferred and Common Stock (voting together as a single class) shall be entitled to elect any remaining directors of the Corporation.

In the case of any vacancy (other than a vacancy caused by removal) in the office of a director occurring among the directors elected by the holders of a class or series of stock pursuant to this Section 3(b), the remaining directors so elected by that class or series may by affirmative vote of a majority thereof (or the remaining director so elected if there be but one, or if there are no such directors remaining, by the affirmative vote of the holders of a majority of the shares of that class or series), elect a successor or successors to hold office for the unexpired term of the director or directors whose place or places shall be vacant. Any director who shall have been elected by the holders of a class or series of stock or by any directors so elected as provided in the immediately preceding sentence hereof may be removed during the aforesaid term of office, either with or without cause, by, and only by, the affirmative vote of the holders of the shares of the class or series of stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or pursuant to a written consent of stockholders, and any vacancy thereby created may be filled by the holders of that class or series of stock represented at the meeting or pursuant to unanimous written consent.

(c) Except as expressly provided herein or required by law, for so long as any shares of the Series A and A-1 Preferred remain outstanding, then without the approval by vote or written consent of the holders of a majority of the then outstanding shares of the Series A and A-1 Preferred, voting together as a single class on an as-converted basis, the Corporation shall not:

(i) sell, convey, or otherwise dispose of all or substantially all of its property or business or merge into or consolidate with any other corporation (other than a wholly-owned subsidiary corporation) or effect any transaction or series of related transactions if the holders of the equity of the Corporation immediately prior to such transaction will not own, directly or indirectly, at least fifty percent (50%) of the voting power of the equity of the surviving or successor entity;

(ii) effect, approve, authorize or permit a liquidation, dissolution or winding up of the Corporation;

(iii) amend, alter or repeal any of the provisions of the Certificate of Incorporation or By-Laws or in any way change the preferences, privileges, rights or powers with respect to the Series A and A-1 Preferred, if any such alteration or change would adversely affect the rights of the holders of the Series A and A-1 Preferred;

(iv) redeem, purchase, or otherwise acquire for value any shares of the Common Stock, except for the repurchase of options or shares of the Common Stock held

by employees, consultants, directors, or officers of the Corporation that are subject to stock repurchase agreements approved by the Board of Directors under which the Corporation has the right to repurchase such options or shares in the event of termination of employment or the termination of the consulting relationship.

(v) declare or distribute any dividend (other than a stock dividend) on any series of capital stock of the Corporation ranking junior to the Series A and A-1 Preferred with respect to dividends or rights upon liquidation, dissolution, or winding up the Common Stock;

(vi) authorize or issue, or obligate itself to authorize or issue, any other equity security having any preference or priority over, or ranking senior to or on parity with, the Series A and A-1 Preferred with respect to dividends or rights upon liquidation, dissolution, or winding up; or

(vii) sell, convey, or otherwise dispose of all or substantially all of its intellectual property other than in the ordinary course of business, unless such transaction has been approved by the Board of Directors, including the Series A and A-1 Preferred Director.

The holders of the Series A and A-1 Preferred shall vote as a separate class on an as-converted basis with respect to any matter or proposed action as to which applicable law or this Restated Certificate of Incorporation, as amended from time to time, require the vote, consent, or approval of the holders of the Series A and A-1 Preferred voting as a separate class.

4. Dividend Rights. In the event that the Board of Directors of the Corporation shall declare dividends on the Common Stock out of funds legally available therefor, then such dividends shall be declared pro rata on the Common Stock and the Series A and A-1 Preferred on a pari passu basis according to the number of shares of Common Stock held by the holders of shares of Series A and A-1 Preferred, where such holder is treated for this purpose as holding the greatest whole number of shares of Common Stock then issuable upon conversion of all shares of Series A and A-1 Preferred held by such holder pursuant to Section 2 hereof.

5. Redemption of Series A and A-1 Preferred.

(a) At the Election of Holders of Series A and A-1 Preferred. At any time on or after the **September 17, 2005**, the holders of a majority of the Series A and A-1 Preferred, voting together as a single class on an as-converted basis, may elect to have the Corporation redeem all of the then outstanding shares of Series A and A-1 Preferred held by such holders at a price per share equal to the Redemption Price set forth in Section 5(c) below by giving a written notice to the Corporation of such election (the "Redemption Notice"), whereupon the Corporation shall immediately provide a written notice of such election to the remaining holders of Series A and A-1 Preferred that have not provided the Redemption Notice specifying the date on which the redemption of such shares of Series A and A-1 Preferred shall occur (the "Redemption Date"); such date shall be not less than twenty (20) days nor more than thirty (30) days after the date of the Redemption Notice. Each remaining holder of Series A and A-1 Preferred may elect to participate in such redemption by providing written notice of such election to the Corporation at

any time not more than twenty (20) days after the receipt of such notice from the Corporation. The Corporation shall, unless otherwise prevented by law, redeem from each such electing holder on the Redemption Date all of the shares of Series A and A-1 Preferred held by such holder.

(b) Redemption Price and Payment. The Series A and A-1 Preferred to be redeemed on the Redemption Date shall be redeemed by paying for each share an amount in cash equal to \$0.85 per share of Series A Preferred and \$1.67 per share of Series A-1 Preferred (which amounts shall be subject to equitable adjustment whenever there shall occur a stock dividend, distribution, combination of shares, reclassification or other similar event with respect to Series A and A-1 Preferred) plus all dividends declared but unpaid, computed to the Redemption Date; such amount is referred to as the "Redemption Price."

(c) Redemption Closing. The closing of the Corporation's redemption of the Series A and A-1 Preferred pursuant to this Section 5 shall take place at 11:00 a.m. Eastern Time on the Redemption Date at the Corporation's principal executive office or other mutually agreed upon location where the closing will occur. At the closing, the Corporation shall pay to each holder of Series A and A-1 Preferred from whom shares of Series A and A-1 Preferred are being redeemed an amount equal to the aggregate Redemption Price for all such shares against receipt from such holder of the certificate or certificates, duly endorsed or assigned to the Corporation in blank, representing the shares of Series A and A-1 Preferred being redeemed. All such payments shall be made by wire transfer of immediately available funds or, if any such holder shall not have specified wire transfer instructions to the Corporation prior to the closing, by certified or official bank check payable to the order of the holder.

(d) Insufficient Funds. If the Corporation shall not be permitted, or shall not have funds legally available in the amount necessary, to redeem all shares of Series A and A-1 Preferred to be redeemed on the Redemption Date, then the Series A and A-1 Preferred shall be redeemed by the Corporation on such Redemption Date to the maximum extent the Corporation is permitted and has funds legally available on a pro rata basis, in accordance with the number of shares then owned by each such holder of Series A and A-1 Preferred. The Corporation shall immediately redeem such shares of Series A and A-1 Preferred upon the termination of such legal prohibition and at any time thereafter when additional funds of the Corporation are legally available for the redemption of such shares of Series A and A-1 Preferred, such funds will be used to redeem the balance of such shares, or such portion thereof for which funds are then legally available, on the basis set forth above.

(e) Effect of Redemption. From and after the close of business on the Redemption Date, unless there shall have been a default in the payment of the Redemption Price, all rights (except the right to receive the Redemption Price) of the holders of Series A and A-1 Preferred with respect to the shares of Series A and A-1 Preferred to be redeemed on such date shall cease and terminate, and such shares shall not thereafter be transferred on the books of the Corporation or be deemed to be outstanding for any purpose whatsoever whether or not the certificates representing such shares have been received by the Corporation; provided, however, that, notwithstanding anything contained herein to the contrary, (A) if the Corporation defaults in the payment of the Redemption Price, the rights of such holders with respect to such shares of Series A and A-1 Preferred shall continue until the Corporation cures such default, and (B) without

limiting any other rights of such holders, upon the occurrence of a subsequent liquidation, with respect to the shares of Series A and A-1 Preferred in respect of which the payment of the Redemption Price has not occurred, such holders shall be accorded the liquidation rights set forth in this Restated Certificate of Incorporation, as amended from time to time, in respect of such remaining shares, as if no prior redemption request had been made. The shares of Series A and A-1 Preferred not redeemed shall remain outstanding and entitled to all rights and preferences provided herein.

6. No Reissuance of Series A and A-1 Preferred. No share or shares of Series A and A-1 Preferred acquired by the Corporation by reason of redemption, purchase, conversion or otherwise shall be reissued, and all such shares shall be canceled, retired and eliminated from the shares which the corporation shall be authorized to issue.

7. Residual Rights. All rights accruing to the outstanding shares of the Corporation not expressly provided for in the terms of the Series A and A-1 Preferred shall be vested in the Common Stock.

8. Preemptive Rights.

(a) Notice of New Issuance. Except with respect to "Exempt Issuances" as defined in Section 8(c) hereof, in the event that the Corporation plans to issue any (i) shares of Common Stock, (ii) warrants, options or other rights to purchase Common Stock (collectively, "Rights"), or (iii) any debentures or other securities convertible into or exchangeable for shares of Common Stock (collectively, "Convertible Securities"), the Corporation will deliver to the holders of Series A and A-1 Preferred a notice (the "Offer Notice") of such issuance (the "New Issuance") stating (a) its bona fide intention to offer such shares of Common Stock, Rights or Convertible Securities, (b) the number of such shares of Common Stock, Rights or Convertible Securities to be offered, and (c) the price and terms upon which it proposes to offer such shares of Common Stock, Rights or Convertible Securities.

(b) Right to Purchase Shares, Rights or Convertible Securities. In the event of a New Issuance (other than an Exempt Issuance), as long as at least a majority of shares of Series A and A-1 Preferred originally issued remain outstanding, then the holders of such shares of Series A and A-1 Preferred shall have the right to purchase all, but not less than all, of such number of shares of Common Stock, Rights or Convertible Securities at the price and on the terms upon which the New Issuance was made, such price to be paid in full in cash or by check at the time of issuance of such securities to the holders of Series A and A-1 Preferred so that, after giving effect to the issuance to the holders of Series A and A-1 Preferred and the conversion, exercise and exchange into or for (whether directly or indirectly) shares of Common Stock of all such Rights and Convertible Securities, each holder of Series A and A-1 Preferred who exercises such right will continue to maintain its same proportionate ownership of Common Stock as of the date immediately preceding the New Issuance, treating each holder of Series A and A-1 Preferred, for the purpose of such computation, as the holder of the number of shares of Common Stock which would be issuable to it upon conversion, exercise and exchange of all Rights and Convertible Securities held by it on the date immediately preceding the New Issuance and assuming the like conversion, exercise and exchange of all such securities held by other persons. The rights set forth in this Section 8 shall be exercised by the holders of Series A and A-1 Preferred if at all, by

written notice to the Corporation delivered not later than ten (10) days after the receipt by the holders of Series A and A-1 Preferred of the Offer Notice in accordance with the terms and conditions stated therein, and such right shall expire at the end of the ten (10th) day after the day of the receipt by the holders of Series A and A-1 Preferred of the Offer Notice.

(c) Exempt Issuances. The issuances referred to in Section 8(a) which will not give the holders of Series A and A-1 Preferred the rights described in Section 8(b) (the "Exempt Issuances") are issuances in which shares of Common Stock or Rights or Convertible Securities of the Corporation are issued or deemed issued (i) as a dividend or distribution payable pro rata to all holders of Common Stock or other securities of the Corporation; (ii) to employees, consultants, officers and directors of the Corporation in the form of Common Stock or options to purchase shares of Common Stock pursuant to the Corporation's 2002 Employee, Director and Consultant Stock Plan or any other equity plan or arrangement for the Corporation's employees, directors and/or consultants approved by the Corporation's Board of Directors; (iii) in connection with the conversion, exercise or exchange of any Rights or Convertible Securities; (iv) in connection with joint ventures, strategic alliances, partnerships, leasing or financing arrangements primarily for non-equity financing purposes approved by the Board of Directors; (v) in connection with acquisitions of or by the Corporation whether by merger, consolidation, sale of assets, sale or exchange of stock or otherwise; or (vi) in a Qualified IPO. The rights to receive notice of and to purchase shares of Common Stock, Rights or Convertible Securities referred to in Section 8(a) and Section 8(b) may be waived upon written notice received by the Corporation, whether prior to or subsequent to a New Issuance, from the holders of at least a majority of the then outstanding shares of Series A and A-1 Preferred, voting together as a single class on an as-converted basis.

C. Undesignated Preferred.

1. Authority To Issue. Subject to any limitations prescribed by law, the Board of Directors or any authorized committee thereof is expressly authorized to provide for the issuance of the shares of Undesignated Preferred in one or more series of such stock, and by filing a certificate pursuant to applicable law of the State of Delaware, to establish or change from time to time the number of shares to be included in each such series, and to fix the designations, powers, preferences and the relative, participating, optional or other special rights of the shares of each series and any qualifications, limitations and restrictions thereof.

2. Powers, Preferences, Rights, Qualifications, Limitations and Restriction of Each Series of Undesignated Preferred. The Board of Directors or any authorized committee thereof shall have the right to determine or fix one or more of the following with respect to each series of Undesignated Preferred to the fullest extent permitted by law:

- (a) The distinctive serial designation and the number of shares constituting such series;
- (b) The dividend rates or the amount of dividends to be paid on the shares of such series, whether dividends shall be cumulative and, if so, from which date or dates, the payment date or dates for dividends, and the participating and other rights, if any, with respect to dividends;

- (c) The voting rights and powers, full or limited, if any, of the shares of such series;
- (d) Whether the shares of such series shall be redeemable and, if so, the price or prices at which, and the terms and conditions on which, such shares may be redeemed;
- (e) The amount or amounts payable upon the shares of such series and any preferences applicable thereto in the event of voluntary or involuntary liquidation, dissolution or winding up of the Corporation;
- (f) Whether the shares of such series shall be entitled to the benefit of a sinking or retirement fund to be applied to the purchase or redemption of such shares, and if so entitled, the amount of such fund and the manner of its application, including the price or prices at which such shares may be redeemed or purchased through the application of such fund;
- (g) Whether the shares of such series shall be convertible into, or exchangeable for, shares of any other class or classes or of any other series of the same or any other class or classes of stock of the Corporation and, if so convertible or exchangeable, the conversion price or prices, or the rate or rates of exchange, and the adjustments thereof, if any, at which such conversion or exchange may be made, and any other terms and conditions of such conversion or exchange;
- (h) The consideration for which the shares of such series shall be issued;
- (i) Whether the shares of such series which are redeemed or converted shall have the status of authorized but unissued shares of Undesignated Preferred (or a series thereof) and whether such shares may be reissued as shares of the same or any other class or series of stock;
- (j) Whether, and the extent to which, any of the rights, powers, preferences and terms of any such class or series may be made dependent upon facts ascertainable outside of the Certificate of Incorporation or outside the resolution or resolutions providing for the issuance of such class or series by the Board of Directors, provided that the manner in which such facts shall operate is clearly set forth in the resolution or resolutions providing for the issuance of such class or series adopted by the Board of Directors; and
- (k) Such other powers, preferences, rights, qualifications, limitations and restrictions thereof as the Board of Directors or any authorized committee thereof may deem advisable.

FIFTH: The Corporation is to have perpetual existence.

SIXTH: For the management of the business and for the conduct of the affairs of the Corporation, and in further definition and not in limitation of the powers of the Corporation

and of its directors and of its stockholders or any class thereof, as the case may be, conferred by the State of Delaware, it is further provided that:

(a) The management of the business and the conduct of the affairs of the Corporation shall be vested in its Board of Directors. Subject to the provisions of this Restated Certificate of Incorporation, as amended from time to time, the number of directors which shall constitute the whole Board of Directors shall be fixed by, or in the manner provided in, the By-Laws. The phrase "whole Board" and the phrase "total number of directors" shall be deemed to have the same meaning, to wit, the total number of directors which the Corporation would have if there were no vacancies. No election of directors need be by written ballot.

(b) After the original or other By-Laws of the Corporation have been adopted, amended or repealed, as the case may be, in accordance with the provisions of Section 109 of the General Corporation Law of the State of Delaware, and, after the Corporation has received any payment for any of its stock, the power to adopt, amend or repeal the By-Laws of the Corporation may be exercised by the Board of Directors of the Corporation.

(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: 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 said section as amended or supplemented (or any successor), provided, however, that except with respect to proceedings to enforce rights to indemnification, the By-Laws of the Corporation may provide that the Corporation shall 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.

EIGHTH: 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 of 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.

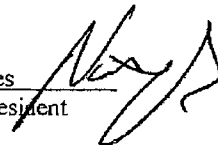
NINTH: Whenever a compromise or arrangement is proposed between this Corporation and its creditors or any class of them and/or between this Corporation and its stockholders or any class of them, any court of equitable jurisdiction within the State of Delaware may, on the application in a summary way 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 Title 8 of the Delaware Code 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 Title 8 of the Delaware Code, 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 matter as the said court directs. If a majority in number representing three-fourths (3/4) in value of the creditors or class of creditors, any/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, the said compromise or arrangement and the said reorganization shall, if sanctioned by the court to which the said 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: Subject to the provisions of this Restated Certificate of Incorporation, from time to time any of the provisions of this Restated Certificate may be amended, altered 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 are granted subject to the provisions of this Article.

IN WITNESS WHEREOF, the Corporation has caused this Amended and Restated Certificate of Incorporation to be signed by its duly authorized officer this 17th day of September, 2009.

TWISTDX, INC.

By: /s/ Niall A. Armes
Niall A. Armes, President



CERTIFICATE OF MERGER

OF

TWDX MERGER SUB, INC.,

WITH AND INTO

TWISTDX, INC.

Pursuant to Title 8, Section 251 of the Delaware General Corporation Law ("**DGCL**"):

FIRST, the name and state of incorporation of each of the constituent corporations are as follows: TWDX MERGER SUB, INC. (the "**Merging Corporation**"), a Delaware corporation, and TWISTDX, INC., (the "**Corporation**") a Delaware corporation.

SECOND, an Agreement and Plan of Merger, dated December 2, 2009, as amended (the "**Agreement**") has been approved, adopted, executed and acknowledged by the constituent corporations to the merger in accordance with DGCL Section 251.

THIRD, the surviving corporation of the Merger (the "**Surviving Corporation**") shall be the Corporation and the name of the Surviving Corporation shall be TwistDx, Inc.

FOURTH, the certificate of incorporation of the Surviving Corporation shall be superseded and replaced in its entirety with the Certificate of Incorporation attached hereto as Exhibit A.

FIFTH, the merger shall be effective upon the filing of this Certificate of Merger with the Delaware Secretary of State.

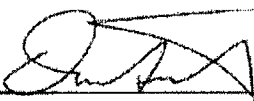
SIXTH, the executed Agreement is on file at the principal place of business of the Surviving Corporation, located at 51 Sawyer Road, Suite 200, Waltham, Massachusetts 02453.

SEVENTH, a copy of the Agreement will be furnished by the Surviving Corporation on request, without cost, to any stockholder of any constituent corporation.

[Signature on following page.]

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Merger to be executed by an authorized officer, effective as of March 11, 2010.

TWISTDX, INC.

By: 

Name: David A. Teitel

Title: President

Signature Page to Certificate of Merger

PATENT
REEL: 037971 FRAME: 0871

Exhibit A

**CERTIFICATE OF INCORPORATION
OF
TWISTDX, INC.**

First The name of the corporation (the "Corporation") is TwistDx, Inc.

Second The address of the registered office of the Corporation in the State of Delaware is c/o The Corporation Trust Company, 1209 Orange Street, Wilmington, County of New Castle, Delaware 19801. The name of its registered agent at such address is The Corporation Trust Company.

Third The nature of the business or purposes to be conducted or promoted by 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.

Fourth The total number of shares of capital stock that the Corporation has the authority to issue shall be 1,000 shares of common stock ("Common Stock"), each of which shall have a par value of \$0.001, amounting to an aggregate par value of \$1.00.

Fifth In furtherance of and not in limitation of powers conferred by statute, it is further provided that:

(a) subject to the limitations and exceptions, if any, contained in the by-laws of the Corporation, such by-laws may be adopted, amended or repealed by the board of directors of the Corporation; and

(b) elections of directors need not be by written ballot unless, and only to the extent, otherwise provided in the by-laws of the Corporation; and

(c) subject to any applicable requirements of law, the books of the Corporation may be kept outside the State of Delaware at such location or locations as may be designated by the board of directors of the Corporation or in the by-laws of the Corporation; and

(d) except as provided to the contrary in the provisions establishing a class of stock, the number of authorized shares of such class may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the stock of the Corporation entitled to vote, voting as a single class.

Sixth The Corporation shall indemnify and hold harmless, to the fullest extent permitted by the General Corporation Law of the State of Delaware as it presently exists or may hereafter be amended, any director or officer of the Corporation who was or is made or is threatened to be made a party or is otherwise involved in any action, suit or proceeding, whether civil, criminal, administrative or investigative (a "Proceeding") by reason of the fact that he or she, or a person for whom he or she is the legal representative, is or was a director, officer, employee or agent of the Corporation or is or was serving at the request of the Corporation as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust, enterprise or non-profit entity, including service with respect to employee benefit plans, against all liability and loss suffered and expenses reasonably incurred by such person in connection with any such Proceeding. The Corporation shall be required to indemnify a person in connection with a Proceeding initiated by such person only if the Proceeding was authorized by the board of directors.

The Corporation shall have the power to indemnify and hold harmless, to the extent permitted by applicable law as it presently exists or may hereafter be amended, any employee or agent of the Corporation who was or is made or is threatened to be made a party or is otherwise involved in any Proceeding by reason of the fact that he or she, or a person for whom he or she is the legal representative, is or was an employee or agent of the Corporation or is or was serving at the request of the Corporation as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust, enterprise or non-profit entity, including service with respect to employee benefit plans, against all liability and loss suffered and expenses reasonably incurred by such person in connection with any such Proceeding.

Neither any amendment nor repeal of this Article SIXTH, nor the adoption of any provision of this Corporation's Certificate of Incorporation inconsistent with this Article SIXTH, shall eliminate or reduce the effect of this Article SIXTH in respect of any matter occurring, or any cause of action, suit or claim accruing or arising or that, but for this Article SIXTH, would accrue or arise, prior to such amendment, repeal or adoption of an inconsistent provision.

Seventh Whenever a compromise or arrangement is proposed between this Corporation and its creditors or any class of them 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 Section 291 of Title 8 of the Delaware Code or on the application of trustees in dissolution or of any receiver or receivers appointed for this Corporation under Section 279 of Title 8 of the Delaware Code 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 said court directs. If a majority in number representing three-fourths 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 a consequence of such compromise or arrangement, the said compromise or arrangement and the said reorganization shall, if sanctioned by the court to which the said 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.

Eighth No director of the Corporation shall be personally liable to the Corporation or to any of its stockholders for monetary damages arising out of such director's breach of fiduciary duty as a director of the Corporation, except to the extent that the elimination or limitation of such liability is not permitted by the General Corporation Law of the State of Delaware, as the same exists or may hereafter be amended. No amendment to or repeal of the provisions of this Article EIGHTH shall deprive any director of the Corporation of the benefit hereof with respect to any act or failure to act of such director occurring prior to such amendment or repeal.

Ninth The Corporation reserves the right to amend, alter, change or repeal any provision contained in this Certificate of Incorporation in the manner now or hereafter prescribed by the General Corporation Law of the State of Delaware and this Certificate of Incorporation, and all rights conferred upon stockholders herein are granted subject to this reservation.

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