

Amended and Restated effective May 24, 2007

BY-LAWS

of

GENZYME CORPORATION

ARTICLE I

Meetings of Shareholders

Section 1. Place. Meetings of the shareholders shall be held at the principal office of the corporation in Massachusetts or at such other place as may be determined by the board of directors or an officer designated by the board of directors and identified in the notice to shareholders of such meeting.

Section 2. Annual Meetings. The annual meeting of the shareholders shall be held on the fourth Thursday of May or on such other date determined by the board of directors and shall be at such time and place as the board of directors or an officer designated by the board of directors shall determine.

Section 3. Special Meetings. Special meetings of the shareholders may be called only by the president *or* by the board of directors, and shall be called by the secretary or, in case of the death, absence, incapacity or refusal of the secretary, by any other officer, if the secretary receives written demands for a meeting describing the purposes for which such meeting is to be held signed and dated by holders of at least 90% (or such lesser percentage as may be required by law) of all the votes entitled to be cast on any issue to be considered at the proposed special meeting.

Section 4. Notice. A written notice of the date, place and time of each meeting of shareholders describing the purposes of the meeting shall be given by the secretary or an assistant secretary (or by any other officer who is authorized to provide notice of such meeting) no fewer than 7 nor more than 60 days before the meeting date to each shareholder entitled to vote thereat and to each other shareholder to whom the corporation is required to provide such notice by deposit in the United States mail, postage prepaid, and addressed to such shareholder at the shareholder's address as it appears in the records of the corporation, or by electronic transmission directed to such shareholder in such manner as the shareholder shall have specified to the corporation, including by facsimile transmission, electronic mail or posting on an electronic network. Notwithstanding the foregoing, in the case of any special meeting called upon the written demands of shareholders, such meeting shall be scheduled not less than 60 days nor more than 90 days after the date on which the secretary has received sufficient demands to require that such meeting be called and written notice thereof shall be given in accordance with the preceding sentence within 30 days after receipt of such demands. Whenever notice of a meeting is required to be given to a shareholder under applicable law, the articles of organization or these by-laws, a written waiver thereof, executed before or after the meeting by such

shareholder and filed with the records of the meeting, shall be deemed equivalent to such notice. In addition, any shareholder who attends the meeting (a) without objecting to holding the meeting or transacting business at the meeting at the beginning of the meeting or promptly upon the shareholder's arrival or who thereafter votes for or assents to action taken at the meeting waives objection to lack of notice or defective notice of the meeting or (b) without objecting to the consideration of a particular matter when it is presented waives objection that the matter is not within the purposes described in the notice for such meeting.

Section 5. Shareholder Nominations of Directors. Only persons who are nominated in accordance with the following procedures shall be eligible for election as directors at any annual or special meeting. Nominations of persons for election as directors may be made by or at the direction of the board of directors (including through a committee delegated such function), or by any shareholder entitled to vote for the election of directors at the meeting who complies with the notice procedures set forth in this section. Such nominations, other than those made by or at the direction of the board of directors, shall be made pursuant to timely notice in writing to the chairman of the board, if any, the president or the secretary. To be timely, a shareholder's notice must be delivered to or mailed and received at the principal executive offices of the corporation the earlier of: (a) not less than 90 days nor more than 120 days prior to the anniversary date of the prior year's annual meeting; provided, however, that this subsection (a) shall not apply if (i) there was no annual meeting in the prior year or (ii) the date of the current year's annual meeting is more than 30 days from the anniversary date of the prior year's annual meeting; or (b) 60 days prior to the annual meeting; provided, however, that (except as to an annual meeting held on the date specified in these by-laws, such date not having been changed since the last annual meeting), if less than 65 days' notice or prior public disclosure of the date of the meeting is given or made to shareholders, notice by the shareholder to be timely must be so received not later than the close of business on the 15th day following the day on which such notice of the date of the meeting was deposited in the United States mail or sent by electronic transmission or such public disclosure was made. Such shareholder's notice shall set forth (a) as to each person whom the shareholder proposes to nominate for election or re-election as a director: (i) the name, age, business address and residence address of the person, (ii) the principal occupation or employment of the person, (iii) the class and number of shares of capital stock of the corporation which are beneficially owned by the person and (iv) any other information relating to the person that is required to be disclosed in solicitations for proxies for election of directors pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended, or any successor regulation thereto; and (b) as to the shareholder giving the notice: (i) the name and record address of such shareholder and (ii) the class and number of shares of capital stock of the corporation which are beneficially owned by such shareholder. No person shall be eligible for election as a director at any annual or special meeting of shareholders unless nominated in accordance with the procedures set forth herein.

The chairman of the meeting shall, if the facts warrant, determine that a nomination was not made in accordance with the foregoing procedures, and, if the chairman should so determine, the chairman shall so declare to the meeting and the defective nomination shall be disregarded.

Section 6. Advance Notice of Shareholder-Proposed Business at Annual Meetings. At an annual meeting of the shareholders, only such business shall be conducted as shall have been properly brought before the meeting. To be brought properly before an annual meeting, business must be specified in the notice with respect to such meeting contemplated by Section 4 of this Article I (or any supplement thereto) or otherwise properly brought before the meeting by or at the direction of the board of directors. In addition to any other applicable requirements, for business to be brought properly before an annual meeting by a shareholder, the shareholder must comply with the requirements of Rule 14a-8 under the Securities Exchange Act of 1934, as amended, or any successor rule thereto, and, pursuant to such rule, have had such business included in the notice with respect to such meeting.

Notwithstanding anything in these by-laws to the contrary, no business shall be conducted at the annual meeting except in accordance with the procedures set forth in this section, provided, however, that nothing in this section shall be deemed to preclude discussion by any shareholder of any business properly brought before the annual meeting in accordance with said procedure.

The chairman of an annual meeting shall, if the facts warrant, determine that business was not properly brought before the meeting in accordance with the provisions of this section, and if the chairman should so determine, the chairman shall so declare to the meeting and any such business not properly brought before the meeting shall not be transacted.

Section 7. Quorum. Except as otherwise provided by law or by the articles of organization or by these by-laws, at any meeting of shareholders, a majority of the votes entitled to be cast on a matter by a voting group shall constitute a quorum with respect to that voting group for action on that matter. Though less than a quorum is present, any meeting may be adjourned from time to time without further notice until a quorum is secured.

Section 8. Action by Vote. With respect to each voting group, when a quorum is present at any meeting with respect to a matter, (a) upon any matter other than an election of a director, votes properly cast in the voting group favoring the matter exceeding the votes properly cast in the voting group opposing the matter shall constitute favorable action on the matter, except when a larger number of affirmative votes is required by law, the articles of organization or these bylaws or when the board of directors requires a larger aggregate number of affirmative votes upon such matter (to the extent permitted by law), (b) in an uncontested election, votes properly cast in favor of election of a director exceeding the votes properly cast against such election shall effect the election of a director, and (c) in a contested election, the vote required to effect the election of a director shall be a plurality of the votes cast in such election. An election of directors shall be considered contested if, as of the record date for the applicable meeting, there are more nominees for election than positions on the board of directors to be filled by election at the meeting. All other elections of directors shall be considered uncontested.

Section 9. Voting. Shareholders entitled to vote shall have one vote for each share of stock entitled to vote held by them of record according to the records of the corporation, unless otherwise provided by the articles of organization. Absent special circumstances, the corporation, except in a fiduciary capacity, shall not, directly or indirectly, vote any shares of its own stock. Shareholders may vote in person or by proxy.

Section 10. Action by Consent. Except as otherwise required by law, any action required or permitted to be taken by the shareholders may be taken without a meeting if evidenced by consents signed by all shareholders entitled to vote on the matter.

ARTICLE II

Officers and Directors

Section 1. Enumeration. The corporation shall have a board of directors consisting of not less than three directors, except that whenever there shall be fewer than three shareholders, the number of directors may be less than three but in no event less than the number of shareholders. The number of directors shall be fixed by the board of directors and may be enlarged at any time by vote of a majority of the directors then in office. The officers of the corporation shall be a president, a treasurer, a secretary and such other officers as the board of directors may from time to time appoint.

Section 2. Qualifications. Directors and officers need not be shareholders. No officer need be a director. Two or more offices may be held by the same person.

Section 3. Election. The directors shall be elected in the manner provided in the articles of organization, by such shareholders as have the right to vote thereon. The board of directors at their annual meeting shall appoint a president, a treasurer and a secretary, and may at any time appoint such other officers as the board shall determine.

Section 4. Removal. Directors may be removed from office only as provided in the articles of organization. Officers may be removed from their respective offices with or without cause by the board of directors.

Section 5. Resignation. Resignations by directors shall be given in writing to the board of directors, the chairman of the board or the corporation. Resignations by officers shall be given in writing to the corporation. Each such resignation shall be effective upon receipt unless specified to be effective at some other time acceptable to the board of directors.

Section 6. Vacancies. Continuing directors may act despite a vacancy or vacancies in the board of directors and shall for this purpose be deemed to constitute the full board of directors. Any vacancy in the board of directors, however occurring, including a vacancy resulting from the enlargement of the board of directors, shall be filled by the directors then in office, though less than a quorum.

ARTICLE III

Meeting of the Directors

Section 1. Regular Meetings. Regular meetings of the board of directors may be held without notice at such times and places as the board of directors may fix. An annual meeting of the board of directors *may* be held in each year immediately after and at the place of the meeting at which directors are elected by shareholders.

Section 2. Special Meetings. Special meetings of the board of directors may be held at any time and at any place designated in the notice of the meeting, when called by the chairman of the board, if any, the president, the secretary or by two or more directors.

Section 3. Notice. No notice need be given for a regular or annual meeting of the board of directors. Two days' notice shall be given for a special meeting unless waived. A notice or waiver of notice need not specify the purpose of the meeting. Notice of a meeting need not be given to any director if a waiver of notice, signed by the director before or after the meeting, or delivered by means of electronic transmission, is filed with the minutes, or to any director who attends the meeting without objecting to holding the meeting or transacting business at the meeting at the beginning of the meeting or promptly upon the director's arrival or who thereafter votes for or assents to action taken at the meeting.

Section 4. Quorum. A majority of the directors then in office shall constitute a quorum, but a smaller number may make a determination pursuant to Section 8.55 or Section 8.56 of chapter 156D of the Massachusetts General Corporation Act that indemnification is permissible in a specific proceeding. In addition, though less than a quorum is present, the chairman of the board, if any, or a majority of the votes cast on the question may adjourn a meeting finally or from time to time without further notice until a quorum is secured. If a quorum is present, a majority of the directors present may take any action on behalf of the board of directors unless a different number is required by law, the articles of organization or these by-laws.

Section 5. Action by Consent. Any action required or permitted to be taken at any meeting of the board of directors may be taken without a meeting if all the directors consent to the action in writing or by means of electronic transmission and the consents are filed with the records of the meetings of board of directors. Such consents shall be treated for all purposes as votes at a meeting.

Section 6. Committees. The board of directors may create committees of the board of directors and may delegate to such committees some or all of the powers of the board of directors to the extent permitted by law. Except as the board of directors may otherwise determine, any such committee may make rules for the conduct of its business, but unless otherwise provided by the board of directors or in such rules, its business shall be conducted as nearly as practical in the same manner as is provided by these by-laws for the board of directors. The board of directors shall have the power at any time to fill vacancies in any such committee, to change its membership or to discharge the committee.

ARTICLE IV

Powers and Duties of Directors and Officers

Section 1. Directors. The business and affairs of the corporation shall be managed under the direction of the board of directors, which may exercise all powers of the corporation as are not by law, by the articles of organization or by these by-laws required to be otherwise exercised. The board of directors may from time to time, to the extent permitted by law, delegate

any of its powers to committees, officers, attorneys or agents of the corporation, subject to such limitations as the board of directors may impose.

Section 2. Chairman and President. The board of directors may appoint a chairman of the board who, unless otherwise determined by the board of directors, shall, when present, preside at meetings of the board of directors and shall have such other powers and duties as customarily belong to the office of chairman of the board or as may be designated from time to time by the board of directors. The president shall be the chief executive officer of the corporation, unless the board of directors designates another officer, in which event the president shall, unless the board of directors otherwise determines, be the chief operating officer. The chief executive officer shall, subject to the direction of the board of directors, have general supervision and control of the business of the corporation. Except as provided above regarding the chairman of the board and unless the board of directors specifies otherwise, the chief executive officer shall preside at all meetings of shareholders and of the board of directors at which the chief executive officer is present. The president and the chief executive officer shall perform such other duties and shall have such other powers as the board of directors may designate from time to time.

Section 3. Treasurer. Except as the board of directors shall otherwise determine, the treasurer shall be the chief financial and accounting officer of the corporation and shall have such other powers and duties as customarily belong to the office of treasurer or as may be designated from time to time by the board of directors or by the president.

Section 4. Secretary. The secretary and any assistant secretaries shall have responsibility for preparing, or overseeing the preparation of, minutes of shareholders' and board of directors' meetings and for authenticating, or overseeing the authentication of, records of the corporation.

Section 5. Other Officers. Other officers of the corporation, if any, shall have such powers, duties and titles as may be designated from time to time by the board of directors or by the president.

ARTICLE V

Employment Contracts

The corporation may enter into employment contracts authorized by the board of directors extending beyond the terms of the directors. An employment contract shall be valid despite any inconsistent provision of these by-laws relating to terms of officers and removal of officers with or without cause but shall not affect the authority of the board of directors to remove officers. Any removal or failure to reappoint an officer shall be without prejudice to the officer's contract rights, if any.

ARTICLE VI

Indemnification of Directors and Officers

The corporation shall indemnify its directors and the officers that have been appointed by the board of directors to the fullest extent permitted by law, and may indemnify such other employees as are identified by the board of directors.

ARTICLE VII

Stock and Transfer Books

The corporation or its agent shall maintain a record of its shareholders, in a form that permits preparation of a list of names and addresses of all shareholders, in alphabetical order by class of shares showing the number and class of shares held by each. The corporation for all purposes may conclusively presume that the registered holder of a stock certificate is the absolute owner of the shares represented thereby and that the stockholder's record address is the stockholder's correct address.

ARTICLE VIII

Share Certificates

The board of directors may authorize the issue without certificates of some or all of the shares of any or all of the corporation's classes or series of stock. Except to the extent the board of directors has determined to issue shares without certificates, a shareholder shall be entitled to a certificate stating the number, the class and the designation of the series, if any, of the shares the certificate represents, in such form as shall, in conformity with law, be prescribed from time to time by the board of directors. Such certificate shall be signed (a) by the chairman of the board, the president or a vice president and (b) by the treasurer or an assistant treasurer or the secretary or an assistant secretary. Such signatures may be facsimiles. If the person who signed, either manually or in facsimile, a share certificate no longer holds office when the certificate is issued, the certificate shall be nevertheless valid.

ARTICLE IX

Seal and Fiscal Year

The seal shall be circular in form with the name of the corporation around the periphery and words and figures "Incorporated 1991 Massachusetts" within. The fiscal year shall be fixed from time to time by the board of directors.

ARTICLE X

Massachusetts Control Share Acquisition Act

The provisions of Chapter 110D of the Massachusetts General Laws shall not apply to the corporation.

ARTICLE XI

Execution of Documents

Except as the board of directors may generally or in particular cases authorize the execution thereof in some manner, all deeds, leases, transfers, contracts, bonds, notes, checks, drafts and other obligations made, accepted or endorsed by the corporation shall be signed by the chairman of the board, if any, the president, a vice president or the treasurer.

ARTICLE XII

Amendment of By-Laws

These by-laws may be amended, altered or repealed in whole or in part, and new by-laws may be adopted, by the shareholders, in each case, by votes cast in favor of such action representing a majority of the votes entitled to be cast on the matter. The board of directors may also make, amend or repeal these by-laws in whole or in part, except with respect to any provision that by law, the articles of organization or these by-laws requires action by the shareholders. Not later than the time of giving notice of the meeting of shareholders next following the making, amending or repealing by the board of directors of any by-law, notice thereof stating the substance of the action taken by the board of directors shall be given to all shareholders entitled to vote on amending the by-laws.

Adopted by the board of directors February 26, 2004

Approved by the shareholders May 27, 2004

Amended by the directors July 1, 2004

Amended by the shareholders May 24, 2007