



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

January 14, 2014

Via Email

Douglas M. Fambrough, III, Ph.D.
Chief Executive Officer
Dicerna Pharmaceuticals, Inc.
480 Arsenal Street
Building 1, Suite 120
Watertown, Massachusetts 02472

**Re: Dicerna Pharmaceuticals, Inc.
Registration Statement on Form S-1
Filed December 31, 2013
File No. 333-193150**

Dear Dr. Fambrough:

We have reviewed your registration statement and response letter filed December 31, 2013 and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

Statistical Data and Market Information, page 41

1. We note your response to our prior comment 11 and reissue the comment in part. We continue to believe your statement that you have not independently verified the accuracy or completeness of the data reflects as an inappropriate disclaimer of the information in the registration statement. Please remove this statement from your registration statement.

Use of Proceeds, page 42

2. We note your response to comment 12 and reissue the comment in part. Item 504 of Regulation S-K requires disclosure of the approximate amount intended to be used for each specific purposes identified in the prospectus. We understand that the development of product candidates is subject to uncertainty, but that does not relieve you of your obligation to provide investors with your best estimate, based on reasonable assumptions,

of the manner in which you will allocate investors' funds. Please revise your use of proceeds discussion, accordingly.

Management's Discussion and Analysis Critical Accounting Policies and Significant Judgments and Estimates Stock-based compensation and common stock valuation Stock Option Grants, page 57

3. You granted 1.4 million options on September 24, 2013 in which you determined that the fair value of the common stock was \$2.01 per share. Please address the following:
 - Disclose the factors contributing to the difference between the fair value of \$3.42 on August 31, 2013 as disclosed on page 62 and \$2.01 on September 24, 2013 as disclosed on pages 57 and F-21.
 - You state on page F-21 that on September 24, 2013, the Board of Directors approved the repricing of all of the then outstanding 24,811 stock options, to a new per-share exercise price of \$3.42, which represented the current per-share fair market value. This disclosure appears to contradict the disclosure of the fair value being \$2.01 per share on September 24, 2013 as disclosed on pages 57 and F-21.
 - Tell us why you believe the factors contributing to the decline in fair value from \$15 per share at December 31, 2012 to \$3.42 on August 31, 2013 explain the significant decline. Please substantiate each factor listed on page 62 attributing to this decline. For example, it is not clear why a delay in identifying product candidates would be a significant factor. In addition, it is unclear the basis for the assertion that the strength in private equity markets declined, particularly with respect to the biotech industry. Lastly, the preferred stock issuance at \$7 per share, which was convertible into one share of common stock appears to indicate a much higher fair value per common share. Please advise.
 - Disclose the intrinsic value of the vested and unvested options based on the estimated IPO price.
 - Tell us why use of the back-solve method is appropriate for valuing your common stock at August 31, 2013. In this regard, tell us what percentage of the preferred stock was considered issued at arms' length and why you believe the preferred stock was issued at arms' length.
 - Please note that we will defer a final evaluation of stock compensation and related costs until an estimated IPO price has been provided.
 - Confirm that no additional equity issuances such as options, warrants, preferred stock, common stock, etc. were made subsequent to the latest filing or provide additional disclosure in that regard.

Business, page 69

4. We note your response to our prior comment 14 and reissue this comment. Please expand your disclosure to indicate how other RNAi-inducing molecules are typically delivered and how the potency of other RNAi molecules is impacted by their number of conjugation points.

Strategic Partnerships and Collaborations

KHK research collaboration and license agreement, page 84

5. We note your response to our prior comment 16. Please expand your disclosure to provide the duration of the agreement if you do not exercise your option to co-promote an oncogene KRAS product in the U.S.
6. We note your response to our prior comment 16. The percentage royalty payment that KHK may be obligated to pay on net sales under your collaboration agreement represents a material term of the agreement that should be disclosed to investors in the registration statement. To the extent that you seek confidential treatment for specific individual royalty percentages, we would be willing to accept disclosure of an applicable range of royalties, provided such range is within ten percentage points of the royalty percentage (e.g., “single digits,” “between 10 and 20 percent”). Please revise your disclosure accordingly.

City of Hope License Agreement, page 85

7. We note your response to our prior comment 17. Milestone payments under license agreements typically represent material payment obligations. Nonetheless, we are typically willing to grant confidential treatment for individual milestone amounts provided that the value of the maximum aggregate potential milestone payments is disclosed to investors. Please revise your disclosure to disclose the value of the maximum aggregate potential milestone payments you may be required to make under the agreement. Please also disclose the duration of your obligation to make royalty payments to COH.

In-Licenses, page 87

8. We note your response to our prior comment 19 and reissue the comment in part. Please revise your disclosure to disclose the value of the maximum aggregate potential milestone payments you may be required to make under the agreement.
9. We note your response to our prior comment 20. Please disclose the specific amount of aggregate potential milestone payments Carnegie may be entitled to receive under your agreement.

Executive and Director Compensation, page 106

10. Please revise your executive and director compensation disclosure to reflect the compensation awarded to named executive officers and directors during the most recently completed fiscal year ended December 31, 2013. Please also note that your Summary Compensation Table should continue to include the compensation awarded to NEOs in

the fiscal year ended December 31, 2012. Please refer to Instruction 1 to Item 402(n) of Regulation S-K.

Principal Stockholders, page 119

11. We note your response to our prior comment 25. Please revise the footnote with respect to the shares held by Abingworth Bioventures V, LP to include the information provided in your response in relation to the three-member investment committee and the absence of any individual with sole control or voting power over the shares.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Act of 1933 and all applicable Securities Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

You may contact Keira Ino at (202) 551-3659 or Mary Mast at (202) 551-3613 if you have questions regarding comments on the financial statements and related matters. Please contact Matthew Jones at (202) 551-3786, Bryan Pitko at (202) 551-3203 or me at (202) 551-3715 with any other questions.

Douglas M. Fambrough, III, Ph.D.
Dicerna Pharmaceuticals, Inc.
January 14, 2014
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Sincerely,

/s/ Bryan J. Pitko for

Jeffrey P. Riedler
Assistant Director

cc: Sam Zucker, Esq.
O'Melveny & Myers LLP
2765 Sand Hill Road
Menlo Park, California 94025