



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

DIVISION OF
CORPORATION FINANCE

January 27, 2014

Via E-mail

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.
Amendment No. 2 to Registration Statement on Form S-1
Filed January 21, 2014
File No. 333-193150**

Dear Dr. Fambrough:

We have reviewed your registration statement 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.

Management's Discussion and Analysis of Financial Condition and Results of Operations
Stock Option Grants, page 56

1. Refer to your discussion provided on page 58. Clearly state your best estimate of the common stock fair values. In this regard, if you believe that \$7.42 was the best estimate of common stock fair value in December 2013, your statement on page 58 that there was no intrinsic value on the issuance date appears inaccurate.
2. Your revised discussion in response to the third bullet of comment 3 does not fully address our concerns. The delay in identifying product candidates appears to support the common stock fair value remaining the same, rather than decline. Please explain to us why you believe this fact contributes to the decline in your fair value. In addition, please cite the source for your assertion that the strength in private biotech equity market has

declined, since it is our understanding that the equity market has generally improved during this time.

3. Please revise your discussion provided in response to the fifth bullet of comment 3 to clearly state, if true, that the Series C preferred stock was sold to unrelated parties.

Strategic Partnerships and Collaborations

KHK research collaboration and license agreement, page 85

4. We note your response to prior comment 6. Please revise your disclosure to provide a more narrow range of royalties that KHK is obligated to pay under your collaboration and license agreement. In particular, please limit your royalty disclosure to a 10-percent range (e.g. “high single digits to teens” or “between 5 and 15 percent”).

Notes to the Financial Statements

Common Stock and Stock Option Plan, page F-21

5. Refer to your response to the first bullet of comment 3. Your disclosure states that the weighted-average grant date fair value of stock options granted during the nine months ended September 30, 2013 was \$2.01. Please tell us how the weighted average was derived. Based on the disclosure in the table on page 58 the only options granted were granted at a fair value of \$3.42. Please revise to disclose any additional grants or revise your disclosure to clarify.

Exhibits

6. We note that the agreements filed as Exhibit 10.18, 10.19, and 10.20 include reference to various attached schedules and exhibits. These schedules and exhibits appear to have been omitted from the agreements filed as exhibits. Please amend your registration statement to file each of these agreements in their entirety with all exhibits and schedules thereto.

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.

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