

INITIAL STATEMENT OF BENEFICIAL OWNERSHIP OF SECURITIES

| OMB APPROVAL | |
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Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934 or Section 30(h) of the Investment Company Act of 1940

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| 1. Name and Address of Reporting Person* <u>O'Neill Vincent</u> (Last) (First) (Middle) <u>C/O MIRNA THERAPEUTICS, INC.</u> <u>2150 WOODWARD ST., SUITE 100</u> (Street) <u>AUSTIN TX 78744</u> (City) (State) (Zip) | 2. Date of Event Requiring Statement (Month/Day/Year) <u>04/25/2016</u> | 3. Issuer Name and Ticker or Trading Symbol <u>Mirna Therapeutics, Inc. [MIRN]</u> | |
| | | 4. Relationship of Reporting Person(s) to Issuer (Check all applicable) Director _____ 10% Owner _____ <input checked="" type="checkbox"/> Officer (give title below) Other (specify below) <u>Chief Medical Officer</u> | 5. If Amendment, Date of Original Filed (Month/Day/Year) 6. Individual or Joint/Group Filing (Check Applicable Line) <input checked="" type="checkbox"/> Form filed by One Reporting Person <input type="checkbox"/> Form filed by More than One Reporting Person |

Table I - Non-Derivative Securities Beneficially Owned

| 1. Title of Security (Instr. 4) | 2. Amount of Securities Beneficially Owned (Instr. 4) | 3. Ownership Form: Direct (D) or Indirect (I) (Instr. 5) | 4. Nature of Indirect Beneficial Ownership (Instr. 5) |
|---------------------------------|---|--|---|
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Table II - Derivative Securities Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)

| 1. Title of Derivative Security (Instr. 4) | 2. Date Exercisable and Expiration Date (Month/Day/Year) | | 3. Title and Amount of Securities Underlying Derivative Security (Instr. 4) | | 4. Conversion or Exercise Price of Derivative Security | 5. Ownership Form: Direct (D) or Indirect (I) (Instr. 5) | 6. Nature of Indirect Beneficial Ownership (Instr. 5) |
|--|--|-----------------|---|----------------------------|--|--|---|
| | Date Exercisable | Expiration Date | Title | Amount or Number of Shares | | | |

Explanation of Responses:

No securities are beneficially owned.

/s/ Alan Fuhrman, Attorney-in-Fact for Vincent O'Neill 04/27/2016

** Signature of Reporting Person Date

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

* If the form is filed by more than one reporting person, see Instruction 5 (b)(v).

** Intentional misstatements or omissions of facts constitute Federal Criminal Violations See 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, see Instruction 6 for procedure.

Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB Number.

POWER OF ATTORNEY

Know all by these presents, that the undersigned hereby constitutes and appoints each of (i) the Chief Executive Officer of Mirna Therapeutics, Inc., a Delaware corporation (the "Company"), who is currently Paul Lammers, (ii) the Company's Chief Financial Officer, who is currently Alan Fuhrman and (iii) the Company's Vice President of Finance, who is currently Jon Irvin, and their respective successors, signing singly, the undersigned's true and lawful attorney-in-fact to:

- (1) execute for and on behalf of the undersigned, in the undersigned's capacity as a director of the Company, Forms 3, 4 and 5 (including amendments thereto) in accordance with Section 16(a) of the Securities Exchange Act of 1934 and the rules and regulations thereunder and a Form ID, Uniform Application for Access Codes to File on EDGAR;
- (2) do and perform any and all acts for and on behalf of the undersigned which may be necessary or desirable to complete and execute any such Forms 3, 4 or 5 or Form ID and timely file such forms (including amendments thereto) and application with the United States Securities and Exchange Commission and any stock exchange or similar authority; and
- (3) take any other action of any type whatsoever in connection with the foregoing which, in the opinion of such attorney-in-fact, may be of benefit to, in the best interest of, or legally required by, the undersigned, it being understood that the documents executed by such attorney-in-fact on behalf of the undersigned pursuant to this Power of Attorney shall be in such form and shall contain such terms and conditions as such attorney-in-fact may approve in such attorney-in-fact's discretion.

The undersigned hereby grants to each such attorney-in-fact full power and authority to do and perform any and every act and thing whatsoever requisite, necessary or proper to be done in the exercise of any of the rights and powers herein granted, as fully to all intents and purposes as the undersigned might or could do if personally present, with full power of substitution or revocation, hereby ratifying and confirming all that such attorney-in-fact, or such attorney-in-fact's substitute or substitutes, shall lawfully do or cause to be done by virtue of this power of attorney and the rights and powers herein granted. The undersigned acknowledges that the foregoing attorneys-in-fact, in serving in such capacity at the request of the undersigned, are not assuming, nor is the Company assuming, any of the undersigned's responsibilities to comply with Section 16 of the Securities Exchange Act of 1934.

The undersigned agrees that each such attorney-in-fact herein may rely entirely on information furnished orally or in writing by the undersigned to such attorney-in-fact. The undersigned also agrees to indemnify and hold harmless the Company and each such attorney-in-fact against any losses, claims, damages or liabilities (or actions in these respects) that arise out of or are based upon any untrue statements or omission of necessary facts in the information provided by the undersigned to such attorney-in fact for purposes of executing, acknowledging, delivering or filing Forms 3, 4 or 5 (including amendments thereto) or Form ID and agrees to reimburse the Company and such attorney-in-fact for any legal or other expenses reasonably incurred in connection with investigating or defending against any such loss, claim, damage, liability or action.

This Power of Attorney supersedes any power of attorney previously executed by the undersigned regarding the purposes outlined in the first paragraph hereof ("**Prior Powers of Attorney**"), and the authority of the attorneys-in-fact named in any Prior Powers of Attorney is hereby revoked.

This Power of Attorney shall remain in full force and effect until the undersigned is no longer required to file Forms 3, 4 or 5 with respect to the undersigned's holdings of and transactions in securities issued by the Company, unless earlier (a) revoked by the undersigned in a signed writing delivered to the foregoing attorneys-in-fact or (b) superseded by a new power of attorney regarding the purposes outlined in the first paragraph hereof dated as of a later date.

IN WITNESS WHEREOF, the undersigned has caused this Power of Attorney to be executed as of this 11th day of April, 2016.

/s/ Vincent O'Neill
Vincent O'Neill