

Mirna Therapeutics, Inc.
2150 Woodward Street, Suite 100
Austin, TX 78744

September 25, 2015

VIA EDGAR AND E-MAIL

United States Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549-6010

Attention: Jeffrey P. Riedler, Assistant Director
Tara Keating Brooks
Bryan Pitko
Sasha Parikh
Jim Rosenberg

Re: Mirna Therapeutics, Inc. Registration Statement on Form S-1 (Registration No. 333-206544)

Ladies and Gentlemen:

In accordance with Rule 461 of Regulation C of the General Rules and Regulations under the Securities Act of 1933, as amended, we hereby request acceleration of the effective date of the Registration Statement on Form S-1 (File No. 333-206544) (the "**Registration Statement**") of Mirna Therapeutics, Inc. (the "**Company**"). We respectfully request that the Registration Statement become effective as of 4:00 p.m., Washington, D.C. time, on September 29, 2015, or as soon as practicable thereafter. Once the Registration Statement has been declared effective, please orally confirm that event with our counsel, Latham & Watkins LLP, by calling Mark Roeder at (650) 463-3043.

The Company acknowledges the following:

- should the Securities and Exchange Commission (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.

Thank you for your assistance in this matter.

Very truly yours,

MIRNA THERAPEUTICS, INC.

By: /s/ Paul Lammers
Paul Lammers, M.D., M.Sc.
President and Chief Executive Officer

CC: Alan Fuhrman, Mirna Therapeutics, Inc.
Jon Irvin, Mirna Therapeutics, Inc.
Alan C. Mendelson, Esq., Latham & Watkins LLP
Mark V. Roeder, Esq., Latham & Watkins LLP
Thomas Holden, Esq., Ropes & Gray LLP

September 25, 2015

Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549

**Re: Mirna Therapeutics, Inc.
Registration Statement on Form S-1 (SEC File No. 333-206544) (the "Registration Statement")**

Ladies and Gentlemen:

In connection with the above-referenced Registration Statement, and pursuant to Rule 461 under the Securities Act of 1933, as amended (the "Act"), we hereby join in the request of Mirna Therapeutics, Inc. that the effective date of the Registration Statement be accelerated so that it will be declared effective at 4:00 p.m., Washington, D.C. time, on September 29, 2015 or as soon thereafter as practicable.

Pursuant to Rule 460 under the Act, we wish to advise you that we have distributed approximately 1,687 copies of the preliminary prospectus dated September 18, 2015 (the "Preliminary Prospectus") through the date hereof, to underwriters, dealers, institutions and others.

In connection with the Preliminary Prospectus distribution for the above-referenced issue, the prospective underwriters have confirmed that they are complying with the 48-hour requirement as promulgated by Rule 15c2-8 under the Securities Exchange Act of 1934, as amended.

Very truly yours,

Citigroup Global Markets Inc.
Leerink Partners LLC

For themselves and as representatives of the several underwriters

By: CITIGROUP GLOBAL MARKETS INC.

By: /s/ Jennifer Jarrett

Name: Jennifer Jarrett

Title: Managing Director

By: LEERINK PARTNERS LLC

By: /s/ John I. Fitzgerald, Esq.

Name: John I. Fitzgerald, Esq.

Title: Managing Director

[Signature Page to Mirna Therapeutics, Inc. S-1 Acceleration Request]
