

REVIEWER'S REPORT

Manuscript No.: IJAR-51862

Date: 27-05-2025

Title: siRNA: Its Translation from Research to Therapeutic Applications

Recommendation:

Accept as it is.....YES.....

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		√		
Techn. Quality		√		
Clarity		√		
Significance		√		

Reviewer's Name: Mr Mir Bilal

Reviewer's Decision about Paper: **Recommended for Publication.**

Comments (*Use additional pages, if required*)

Reviewer's Comment / Report

1. Introduction:

The introduction provides a clear and concise overview of siRNA, highlighting its fundamental role in RNA interference (RNAi) and gene silencing. The explanation of siRNA's structure, function, and mechanism—particularly its guiding role in the RNA-induced silencing complex (RISC) targeting messenger RNA—is well-articulated and scientifically accurate. The emphasis on siRNA's therapeutic potential, including its specificity, ability to target traditionally “undruggable” proteins, and advantages such as reduced toxicity and rapid development, effectively underscores its significance in both research and clinical contexts. The introduction sets a strong foundation for understanding why siRNA has attracted considerable interest in precision medicine.

2. Historical Context and Discovery:

The historical section traces the discovery of siRNA thoroughly, beginning with early observations of gene silencing in plants during the 1990s, termed “co-suppression,” and progressing to the pivotal 1998

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work by Fire and Mello. The recognition of RNA interference as a conserved biological mechanism across multiple species is well explained. Mentioning the Nobel Prize awarded in 2006 lends appropriate weight to the discovery's scientific impact. The narrative smoothly connects these early findings to the synthesis of siRNA by Tuschl et al. in 2001, marking a transition from basic science to therapeutic application. The inclusion of foundational studies in plants, fungi, and animals provides a comprehensive evolutionary perspective on RNAi.

3. Scientific Clarity and Accuracy:

The manuscript demonstrates strong scientific rigor. Concepts are clearly defined, and technical terms are appropriately used with accompanying explanations that are accessible to readers with a molecular biology background. The dual mention of the RISC complex's role in the introduction effectively emphasizes the mechanism of siRNA action without redundancy. The chronological flow of discoveries is logical and well supported by references to key studies.

4. Writing and Presentation:

The writing is clear, professional, and well-organized, maintaining a coherent flow from general introduction to detailed history. Technical details are presented with clarity and precision, striking a balance between depth and readability. The manuscript is free of grammatical errors and technical inaccuracies.

Overall Evaluation:

This manuscript offers a well-structured and informative overview of siRNA, bridging its molecular basis with its translational potential in therapeutics. The historical recounting enriches the reader's understanding of siRNA's emergence and impact on gene regulation research. The clear articulation of siRNA's advantages in therapy underscores its relevance in modern medicine. The report is thorough, scientifically accurate, and presented in a manner suitable for academic or clinical audiences interested in molecular genetics and therapeutic innovation.