RNAa papers


Up-to-date Context (2009)
Welcome to the Li Lab!

Our lab studies the small RNA mediated gene activation (RNAa) mechanism and tries to understand whether RNAa is a naturally occurring phenomenon, if yes, whether it is involved in diseases especially cancer. We are also testing RNAa as cancer therapeutics and as a tool for stem cell reprogramming.

**TWO WAYS TO TURN ON A GENE**

Genes can be activated by targeting the promoter regions in front of them that control their activity. There are two ways it might work:

- Short double-stranded RNAs that match promoter of gene added to cell
- RNAs are assembled into protein complex

**SILENT**

Chemical tags on the histone proteins block gene expression

**OFF**

HISTONE PROTEIN

**OFF**

PROMOTER

**OFF**

PROTEIN-CODING REGION

**ACTIVE**

The complex binds to promoter and removes the “off” tags

**OFF**

**ACTIVE**

The complex binds to and destroys the RNA copies, allowing production of the protein

**OR**

The cell produces RNA copies of the promoter region that somehow block production of the protein, meaning the gene is silent
To date, ~60 citations

1. **Title**: Repressing the repressor A new mode of MYC action in lymphomagenesis  
   **Author(s)**: Sander S, Bullinger L, Wirth T  
   **Source**: CELL CYCLE  Volume: 8  Issue: 4  Pages: 556-559  Published: FEB 15 2009  
   **Times Cited**: 0

2. **Title**: RNA-directed DNA methylation induces transcriptional activation in plants  
   **Author(s)**: Shibuya K, Fukushima S, Takasuji H  
   **Source**: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA  Volume: 106  Issue: 5  Pages: 1660-1665  Published: FEB 3 2009  
   **Times Cited**: 0

3. **Title**: Up-regulation of E-cadherin by small activating RNA inhibits cell invasion and migration in 5637 human bladder cancer cells  
   **Author(s)**: Mao QQ, Li YB, Zheng XY, et al.  
   **Source**: BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS  Volume: 375  Issue: 4  Pages: 566-570  Published: OCT 31 2008  
   **Times Cited**: 0

4. **Title**: Regulating the regulators  
   **Author(s)**: Viegas SC, Arauano CM  
   **Source**: RNA BIOLOGY  Volume: 5  Issue: 4  Pages: 230-243  Published: OCT-DEC 2008  
   **Times Cited**: 0

5. **Title**: Bidirectional Transcription Directs Both Transcriptional Gene Activation and Suppression in Human Cells  
   **Author(s)**: Morris KV, Santoso S, Turner AM, et al.  
   **Source**: PLOS GENETICS  Volume: 4  Issue: 11 Article Number: e1000258  Published: NOV 2008  
   **Times Cited**: 1
Considering the news article

• “A three-year saga of frustration and exhilaration”
• Terminology + concepts:
  – miRNAs vs. siRNAs
  – Tumor suppressors
  – Phenomenon vs. mechanism
  – Natural phenomenon vs. lab artifact
  – Direct vs. indirect effect “inhibition in disguise”
  – mRNA vs. promoter regulation
Research article: the writing

• Condensed introduction
  – How is structure + content effective?
  – You will write one for your Module 2 report.
• How does abstract differ from introduction?
• Results vs. Discussion
  – Results: numbers, e.g., fold-change in transcript or protein (*some* basic conclusions drawn)
  – Discussion: summary, context, and implications, e.g., compare + contrast RNAi and RNAa, speculate about RNAa mechanism, generality
Figure-by-figure presentations