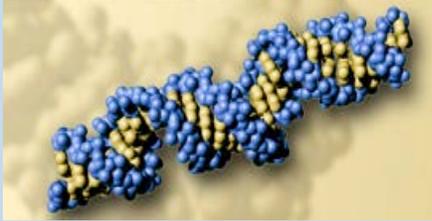


RNA Interference—Student Worksheet



About This Worksheet

This worksheet complements the Click and Learn “RNA Interference” developed in conjunction with the 1995 Holiday Lectures on Science, “The Double Life of RNA.”

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Answer the following questions as you proceed through the activity slides.

1. Study slide 2. What would you predict? Why?

2. Are you surprised by the information on slide 3? From your knowledge of gene expression, explain why you might have expected that adding more copies of a pigment gene to flowers would result in more pigment.

3. According to slide 4, researchers measured mRNA levels. Why do you think mRNA is an appropriate molecule to measure when studying gene expression?

There is an interesting question at the end of this slide. How would more copies of the gene reduce the amount of mRNA? Click and find out...

4. According to slide 5, what did researchers discover after they injected double-stranded RNA into *C. elegans*?

Is double-stranded RNA required for turning down gene expression?

5. According to slide 6, what is RDRP? Explain in your own words how it works and its connection to the flower pigment.

The control of gene expression by RNA has been named “RNA interference” (RNAi).
Click to learn more!

6. According to slide 7, has RNAi been observed in human cells?

7. Why is RNAi important during embryonic development?

8. According to slide 8, what are two ways in which RNAi interferes with mRNA?

9. According to slide 9, what are three sources of double stranded RNA?

10. According to slide 10, what is the role of the enzyme *Dicer*? Be specific.

11. According to slide 11, what are the component parts of RISC?

12. According to slide 12, how does RISC become activated and what other molecule is needed to drive this activation?

13. Slide 13 explains how RISC degrades mRNA. In your own words, how does it work? From your knowledge of gene expression, how does degrading mRNA interfere with protein production?

14. Study the summary schematic on slide 14. From your knowledge of gene expression, why does this process occur in the cytoplasm?

15. What are two reasons researchers would want to silence genes? Based on your knowledge, hypothesize two additional reasons.

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To complement the Holiday Lectures and enhance their usefulness in the classroom, HHMI produces a variety of free science education materials. Lecture summaries, biographies of the lecturers, and other resources are available at www.holidaylectures.org. DVDs and CD-ROMs can be ordered through HHMI's Catalog at <http://catalog.hhmi.org>.

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