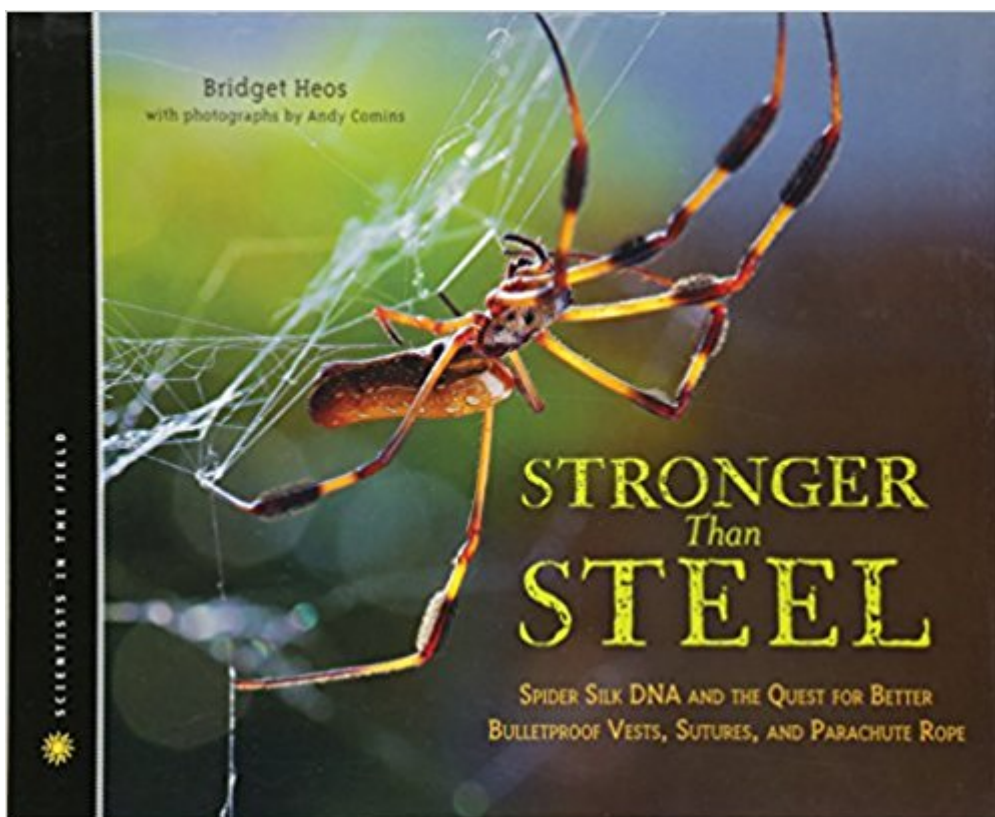


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# Stronger Than Steel: Spider Silk DNA And The Quest For Better Bulletproof Vests, Sutures, And Parachute Rope (Scientists In The Field Series)



## Synopsis

In *Stronger Than Steel*, readers enter Randy Lewis' lab where they come face to face with golden orb weaver spiders, and transgenic alfalfa, silkworm silk, and goats, whose milk contains the proteins to spin spider silk--and to weave a nearly indestructible fiber. Learn how this amazing material might someday be used to repair or replace human ligaments and bones, improve body armor, strengthen parachute rope, and even tether an airplane to an aircraft carrier! Readers explore rapid advancements in the application of genetic medicine and their potential to save and improve lives while considering the crucial ethical concerns of genetic research. A timely addition to the acclaimed *Scientists in the Field* series.

## Book Information

Lexile Measure: 860L (What's this?)

Series: *Scientists in the Field Series*

Hardcover: 80 pages

Publisher: HMH Books for Young Readers (February 26, 2013)

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Average Customer Review: 4.3 out of 5 stars 8 customer reviews

Best Sellers Rank: #704,463 in Books (See Top 100 in Books) #163 in *Books > Children's Books > Science, Nature & How It Works > Inventions & Inventors* #243 in *Books > Children's Books > Education & Reference > Science Studies > Nature > Flowers & Plants* #469 in *Books > Children's Books > Education & Reference > Science Studies > Biology*

Age Range: 10 - 12 years

Grade Level: 5 - 7

## Customer Reviews

Welcome to the lab of Dr. Randy Lewis, where goat embryos are injected with genes from golden orb weaver spiders. When the goats grow up, some of the females will produce spider silk proteins in their milk. The project aims to produce filaments with the varying degrees of strength and flexibility characteristic of spider silk. Practical applications range from space suits to artificial ligaments to lightweight bulletproof vests. A chapter on the "Ethical Concerns and Lifesaving

Possibilities of transgenic organisms lays out ethical objections to the research and counters each one with a response representing Dr. Lewis's point of view. The overall quality of the photos is quite good, and some pictures are exceptionally fine. At times the text seems aimed at very young children, as it includes details and anecdotes that are unlikely to interest older readers. However, the explanations of Lewis's research will be confusing to students without previous knowledge of genetics. While there's worthwhile information here, the presentation limits the audience for this attractive volume from the Scientists in the Field series. Grades 7-10. --Carolyn Phelan

"Move over, Spider-Man. . . . Abundant photographs and a lively narrative make the topic accessible and almost lighthearted, and Heos lays groundwork for readers with a basic introduction to DNA and gene theory." Publishers Weekly, starred review "A complex, controversial topic, positively presented." School Library Journal "Clear focus, careful explanations with occasional repetition of denser information, and a wealth of color photographs make this title inviting and accessible. . . and the kissin'-cute goats should entice quite a few readers to explore this project further." Bulletin of the Center for Children's Books

this covers DNA, RNA and all sorts of other topics you wouldn't expect in a spider book. I think this book is fantastic and perfect for 7-9 year olds interested in science.

This is a very interesting book about using spider silk for different things. I bought this for my 12 yr old grandson and ended up reading it myself. I like the way two scientists explain the process of obtaining the silk and what it is used for. A must read for kids that like science.

Perfect! My son works in a lab with these spiders and this book helped to explain what exactly he does.

Excellent book

This is a very educational perspective of a scientific marvel! The information helps dispel myths and misunderstandings. Wow! Everyone should read this book.

my kid did not enjoy reading this book because she did not find it interesting

I received an ARC copy of this book from Netgalley. When I saw this book's cover, I knew I had to read it. I'm not much of a spider person, but the idea that these creatures are able to produce something stronger than steel was a very interesting concept I wanted to share with my children. This book was surprising in the regard that it had so much information and substance, and yet wasn't boring to read. The author uses a tone that children and young adults will no doubt like. This reads more like an informational conversation than actual learning material. The language used by the author is intelligent and yet not so formal that kids will fall asleep reading it. The photos are really good, closeup shots that show the processes described in the book in action. My children enjoyed looking at the various photos and found them interesting enough to hold their attention. I had not realized before reading this book, how much potential spider silk has and all of the various ways it can be used. I would think this book would be an amazing addition to any school library, or to the personal collection of any older child who has an interest in science.

This sophisticated science book is all about transgenics, a process whereby genes from one species are isolated, modified and then injected into a different species so transgenes can be developed. The objective of this type of science is to find new ways to solve health issues in humans and other animals as well as in the foods we eat. Readers will be fascinated by orb spiders as they spin silk that is stronger than Kevlar (the material used to make bullet-proof vests) and is more flexible than nylon, even in extremely low temperatures. This silk has the potential to be so valuable with so many uses such as bioengineered ligaments and tendons, surgical sutures, parachute rope, bulletproof vests and even space suits. Author Bridget Heos focuses the book on the research of Dr. Randy Lewis, who conducted experiments at the University of Wyoming and currently is a professor at the Utah State University. Since spider silk has so many coveted properties, the focus on the research involves figuring out the best and fastest way to reproduce it. We learn that Orb spiders cannot go to work together in the same space to produce silk, because they would eat each other! Randy Lewis's team is experimenting with spider silk by injecting the gene into goats, so their milk produces silk. The gene does not change the appearance, health or behavior of the goats, only the properties of their milk. There is also research being done on growing silk through alfalfa, the flowering plant, which is a major crop in Wyoming. Essentially the plant is infected with bacteria that contain the spider gene, and then the spider alfalfa grows as sprouts. Dr. Lewis's intriguing research also includes injecting the spider gene into silkworms; unlike spiders, silkworms never eat each other and can produce silk at rapid

rates. What impresses me most about the book is the author does an incredible job explaining the revolutionary science in such a way that young advanced readers can completely understand it. There are comprehensive explanations about DNA, proteins, genes and more that are so educational. I loved reading about the goats and all the possible uses of spider silk too. The photographs in the book by Andy Comins are terrific, especially the close-ups of the spiders and silkworms. I was happy to see that there is a chapter on the ethic of transgenics, as it is a controversial topic. Some people believe the practice is unnatural and immoral because scientists are basically "altering nature." There are animal activists too who believe it is unjust to use them for experimentation. It's so important that children (and adults) learn not only about bioethics, but also understand that many of the foods we buy in our grocery stores have been genetically modified for a variety of reasons. We each must form our own opinions about this science by objectively looking at both points of view for and against transgenics. I've read and reviewed many science books for kids, and can say without a doubt that Stronger than Steel is the most sophisticated and advanced of all those books. It's a fascinating read and the perfect way to introduce your gifted child to transgenics. They can also get a glimpse into the long process of doing scientific research. I have no doubt this book will inspire some very bright children to choose careers in science. It sure made me wish I had a PhD in Molecular Biology!

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