

Science and Culture: Using fiction to make the case for basic research

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What possesses a respected, retired scientist to take on the agonizing task of writing a novel and fighting to get it published? Author Joram Piatigorsky, an emeritus scientist from the National Institute of

Health's National Eye Institute, says quite simply that he had something important to say.

Piatigorsky's novel, *Jellyfish Have Eyes* (1), centers on a scientist who runs into

trouble in an America of the near future that has ever-tightening budgets and a public impatience with basic research. It does not end well for him. And yes, as Piatigorsky discovered in real life and as his fictional protagonist discovers, jellyfish do have eyes.

"Jellyfish have magnificent eyes," Piatigorsky says. "It depends on the species. They have lenses, corneas, retinas." It's not, however, clear what exactly they can see. The best guess is a blurred image, he says, and no one really knows what they might do with that information. Investigating the eyes' function, despite the lack of any practical aim, speaks to the value of basic research.

Piatigorsky comes from an extraordinary family. He is the son of Gregor Piatigorsky, a famed Russian-born cellist. His mother, Jacqueline, was a chess and tennis champion and the daughter of Edouard Alphonse de Rothschild, of the French banking family. "I came from a family of arts and literature," Piatigorsky says. "Humanities in general is in my blood."

Piatigorsky earned a doctorate in biology from the California Institute of Technology in 1967, and began a research career centered on the molecular biology of the eye. He went on to found the Laboratory of Molecular and Developmental Biology at the National Institutes of Health Eye Institute in Bethesda, Maryland.

Piatigorsky's novel tells how Ricardo Sztejn, whose research tracks Piatigorsky's, gets in trouble when he departs from work that clearly has the potential to cure a human disease (Fuch's dystrophy, a corneal disease that can lead to blindness), in favor of studying the vision of jellyfish. Sztejn takes several life-altering field trips to the marine station La Parguera in Puerto Rico to collect specimens.

Because Sztejn, through a series of bureaucratic errors, mistakenly uses public funds for trips that have nothing to do with his grant funding, he faces criminal charges. In real-world America, having to repay the money or perhaps face a fine is generally the worst that can happen. In Piatigorsky's fictional account, Sztejn faces a trial and possible imprisonment.

Like many, Piatigorsky found the process of writing and getting a book published



In *Jellyfish Have Eyes*, Joram Piatigorsky uses fiction to vigorously defend the value of basic research. Image courtesy of Shutterstock/Ilaysen.

excruciating. He prepared 28 revisions over 15 years. The first 100 pages were rewritten extensively. He went through various endings.

Then Piatigorsky sent off letters to 128 literary agents. Only 19 responded and only one wanted to see the manuscript. Piatigorsky finally found a small publisher, International Psychoanalytic Books in New York, which published the work as a paperback.

Scientists writing novels are hardly unheard-of. Carl Sagan's *Contact*, about humanity's first contact with aliens, was a best-seller and later became a movie. Isaac Asimov, a biochemist, might be the most famous example of a scientist novelist.

But Piatigorsky had a different agenda: leverage storytelling to make a point about the importance of funding basic research. It was an aim more in line with the "science in fiction" works of recently deceased chemist and writer Carl Djerassi.

"I have a very strong feeling that science is not a collection of facts," Piatigorsky says. "You have to make the facts into a story of communication . . . The narrative aspect of science is very compelling."

Writing a novel was liberating for Piatigorsky, he says. Unconstrained by the strictures and protocols of science, he felt free to be creative.

Piatigorsky set out to address what he sees as a disturbing trend: antiscience politicians intent on making big cuts to basic research funding. In the book, politicians, pundits, and much of the public want to know what diseases Sztein is trying to cure with jellyfish. Sztein hasn't a clue, and Piatigorsky has his protagonist produce a strong defense of this kind of science.

"I justify my research on delving into the mysteries of Nature because *generally* the experiments yield new insights that benefit people," Sztein testifies in the book. "There's penicillin, recombinant DNA, genetic engineering" (1).

"Bacteria provided the first models for gene regulation, which set the stage for gene therapy," Sztein adds. "Sea slugs—snails without shells—revealed mysteries of memory. Birds have taught us that it's possible to rest half the brain at a time. Think how useful it would be if we could be asleep and active at the same time" (1).

Explaining the value of basic research "was a very important area of the book," Piatigorsky says. He believes that today's tight funding environment has forced would-be basic researchers into the more routine, translational research tasks that don't capitalize on their creativity. He has seen it in his own laboratory, and he has students struggling with it in his book.

"Fiction is a very important weapon. I think scientists should use it in support of basic science," says Joseph Horowitz, a professor of ophthalmology at the Jules Stein Eye Institute at the University of California, Los Angeles. Horowitz is the model for one of Piatigorsky's characters, a friend of Sztein who accompanies him to Puerto Rico and testifies on his behalf.

Horowitz lauds the value of curiosity-driven science and its potentially fascinating—and even useful—unintended consequences. If basic research doesn't get funded, he says, "we will never know what we missed."

1 Piatigorsky J (2014) *Jellyfish Have Eyes* (International Psychoanalytic Books, New York).