



Glowing Genes: A Revolution In Biotechnology

By Marc Zimmer

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Marc Zimmer has written the first popular science book on an amazing new area of biotechnology that will help fight cancer, create new products, improve agriculture, and combat terrorism. For more than one hundred and sixty million years, green fluorescent protein has existed in one species of jellyfish. In 1994 it was cloned, giving rise to a host of useful and potentially revolutionary applications in biotechnology. Today researchers are using this ancient glowing protein to pursue exciting new discoveries, from tracking the process of bacterial infection to detecting chemical and biological agents planted by terrorists. A recognized expert in this field, Zimmer begins with an overview of the many uses of these glowing genes to kill and image cancer cells, monitor bacterial infections, and light up in the presence of pollution. He then discusses the biological reasons that glowing proteins first evolved in jellyfish and fireflies, and looks at the history of bioluminescence and the dedicated scientists who devoted their careers to explaining this phenomenon. The story of how "glowing genes" were located, cloned, and then mass-produced is in itself a fascinating tale.

Zimmer next turns to the serious, and not-so-serious, uses of fluorescent proteins. In agriculture it may soon be possible to produce crops that signal dryness by glowing. In industry a red fluorescent protein originally found in corals may find a use in sheep as a substitute for environmentally harmful wool dyes.

Furthermore, the glowing gene revolution has led to significantly more humane treatment of laboratory animals. No longer must animal lives be sacrificed to understand disease processes; now researchers can observe the spread of cancer and infections by treating animals with green fluorescent genes and similar proteins.

In the fight against terrorism a glowing gene has been created that lights up in the presence of anthrax spores, chemical warfare agents, and landmines. And in a completely different arena, we have already seen the emergence of "transgenic art" in Alba, the fluorescent bunny rabbit.

Glowing Genes is a highly informative, fascinating, and entertaining read about a burgeoning area of biotechnology that promises soon to revolutionize our world.

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Editorial Review

From Publishers Weekly

Green fluorescent pigment (GFP), made naturally by jellyfish, has recently sparked a biological revolution. "GFP is a fantastically useful protein" because it can monitor and track other proteins "inside a living organism, without disrupting any molecular processes." As Connecticut College chemist Zimmer shows, scientists have cloned the gene for GFP and attached it to other genes in a wide array of organisms, from rabbits to monkeys and fish. When these other genes are turned on, GFP is produced and individual cells begin to glow. The diagnostic uses for this technique are critically important and varied. GFP may help with the early diagnosis of cancer, with tracking the spread of pathogenic bacteria and may provide a relatively quick and easy assay for anthrax, among other exciting uses. Additionally, GFP has already helped scientists better understand developmental processes in organisms, which may lead to cures for such diseases as Alzheimer's and Parkinson's. While Zimmer is moderately successful in presenting the excitement associated with these breakthroughs, his clumsy prose often gets in the way of his message. His transitions between topics are so obtuse that much of his text reads like a series of extended digressions. Zimmer is at his best when explaining basic biology and chemistry; as his subject gets more complex, his explanations become more difficult to follow.

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From Booklist

It is the topic of numerous technical papers, reports chemistry professor Zimmer, but it rarely surfaces in the mass media unless the biotechnologists whip up something astonishingly weird. It is green fluorescent protein (GFP), by which fireflies and jellyfish illuminate themselves, and for which the cloners have found numerous potential applications. One of GFP's infrequent references in the news concerned Alba the fluorescent rabbit, displayed as an exhibit of "transgenic art." Drawing attention to this arena of genetic engineering, Zimmer describes what can be done with GFP, whether benevolent (testing the efficacy of disinfectants, replacing radioactive tests as detectors of cancer), frivolous (creating fluorescent pets), or alarming (cloning people in unnatural colors). Acknowledging the dual-edged bioethical ramifications of GFP, Zimmer does not elaborate on them but remains informatively focused on lab research. He also profiles the principal scientists who isolated GFP, found its causative gene, and determined its molecular shape. A timely alert on a fast-changing biotechnology. *Gilbert Taylor*

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From the Inside Flap

GLOWING GENES is the first popular science book on an amazing new area of biotechnology that will help us understand cancer, create new products, improve agriculture, and combat terrorism. For more than 160 million years, green fluorescent protein has existed in one species of jellyfish. In 1994 it was cloned, giving rise to a host of useful and potentially revolutionary applications in biotechnology. Today, researchers are using this ancient glowing protein to pursue exciting new discoveries, from tracking the process of bacterial infection to detecting chemical and biological agents planted by terrorists.

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In the fight against terrorism, genetically modified organisms containing glowing genes have been created that light up in the presence of anthrax spores, chemical warfare agents, and landmines. And in a completely different arena, we have already seen the emergence of "transgenic art" in Alba, the fluorescent rabbit.

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Users Review

From reader reviews:

Richard Stratton:

Do you among people who can't read pleasurable if the sentence chained inside straightway, hold on guys this kind of aren't like that. This Glowing Genes: A Revolution In Biotechnology book is readable by simply you who hate those perfect word style. You will find the facts here are arrange for enjoyable examining experience without leaving also decrease the knowledge that want to deliver to you. The writer connected with Glowing Genes: A Revolution In Biotechnology content conveys objective easily to understand by a lot of people. The printed and e-book are not different in the information but it just different by means of it. So , do you nevertheless thinking Glowing Genes: A Revolution In Biotechnology is not loveable to be your top record reading book?

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Alexandra Robbins:

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