Biodefense: Principles and Pathogens

Edited by Michael S. Bronze and Ronald A. Greenfield
Wymondham, United Kingdom: Horizon Bioscience
838 pp., $335, hardcover

Disclaimer: The opinions and conclusions expressed in this article are solely the views of the reviewer and do not necessarily reflect those of the U.S. Food and Drug Administration.

The 2001 anthrax attacks on the East Coast of the United States, the 1984 release of *Salmonella* bacteria in Oregon, the multiple attempts by the Aum Shinrikyo cult in Japan to use biological weapons, and the regularly-reported threats of Al-Qa’ida and other terrorist movements attempting to use biological agents have demonstrated that the public health sector needs an increased sense of urgency to adequately prepare for bioterrorism events.

One core component of biodefense is continuing education. Physicians, scientists, government officials, and other groups involved in public health need to be constantly aware of current developments in disease pathology, treatments, detection, biological safety, and biosecurity to provide an effective response to bioterrorism attacks. Michael S. Bronze and Ronald A. Greenfield, University of Oklahoma Health Sciences Center in Oklahoma City, Oklahoma, have edited a book about biodefense that assists with this challenge. One of the notable aspects of this text is that its information is current, including many references published in 2005.

*Biodefense: Principles and Pathogens*’ 23 chapters are detailed review articles and the book is actually two different texts in the same volume. The first seven chapters are a general discussion on biodefense, including a history of biological weapons, public health preparedness, public policy and legal issues surrounding terrorism in the U.S., hospital preparedness and infection control, surveillance and detection methods, and psychosocial issues.

The remaining 16 chapters are detailed presentations about biological agents and biological toxins. Most of these chapters have sections on the agent’s history, microbiology, epidemiology, pathogenesis, veterinary manifestations, clinical manifestations in humans, diagnosis, treatment, prognosis, prevention, and research issues. Substances from all three CDC Bioterrorism Agent Categories A, B, C are presented. Chapters about food safety, water safety, agroterrorism, and emerging infectious diseases such as multi-drug resistant tuberculosis and severe acute respiratory syndrome are also included, along with a timely discussion on highly pathogenic avian influenza.

*Biodefense: Principles and Pathogens* is almost entirely text. Although there are few images and tables, those that are included summarize many of the book’s important topics. The limited graphics is not necessarily a disadvantage because *Biodefense: Principles and Pathogens* is basically one large review article. As a result of this format, the book contains more information than tightly-packed chromatin in an eukaryotic cell. If the reader wants to see more graphics, the excellent citations and lists of references should minimize any effort to locate original publications containing the desired graphics.

The first section presents many excellent points on preparedness. For example, the text compares nations such as the United Kingdom and Israel that
have national bioterrorism response plans in place to
the United States which has 50 different plans, one
for each state. Additionally, when discussing the
Strategic National Stockpile of pharmaceuticals and
vaccines, the text cautions that most communities
will be on their own for at least 72 hours until these
supplies can be distributed. It is a sad irony that a
few months after this book was published, the U.S.
was challenged by these issues during the strikes of
Hurricane Katrina and Hurricane Rita. As a result of
those two storms, adjusting the responsibilities of
federal, state, and local agencies when responding to
natural disasters and terrorist attacks and planning
for the degree of self-sufficiency in disaster response
each must assume will likely be often discussed top-
ics over the next several years.

The chapter on surveillance and detection is well
written and lists methods that are both state-of-the-
art and in development. A longer discussion about
the CDC Laboratory Response Network (LRN)
would have been helpful; however, this subject is
addressed in detail on the CDC web site
<www.bt.cdc.gov> and in Biological Weapons Defense:
Principles and Mechanisms for Infectious Diseases
Counter-Bioterrorism by Lindler et al (Humana Press,
December 2004).

The chapters on the agents are comprehensive.
Because of their depth and detail, physicians and
scientists will probably find them more useful than
the general public. As in the first part of the book,
the references continue to be very current and easily
retrievable. The clinical information is written at a
level of detail similar to the PDR Guide to Biological
and Chemical Warfare Response: Diagnosis, Treatment,
Prevention by Sifton et al (Thomson PDR, February
2002) and is oriented toward physicians and other
healthcare personnel. The microbiology sections are
in-depth summaries of current knowledge. The re-
search issues presented at the end of each agent’s
chapter list several new treatment strategies in develop-
ment.

The first half of the book could have been ex-
panded. These chapters offer only an overview of
bioterrorism preparedness; however, they do provide
a solid launching pad for further investigation into
this topic, and the long lists of references make finding
information on this subject easier.

The food safety, water safety, and agroterrorism
chapters would have been more useful if they were
longer, too. However, this observation is not actually
a weakness of the book. As mentioned above, the
text is meant to be a review of biodefense. The rela-
tively small size of these sections is most likely
the result of most efforts in biodefense and infec-
tious diseases being focused on higher-level threats.
Longer reviews will likely appear when research ef-
forts in these areas are increased.

The main disadvantage of Biodefense: Principles
and Pathogens is the cost, which is higher than many
biodefense and biology books available today. In-
cluding an electronic version of the book on a CD-
ROM, similar to Biological Weapons Defense: Principles
and Mechanisms for Infectious Diseases Counter-
Bioterrorism, would have been a helpful addition. An-
other option would have been access to a Web site
that has book updates similar to Molecular Cloning: A
Laboratory Manual by Sambrook and Russell (Cold
Spring Harbor Laboratory Press, January 2001). Again,
the lists of references at the end of each chap-
ter are quite valuable, saving readers a great deal of
time on literature searches.

Biodefense: Principles and Pathogens is a good
primer on current issues in biodefense. Although it
will be most beneficial to physicians and researchers,
the text will also be helpful to biological safety pro-
fessionals, especially when performing risk assess-
ments. It will be a nice addition to any biodefense,
infectious disease, or biological safety library.

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