UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

OAKLAND DIVISION

VIETNAM VETERANS OF AMERICA, a Non-Profit Corporation; SWORDS TO PLOWSHARES: VETERANS RIGHTS ORGANIZATION, a California Non-Profit Corporation; BRUCE PRICE; FRANKLIN D. ROCHELLE; LARRY MEIROW; ERIC P. MUTH; DAVID C. DUFRANE; WRAY C. FORREST; TIM MICHAEL JOSEPHS; and WILLIAM BLAZINSKI, individually, on behalf of themselves and all others similarly situated,

Plaintiffs,

v.

CENTRAL INTELLIGENCE AGENCY; DAVID H. PETRAEUS, Director of the Central Intelligence Agency; UNITED STATES DEPARTMENT OF DEFENSE; LEON PANETTA, Secretary of Defense; UNITED STATES DEPARTMENT OF THE ARMY; JOHN MCHUGH, United States Secretary of the Army; UNITED STATES OF AMERICA; UNITED STATES DEPARTMENT OF VETERANS AFFAIRS; and ERIC K. SHINSEKI, UNITED STATES SECRETARY OF VETERANS AFFAIRS,

Defendants.

Case No. CV 09-0037-CW

EXPERT REPORT OF RONALD ALAN GREENFIELD, M.D., M.S., F.A.C.P., F.I.D.S.A.

I. INTRODUCTION

A. Retention

1. I have been retained by Morrison & Foerster LLP on behalf its clients, plaintiffs in this matter, Vietnam Veterans of America, Swords to Plowshares: Veterans Rights Organization, Bruce Price, Franklin D. Rochelle, Larry Meirow, Eric P. Muth, David C. Dufrane, Wray C. Forrest, Tim Michael Josephs, and William Blazinski (collectively "Plaintiffs") to serve as a consultant and expert witness in the above captioned action.

2. I expect to testify at trial regarding the matters discussed in this expert report, and in any supplemental reports or declarations that I may prepare for this matter. I may also testify at trial regarding matters related to my opinions addressed by any expert or fact witness testifying on behalf of Plaintiffs or Defendants Central Intelligence Agency; David H. Petraeus, Director of the Central Intelligence Agency; United States Department of Defense; Leon Panetta, Secretary of Defense; United States Department of the Army; John McHugh, United States Secretary of the Army; United States Department of Veterans Affairs; and Eric K. Shinseki, United States Secretary of Veterans Affairs (collectively "Defendants"), including but not limited to any reports, testimony, exhibits, references, or demonstratives presented by Defendants.

3. I reserve the right to supplement or amend this report if additional facts and information that affect my opinions become available. It is my understanding that Plaintiffs have retained other experts and that Defendants may serve an expert report concerning one or more of the issues I address in this report. I reserve the right to testify concerning such other reports or testimony, and to respond to any such report from Defendants' expert(s) and to rebut at trial any opinions expressed in such a report. I also understand that depositions of additional fact witnesses may take place and that Defendants have just recently produced or will be producing additional documents that are still undergoing review. Furthermore, it is my understanding that Defendants have produced, and continue to produce, a substantial quantity of documents and other information in formats that are inaccessible or exceedingly difficult to access or evaluate properly, and that Plaintiffs' counsel is continuing to attempt to convert such information into a usable format. Should Plaintiffs' counsel's efforts be successful and information from these

sources become available to me I reserve the right to supplement this report to incorporate that information.

4. The headings in this report have been added to create sections for ease of organization. I do not intend these headings to be in any way restrictive of the information contained in the respective sections.

B. Compensation

5. I am being compensated for my work on this matter at my customary rate of $200 per hour, plus expenses. I am being compensated for travel time at a rate of $100 per hour up to a daily maximum of $600. My compensation is not conditioned on the substance of my opinions, testimony at deposition or trial, or the outcome of this matter.

II. MY BACKGROUND AND QUALIFICATIONS

6. I earned my Bachelor of Science degree in psychology *cum laude* and with distinction in 1972 from The Ohio State University. I completed medical school at the State University of New York – Upstate Medical Center (currently State University of New York Upstate Medical University), obtaining my M.D. in 1977. Following medical school, I performed my internship (1977-1978) and residency (1978-1980) in internal medicine at the University of Wisconsin Hospitals, where I was also a fellow in infectious diseases (1980-1982). I also completed a Master of Science in Biostatistics at the University of Oklahoma College of Public Health in 1993.

7. Since 1982, I have been a Staff Physician at the OU Medical Center in Oklahoma City. From 1982 to 2011, I was a Staff Physician at the Department of Veterans Affairs Medical Center also in Oklahoma City.

8. In 1982, I began my academic career at the University of Oklahoma College of Medicine. I have been a Professor in the Department of Medicine since 1994 and was previously Assistant Professor from 1982 to 1988 and Associate Professor from 1988 to 1994. I am also currently an Adjunct Professor in the Department of Biostatistics and Epidemiology, College of Public Health. From 1995 to 2008, I served as Chief of the Infectious Disease Section after

serving as Acting Chief (1994-1995) and Vice-Chief (1989-1994). From 2002 to 2009, I was Director of HIV Services.

9. I am certified by the American Board of Internal Medicine with subspecialty certifications in infectious diseases and internal medicine. I currently hold an Oklahoma medical license. I am a Fellow in the American College of Physicians and the Infectious Disease Society of America.

10. A major focus of my work has been the research and development of public health services related to infectious diseases such as HIV/AIDS.

11. Another major focus of my work has been the study of infectious diseases caused by pathogens which could be used as agents of biological warfare. I have edited a textbook on defense from biological weapons with Michael S. Bronze titled *Biodefense: Principles and Pathogens* (Horizon Sciences, 2005), which included chapters I authored or co-authored ("Introduction," "Anthrax," and "Diseases Due to Other Category B Bacterial Pathogens II: Psittacosis, Q Fever, and Typhus"). I have also edited a symposium on bioterrorism with Michael Bronze which was published in the The American Journal of the Medical Sciences in June 2002 (Volume 32(6):289-357) and included several of my own publications, such as "Symposium Introduction: Bioterrorism," "Bacterial Pathogens as Biological Weapons and Agents of Bioterrorism," "Viral Agents as Biological Weapons and Agents of Bioterrorism," "Microbiological, Biological and Chemical Weapons of Warfare and Terrorism," and "Unconventional Biological Threats and the Molecular Biological Response to Biological Threats." Other related biodefense publications include "Anthrax," "The Potential Role of Viral Pathogens as Agents of Bioterrorism," "Biological Toxins as Potential Agents of Bioterrorism," and "Other Bacterial Diseases as a Potential Consequence of Bioterrorism: Q Fever, Brucellosis, Glanders, and Melioidosis"—all of which appeared in the Journal of the Oklahoma State Medical Association from 2002-2003 as part of a symposium I edited with Michael Bronze.

12. I have published more than 26 original research articles in peer reviewed journals, 57 review articles, and 22 book chapters. I have been invited to present my research work at numerous professional meetings both in the United States and internationally. A current copy of

my *curriculum vitae* is attached hereto as Exhibit 1, which includes a complete list of my publications to date.

13. I have not testified as an expert witness in any matter in the last four years.

III. BASIS AND SCOPE OF MY OPINIONS

14. I have been asked to provide an overview of the pathophysiological effects, including long-term adverse health effects, on the human body of various biological agents studied in testing programs conducted by Defendants. These biological agents include, for example, *Coxiella burnetii* (the causative agent for Q fever) and *Francisella tularensis* (the causative agent for tularemia). In addition, I have been asked to opine about whether service members exposed to these biological agents in the biological weapons testing programs operated by Defendants during the last century can reasonably be expected to develop adverse long-term health problems as a result. I may testify about any or all of these topics and all the subject matter discussed in this report.

15. In arriving at my opinions, expressed in detail in this report, I have relied on my personal and professional experience as well as various additional resources. I have relied upon the types of information and resources that are normally relied upon by experts in my field, such as articles in peer reviewed journals, treatises and similar scholarly works, and published reports regarding the testing programs at issue.

16. I have also reviewed documents from various other sources which contain reports and accounts of actual tests involving biological agents. These documents were helpful to my understanding of the circumstances surrounding the experiments performed in the various testing programs and example test protocols used.

17. These are some of the primary references I have reviewed and relied upon in reaching my opinions; a complete list of documents I have consulted and considered is included as Exhibit 1 to this report. Throughout my report I have cited specific documents, and portions of those documents, to illustrate technical and historical points. These citations are only illustrative, not exhaustive, and I may rely on other specific portions of these documents, as well as any of the references listed in Exhibit 2 to support any of these points. Moreover, to the extent Defendants

provide an expert report responding to any of the points addressed in this report, I reserve the right to consider, comment on, or rely on any documents referenced in any such report.

18. I reserve the right to provide further exhibits to be used as a summary of, or as support for, my opinions or testimony, including any testimony by experts or other witnesses at trial.

IV. LONG-TERM HEALTH EFFECTS OF ACUTE EXPOSURE TO BIOLOGICAL WARFARE AGENTS

19. Acute exposure to biological warfare agents can cause long-term adverse health effects in at least two ways.

20. Acute exposure to some biological warfare agents can result in a chronic, persistent infection leading to long-term adverse health effects. One of the best examples of this is Q-fever.

21. Acute exposure to other biological warfare agents can result in acute adverse reactions that have chronic, long-term health effects. A good example of this is tularemia.

V. ACUTE INFECTIONS RESULTING IN PERSISTENT INFECTION AND LONG-TERM ADVERSE HEALTH EFFECTS

22. The agent that causes Q fever, *Coxiella burnetii*, is perhaps the best illustrative example of a highly infectious organism that can persist for decades as a chronic infection, potentially causing serious long-term adverse health effects.

A. Q Fever

23. It is my understanding that some U.S. military personnel who served as test subjects in the government's biological warfare program were exposed to *C. burnetii*.[1] (Pittman at 185.)

[1] E.g., P. Pittman *et al.*, "An Assessment of Health Status Among Medical Research Volunteers Who Served in the Project Whitecoat Program at Fort Detrick, Maryland," *Military Medicine* 170:183-187 (2005) (counting 58 individuals exposed to *Coxiella burnetii* during the Project Whitecoat program at Fort Detrick, Maryland) (hereinafter, "Pittman").

1. Background

24. Q fever is an infectious disease caused by the organism, *C. burnetii.* First described in 1937, Q fever can spread from animals (primarily livestock) to humans and is highly infectious.[2] (Wendel at 500.) Indeed, the infectious dose for 50% of humans (ID_{50}) is 1 to 10 organisms. (*Id.*) In other words, just a single organism may initiate an infection and disease in a human.[3] Human infection with *C. burnetii* is usually acquired through inhalation. It is the highly infectious properties of *C. burnetii* that makes this organism of interest as a biological weapon. (Byrne at VET004_000863.)

25. *C. burnetii* can persist as a chronic infection for more than a decade. Indeed, no upper limit in length of persistence has been established for chronic *C. burnetii* infection.[4]

2. Acute Illness: Q Fever

26. Acute infection with *C. burnetii* is often asymptomatic. When symptoms do occur, they usually develop within 1 to 3 weeks following exposure. (Wendel at 502.) Q fever can produce flu-like symptoms, including fatigue, fever, myalgias, chills, and headache. (*Id.*) Symptoms often resolve spontaneously within 2 to 3 weeks. While the symptoms of Q fever can be relatively benign, they are not always so. (Byrne at VET004_000868-869.)

27. The clinical manifestations of Q fever can be more serious. Acute manifestations of Q fever may include fever, skin rashes, hepatitis (inflammation of the liver), pneumonia, hepatitis with pneumonia, meningitis or meningoencephalitis (i.e., inflammation of the

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[2] K. Wendel, "Disease Due to Other Category B Bacterial Pathogens II: Psittacosis, Q Fever, and Typhus," A Chapter in: *Biodefense: Principles and Pathogens*, Edited by M. Bronze and R. Greenfield, Horizon Biosciences (2005) (hereinafter, "Wendel").

[3] W. Byrne, "Q Fever," A Chapter in: *Medical Aspects of Chemical and Biological Warfare (Textbook of Military Medicine)*, Edited by F. Sidell *et al.*, Office of the Surgeon General (1997) (hereinafter, "Byrne").

[4] The National Academies, "Health Effects of Project SHAD Biological Agent *Coxiella burnetii* [Q-Fever]," April 2004.

membranes covering the brain and/or inflammation of the brain itself), pericarditis (i.e., inflammation of the membranes around the heart), myocarditis (inflammation of the heart muscle), and peripheral neuropathy (i.e., injury to the nerves of the peripheral nervous system). (Wendel at 502-503.) Neurologic complications are relatively common and may include motor and sensory impairment as well as visual and auditory hallucinations.

3. Chronic Illness: Q Fever

28. Chronic Q fever is less common (less than 1% of those infected with *C. burnetii*) and may develop months or years following the initial exposure. (Wendel at 503.) The most common manifestation of chronic Q fever is endocarditis (i.e., inflammation of the inside lining of the heart chambers and heart valves). (*Id.*) Chronic Q fever endocarditis can result in symptoms and signs of left heart failure due to involvement of the mitral and/or aortic valves of the heart; it is a potentially life-threatening condition. (*Id.*) In addition, chronic Q fever endocarditis can cause an enlarged liver (hepatomegaly) and an enlarged spleen (splenomegaly). (*Id.*) Blood clots can also form within the heart and embolize (i.e., break off and travel "downstream" through an artery), potentially causing limb ischemia or stroke or damage to other vital organs. (*See id.*)

29. Chronic Q fever may also cause hepatitis (inflammation of the liver) resulting in elevated liver enzymes and even jaundice. (*See id.*)

30. Other potentially serious clinical manifestations of chronic Q fever include infections within blood vessels (endovascular infections), infections in bone (osteomyelitis), and infections in joints (septic arthritis). (Wendel at 504.)

31. While acute Q fever can cause pneumonias, chronic Q fever has the potential to cause pulmonary fibrosis (scarring of lung tissue) that can result in a marked decrease in lung function. (*See id.*) Other potential complications of chronic Q fever include infections of the central nervous system and peripheral neuropathies.

4. Diagnosing Chronic Q Fever

32. Many individuals with chronic Q fever are unaware that they are infected with *C. burnetii*, and many physicians fail to consider and to test for the disease.

33. *C. burnetii* can be cultured from a number of different tissue specimens, including blood and tissue biopsies, albeit in specialized laboratories. (*Id.*) Serologic assays (ELISA) are also available to diagnose chronic Q fever infection and are more generally available. (Byrne at VET004_000870.) Immunofluorescence tests and PCR tests are also available for diagnosing chronic Q fever. (Wendel at 505.)

34. Any individual presenting with symptoms or signs of endocarditis or any of the long-term health complications discussed above, and who has a known history of exposure to *C. burnetii*, should be tested for chronic Q fever.

5. Treating Chronic Q Fever

35. Chronic Q fever, like acute Q fever, is readily treatable using antibiotics. In addition, supportive and therapeutic care can be targeted at some of the specific complications of long-term chronic Q fever (e.g., endocarditis, hepatitis, and joint infections).

6. Conclusions

36. Because of the highly infectious properties of *C. burnetii*, exposure to even a single organism during biological warfare testing can lead to an acute infection and/or possibly serious chronic complications, including endocarditis, hepatitis, osteomyelitis, and pulmonary fibrosis.

37. With proper medical care and knowledge of prior exposure to *C. burnetii*, chronic Q fever is readily diagnosable and can often be treated with some measure of success.

B. Another Illustrative Example—Brucellosis

38. Brucellosis is caused by the *Brucellae* genus of bacteria and is another good illustrative example of an acute infectious disease that can develop into a chronic infection with

long-term adverse health effects.[5] Only 10 to 100 aerosolized organisms are required to cause disease. (Voskuhl at 456.) In 1954, *Brucella suis* became the first biological agent weaponized by the United States. (*Id.*) Human brucellosis may be divided into acute (<2 months), subacute (2-12 months) and chronic (> 1 year) forms. (Voskuhl at 461.) Brucellosis is a systemic infection that can potentially impact any organ or system in the body. (*Id.*)

39. Acute symptoms tend to be non-specific and may include fever, anorexia, weight loss, malaise, profound fatigue, myalgias, arthralgias, mental inattention, and depression. (Voskuhl at 461-462.)

40. Complications from chronic infections may include gastrointestinal complaints (e.g., nausea, vomiting, diarrhea), liver problems, joint disorders (e.g., septic arthritis), depression, peripheral neuropathy, radiculopathy, stroke, subarachnoid hemorrhage (bleeding in a space around the brain), meningitis, brain abscess, and encephalitis. Endocarditis occurs in some cases and is a major cause of death from brucellosis. (Voskuhl at 462-463.)

VI. INFECTIONS CAUSING ACUTE INJURIES WITH CHRONIC SEQUELAE

41. The organism that causes tularemia, *Francisella tularensis* (formerly called, *Pasteurella tularensis*), is one of the best examples of a highly infectious organism that can cause serious acute injuries with significant chronic sequelae.

A. Tularemia

42. It is my understanding that some U.S. military personnel who served as test subjects in the government's biological warfare program were exposed to *F. tularensis*. (Pittman at 185.) It is also my understanding that at least some of the test subjects were exposed to an

[5] G. Voskuhl *et al.*, "Diseases Due to Other Category B Bacterial Pathogens I: Brucellosis, Glanders, and Melioidosis," A Chapter in: *Biodefense: Principles and Pathogens*, Edited by M. Bronze and R. Greenfield, Horizon Biosciences (2005) (hereinafter, "Voskuhl").

inhalational form of *F. tularensis*.[6] It is the inhalational form of *F. tularensis* that is most likely to be used for biological warfare.

1. Background

43. Tularemia is caused by *F. tularensis*, "one of the most infectious pathogenic bacteria known...."[7] It takes fewer than ten organisms to cause disease.[8] (Dennis at 2763; Machado at 313.) *F. tularensis* has long been studied as a potential biological weapon, and inhalation as an aerosol has long been considered one of the most dangerous routes of exposure. (Dennis at 2764-2765; Machado at 325-326.)

44. *F. tularensis* can infect humans through exposures of the skin, mucous membranes, gastrointestinal tract, and lungs. (Dennis at 2766.) Infection through the pulmonary route can be devastating, because the "initial tissue reaction to infection is a focal, intensely suppurative necrosis (tissue death) ...." (*See* Dennis at 2766.)

2. Acute Illness: Tularemia

45. The onset of tularemia is usually abrupt. (Machado at 323.) Initial symptoms and signs tend to be general and non-specific: fever, headache, chills, rigors, body aches, nausea, vomiting, cough, and sore throat. (Dennis at 2767.)

46. When exposed to *F. tularensis* as an aerosol and inhaled, some individuals can be incapacitated by tularemia within one or two days of illness. (*Id.*) Pulmonary infection can lead to pleural effusions (excessive fluid in the fluid-filled space surrounding the lungs), a severe pneumonia, respiratory failure, and even death. (Dennis at 2768; Machado at 326.)

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[6] E. Bachtell, "Respiratory Virulence of Aged Aerosols of Pasteurella Tularensis SCHU-S4 for Man," Technical Evaluation Division, May 16, 1962 (hereinafter, "Bachtell").

[7] D. Dennis *et al.*, "Tularemia as a Biological Weapon: Medical and Public Health Management," *Journal of the American Medical Association* 285(21);2763-2773 (2001) (hereinafter, "Dennis").

[8] L. Machado *et al.*, "Tularemia," A Chapter in: *Biodefense: Principles and Pathogens*, Edited by M. Bronze and R. Greenfield, Horizon Biosciences (2005) (hereinafter, "Machado").

47. In addition to local effects, an infected individual could develop a widespread tularemia sepsis, eventually leading to septic shock, a large decrease in blood pressure, and possibly injury to multiple organ systems. (Dennis at 2768.) Sepsis can also lead to disseminated intravascular coagulation ("DIC") and uncontrolled clotting and bleeding. (*Id.*)

3. Chronic Sequelae of Tularemia

48. The chronic sequelae of tularemia are largely related to the residual effects of acute injuries caused by the infection. For example, a severe pneumonia could result in fibrosis of lung tissue and decreased lung function. Pleural effusions could lead to fibrotic changes in the pleural membranes surrounding the lungs, also impairing lung function. Septic shock can cause permanent injuries to organs such as the liver, kidneys, and gastrointestinal tract. If DIC develops acutely, uncontrolled clotting could lead in some cases to limb ischemia.

4. Diagnosis of Tularemia

49. Diagnosis of acute infections of tularemia can be performed using cultures and direct fluorescent antibody tests. (Machado at 322.) Antibody titers can be evaluated to assess for earlier infections. (Machado at 322-323.)

5. Treatment of Tularemia

50. A number of antibiotics are active against tularemia. Treatment for permanent organ injuries (e.g., pulmonary fibrosis) can be challenging and may consist largely of supportive care and physical therapy.

6. Conclusions

51. Even exposure to a few *F. tularensis* organisms may result in an acute infection in test subjects exposed during biological warfare testing.

52. It is known that aerosols of *F. tularensis* were evaluated as potential biological weapons in U.S. military experiments. (Bachtell at 1.) The pneumonic (inhalational) route of administration is potentially the most dangerous, and it is possible that test subjects exposed to

aerosols of *F. tularensis* developed serious pulmonary infections as a complication of exposure. (*See* Machado at 325-326.)

53. It is possible that test subjects who developed severe acute infections due to *F. tularensis* exposure are now suffering from significant chronic sequelae.

B. Other Illustrative Examples

54. Other illustrative examples of biological agents that can cause acute injuries with potential chronic sequelae include Venezuelan equine encephalitis virus ("VEEV"), anthrax, and plague (e.g., *Yersinia pestis*). I will briefly discuss these other agents.

55. Venezuelan equine encephalitis virus in the acute phase can cause high fever, lethargy, seizures, focal neurologic deficits, confusion, ataxia (i.e., problems with muscle coordination), nausea, vomiting, headache, and photophobia (abnormal sensitivity to light). One of the most problematic complications is severe encephalitis (inflammation of the brain) that can lead to chronic seizure disorders and permanent brain damage.[9]

56. Anthrax has been considered one of the most serious threats as a potential biological weapon.[10] The causative organism, *Bacillus anthracis*, has been known since antiquity, and human clinical disease can occur in cutaneous, gastrointestinal, and inhalation forms, with the inhalation form being the most dangerous in a bioterrorism context.[11] (Greenfield at 165.) Inhalational anthrax may occur with the inhalation of a small number of spores, which can reach the bronchioles and alveoli of the lungs. (Greenfield at 175.) Initial signs and symptoms of inhalational anthrax may be non-specific—e.g., fever, chills, malaise, lethargy, nausea and vomiting. (Greenfield at 185.) Anthrax could then develop into a systemic "toxemia"

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[9] M. Bronze *et al.*, "Encephalitis Viruses as Potential Agents of Bioterrorism," A Chapter in: *Biodefense: Principles and Pathogens*, Edited by M. Bronze and R. Greenfield, Horizon Biosciences (2005).

[10] T. Inglesby *et al.*, "Anthrax as a Biological Weapon: Medical and Public Health Management," *Journal of the American Medical Association* 281(18):1735-1745 (1999).

[11] R. Greenfield *et al.*, "Anthrax," A Chapter in: *Biodefense: Principles and Pathogens*, Edited by M. Bronze and R. Greenfield, Horizon Biosciences (2005) (hereinafter, "Greenfield").

that can affect multiple organ systems and result in shock and meningoencephalitis (inflammation of the brain and the tissues surrounding the brain). Individuals, who do not succumb to coma and death, could develop chronic health problems affecting multiple organ systems. Seizure disorders, pulmonary disorders and reduced lung function, neurologic deficits, and psychological problems are just a few of the possible chronic sequelae. (Greenfield at 182-186.)

57. *Yersinia pestis* is the causative agent of plague. Disease caused by this bacteria has been documented throughout human history.[12] As a biological weapon, *Y. pestis* could be aerosolized for inhalational transmission. (Drevets at 249.) Human infection can take the form of "classic" bubonic plague, primary septicemic plague, and pneumonic plague. (Drevets at 262.) In some patients, acute illness can result in endotoxic shock and a systemic inflammatory syndrome that can affect multiple organ systems and result in permanent injuries to those organs. (Drevets at 263.) Uncontrolled clotting and bleeding caused by disseminated intravascular coagulation can cause tissue ischemia (hence the origin of the term, "Black Death", referring to ischemic, cyanotic tissue) and gangrene. (*Id.*) Pneumonic plague can result in hemorrhage within the lungs, severe pulmonary damage, and chronic reductions in lung function. (Drevets at 265.) A large portion of afflicted individuals may die from any form of the disease. (*Id.*)

VII. HEALTH EFFECTS OF PERCEIVED AND ACTUAL EXPOSURE TO BIOLOGICAL WARFARE AGENTS

58. While I am not a psychiatric expert, I have seen patients in my clinical practice who have experienced adverse psychological effects following a severe infectious disease episode. I would expect to see similar adverse psychological effects in test subjects who experienced serious adverse reactions following exposure to biological warfare agents such as those discussed in this report.[13]

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[12] D. Drevets, "Plague," A Chapter in: *Biodefense: Principles and Pathogens*, Edited by M. Bronze and R. Greenfield, Horizon Biosciences (2005) (hereinafter, "Drevets").

[13] *See, e.g.,* The National Academies, "Supplement: Health Effects of Perceived Exposure to Biochemical Warfare Agents," April 2004.

Respectfully submitted,

Dated: 8/8, 2012

Ronald Alan Greenfield, M.D., M.S.

EXHIBIT 1

CURRICULUM VITAE

RONALD ALAN GREENFIELD, M. D., M. S., FACP, FIDSA

I. Personal Data

Business address: University of Oklahoma Health Sciences Center
College of Medicine
Department of Medicine
920 Stanton L. Young Blvd.
Williams Pavilion - 1360
P.O. Box 26901
Oklahoma City, Oklahoma 73104-5033

II. Education and Training

Graduate: 1987-1993	University of Oklahoma College of Public Health Department of Biostatistics and Epidemiology Master of Science in Biostatistics, August, 1993
Fellowship: 1980-1982	Infectious Diseases University of Wisconsin Hospitals, Madison, WI (Dennis G. Maki, M. D., Section Chief, Jeffrey M. Jones, M. D., Ph. D., principal research mentor)
Internship & Residency: 1977-1980	Internal Medicine University of Wisconsin Hospitals, Madison, WI
Professional: 1973-1977	State University of New York - Upstate Medical Center, Syracuse, NY (currently State University of New York Upstate Medical University) Doctor of Medicine, May, 1977
Undergraduate: 1969-1972	The Ohio State University, Columbus, OH Bachelor of Science *cum laude* and with Distinction in Psychology, December, 1972

III. Professional experience

Academic positions:

Professor, 1994 - present
Department of Medicine, College of Medicine
University of Oklahoma Health Sciences Center, Oklahoma City, OK
(previously Associate Professor, 1988 - 1994)
(previously Assistant Professor, 1982 - 1988)

Administrative positions:

Chief, Infectious Diseases Section, 1995 - 2008
(Vice-Chief, Infectious Diseases Section, 1989 – 1994 and Acting Chief, Infectious Diseases Section, 1994 – 1995)

Director of HIV Services, 2002 - 2009

Hospital positions:

Staff Physician (1982 – present), Medical Service
OU Medical Center, Oklahoma City, OK

Previous hospital positions

Staff Physician (1982 - 2011), Medical Service
Department of Veterans Affairs Medical Center, Oklahoma City, OK
retired

Editorial positions:

Managing Editor, eMedicine Journal: Medicine, Surgery, and Psychiatry.
2000 – present

Chief Editor, HIV Section, eMedicine Journal: Medicine, Surgery, and Psychiatry, 2007 - present

Other health services positions

Member, Oklahoma State Department of Health, Hospital Preparedness Advisory Committee, 2002 – present

Member, Epidemic Intelligence Network, Infectious Diseases Society of America, 2004 – present

Member, ABC News Medical Unit, 2004 – present

Member, MRSA in Community Settings Working Group, Oklahoma State Department of Health, 2008 – present

IV. Professional certifications

Diplomate Certified in the Subspecialty of Infectious Diseases (#75183)
American Board of Internal Medicine, 1982

Diplomate Certified in the Specialty of Internal Medicine (#75183)
American Board of Internal Medicine, 1980

V. Medical licensure

Oklahoma (since 1982) (#13686)

Previously Wisconsin (1978 - 1982)

VI. Professional memberships (year of original membership)

American College of Physicians (1981, Fellow* 1990)
American Federation for Medical Research* (1981)
American Society for Microbiology (1980)
Central Society for Clinical Research* (1991)
College of Public Health Delta Omega Society, Xi Chapter* (1993)
Infectious Diseases Society of America (1985, Fellow* 1991)
International Society for Human and Animal Mycology (1983)
Medical Mycologic Society of the Americas (1983)
Phi Beta Kappa* (1973)
Southern Society for Clinical Investigation* (2005)
Southwest Association of Clinical Microbiology (1986)

*elected

VII. Awards and Honors

Richard May Award for dedication and service, Oklahoma AIDS Care Fund, Inc., March, 2011.

Silver Pillar Award For Outstanding Patient Service, November, 2010

Special Contributions Award presented by the Faculty of The Department of Biostatistics and Epidemiology, College of Public Health, University of Oklahoma Health Sciences Center, May, 2010

Guide to America's Top Physicians, Consumers' Research Council of America, 2009, 2010, 2011

Charlotte S. Leebron Memorial Trust Fund Award from the Oklahoma State Medical Association for scientific paper "most worthy" in the Journal of the Oklahoma State Medical Association. 1993, 2007

Oklahoma's Top Doctors, 2007, as published in Oklahoma Magazine, 2007, 2009

America's Best Doctors 2000, 2002, 2004, 2005-2006, 2007-2008, 2009-2010

International Biographical Center Leading Scientists of the World, 2005

Guardian Angel 2003, Latino Community Development Agency, Oklahoma City

Who's Who in Medical Sciences Education, 2005

Who's Who in the Southwest

Who's Who in Science and Engineering

Who's Who in Medicine and Healthcare

International Who's Who of Professionals

VIII. Public Health and Research and Development Activities

Public health grants awarded and completed

1. Program Director, "Comprehensive early intervention service / primary care service delivery program for indigent / low-income persons in the Oklahoma City metropolitan statistical area and surrounding 405 and 580 area codes". HIV/AIDS Bureau, Health Resources and Services Administration, Public Health Service, United States Department of Health and Human Services, 10/1996 – 12/2009 (A Ryan White Part C Program under Title XXVI of the PHS Act as amended by the Ryan White HIV/AIDS Treatment Modernization Act of 2006). Program and grant (grant continues to 2011) continues under different leadership.

2. Program Director, "Coordinated HIV services and access to research for children, youth, women, and their families". HIV/AIDS Bureau, Health Resources and Services Administration, Public Health Service, United States Department of Health and Human Services, 8/2001 – 7/2008 (A Ryan White Part D Program under Title XXVI of the PHS Act as amended by the Ryan White HIV/AIDS Treatment Modernization Act of 2006). Program and grant (grant continues to 2012) continue under different leadership.

3. Program Co-director with Philip Keiser, M. D. (Medical Director, Parkland HIV/AIDS Clinic, and Professor of Medicine, University of Texas Southwestern Medical Center, Dallas, TX), Texas and Oklahoma Regional AIDS Education and Training Center. HIV/AIDS Bureau, Health Resources and Services Administration, Public Health Service, United States Department of Health and Human Services, 6/1999 – 5/2008, currently (A Ryan White Part F Program under Title XXVI of the PHS Act as amended by the Ryan White HIV/AIDS Treatment Modernization Act of 2006). Program and grant (grant continues to 2011) continue with Linda Salinas, MD, as Co-director.

4. Co-investigator with Daniel Boatright, Ph. D., Department of Environmental and Occupational Health, OUHSC College of Public Health (principal investigator), Southwest Center for Public Health Preparedness, Centers for Disease Control and Prevention, United States Department of Health and Human Services, 2002 – 2008, 0.10 FTE.

Public health contracts awarded and completed

1. Program Director, "Ryan White Program Part B Services for the Western Region of Oklahoma", subcontract from Oklahoma State Department of Health, grantee for Ryan White Part B Program for the State of Oklahoma, 2004 – present. Program and contract continues under different leadership.

2. Program Director, "Comprehensive Risk and Counseling Services for the Western Region of Oklahoma", subcontract from Oklahoma State Department of Health grant for "Comprehensive Risk and Counseling Services", Center for Disease Control and Prevention, United States Department of Health and Human Services, 2004 – present. Program and contract continues under different leadership.

3. Program Director, "HIV Adolescent Curriculum", Oklahoma State Department of Education, 2007 - 2009.

4. Program Director, "HIV/AIDS Training and Technical Assistance Contract", Oklahoma Department of Mental Health and Substance Abuse, 2007 - 2008.

Research grants awarded and completed

1. Local principal investigator, VA Study #HIS-99042-1, "Measuring HIV Quality of Care". Steven M. Asch, MD, MPH, principal investigator (Staff physician, VA Greater Los Angeles Healthcare Systems), 2000 – 2002.

2. Local co-principal investigator with L. D. Beck, M. D., and C. Gentry, Pharm. D., "Antibiotic treatment of Gulf War Veterans' Illnesses", Department of Veterans Affairs Cooperative Study #475, 1999 - 2001.

3. Principal investigator, "Host defense systems in gastrointestinal candidiasis", Department of Veterans Affairs Merit Review Grant, 1995 - 1998.

4. Collaborating investigator with T. L. Kuhls, M. D., "*Cryptosporidium parvum* - enterocyte interactions", National Institutes of Health - National Institute of Allergy and Infectious Diseases Young Investigator Award (T. L. Kuhls), 1991 - 1996.

5. Principal investigator, "Host defense systems in *Candida albicans* infections", Department of Veterans Affairs Merit Review Grant, 1992 - 1995.

6. Principal investigator, "Pathobiology of cryptosporidiosis", Oklahoma Center for Advancement of Science and Technology, Health Research Program Grant, 1991 - 1994.

7. Coprincipal investigator with J. W. Murphy, Ph. D., D. Graves, Ph. D., and T. L. Kuhls, M. D., "Lymphocyte proliferative responses to opportunistic agents in healthy individuals", Presbyterian Health Foundation Grant, 1992 -1994.

8. Principal investigator, "Host defense systems in *Candida albicans* infections", Presbyterian Health Foundation, 1991 - 1992.

9. Principal investigator, "Pathogenetic mechanisms in gastrointestinal candidiasis", Veterans Administration Merit Review Proposal, 1988 - 1991.

10. Coprincipal investigator with T. L. Kuhls, M. D., "Cryptosporidial infection of SCID and BALB/c mice: A model of cryptosporidiosis in the AIDS patient", 1988 College of Medicine Biomedical Research Support Grant, 1988 - 1989.

11. Principal investigator, "*Candida* colonization of the gastrointestinal tract", the OUHSC/ Presbyterian Foundation Seed Grant Award Program, 1987 - 1988.

12. Principal investigator, "*Candida* infections in compromised hosts", Veterans Administration Merit Review Proposal, 1984 - 1987.

13. Cosponsor with P. W. Kincade, Ph. D., "Effects of systemic infection with *Candida albicans* on lymphohemopoietic regulation", Presbyterian Foundation physician - Scientist Program by Siddhartha Mahanty, M. D., 1986.

14. Principal investigator, "Comparative serologic evaluation of animal models of candidiasis", Veterans Administration Research Advisory Group, 1982 - 1984.

Research contracts awarded and completed

1. Subinvestigator with Leonard N. Slater, M.D. (local principal investigator), "A large, simple trial comparing two strategies for management of anti-retroviral therapy (The SMART Study)", Community Programs for Clinical Research in AIDS, National Institute of Allergy and Infectious Diseases, National Institute of Health, 2005 - 2007.

2. Co-investigator with others in Infectious Diseases Section, "Open label compassionate use of nitazoxanide for the treatment of cryptosporidiosis in AIDS patients", Romark Laboratories, 2000 – 2002.

3. Co-investigator with others in Infectious Diseases Section, "Open-label study of thalidomide in the treatment of giant aphthous esophageal ulcers refractory to standard treatment or in treatment-intolerant patients", Celgene Corporation, 1998 - 2002.

4. Coprincipal investigator with G. T. Kinasewitz, M. D., and C. Gentry, Pharm. D., "Multicenter, open-label, randomized study to compare the safety and efficacy of levofloxacin vs. azithromycin in the treatment of moderate to severe community-acquired pneumonia in adults", Ortho-McNeil Pharmaceutical, 1997-1999.

5. Coinvestigator with NIH-NIAID Mycoses Study Group, "Hospital epidemiology and case surveillance for aspergillosis", 1996 - 1998.

6. Coinvestigator, "An open-label study of oral ganciclovir for maintenance treatment of cytomegalovirus retinitis in people with limited venous access", Syntex, Inc., 1994 - 1997.

7. Coinvestigator with others in NIH-NIAID Mycoses Study Group, "Open comparative multicenter study of two doses of fluconazole in patients with non-acute histoplasmosis and blastomycosis and with sporotrichosis", Pfizer, Inc., 1990 - 1995.

8. Collaborating investigator with M. M. Huycke, M. D., (principal investigator), the VA HIV Research Consortium, "A prospective randomized trial of two treatment regimens for AIDS patients with disseminated *Mycobacterium avium* complex infection".

9. Coinvestigator with M. M. Huycke, M. D., (principal investigator) and the others in the Infectious Diseases Section, "An open study of foscarnet treatment of acyclovir-resistant mucocutaneous herpes simplex virus infection in patients with immunodeficiencies".

10. Coprincipal investigator with T. L. Kuhls, M. D., and D. A. Mosier, D. V. M., Ph. D., "*In vitro* and *in vivo* activity of bismuth subsalicylate and other bismuth salts against *Cryptosporidium parvum*", Procter and Gamble, Inc., 1993 - 1995.

11. Coprincipal investigator with Candidemia Study Group, "An open, comparative multicentered study of fluconazole versus amphotericin B in the treatment of candidemia in non-neutropenic patients", Pfizer, Inc., 1990 - 1994.

12. Coprincipal investigator with T. L. Kuhls, M. D., and D. A Mosier, D. V. M., Ph. D., "A trial of azithromycin therapy as treatment of cryptosporidiosis in mice with severe combined immuno-deficiency", Pfizer Central Research, 1992 - 1993.

13. Coinvestigator with the Azithromycin for Chlamydial Infections Study Group, "Azithromycin in the treatment of sexually transmitted diseases", Pfizer, Inc., 1989 - 1990.

14. Coprincipal investigator with Fungal Prophylaxis Study Group, "Fluconazole in the prevention of fungal infections in neutropenic patients undergoing bone marrow transplantation", McGraw - Hill Clinical Research for Pfizer, Inc., 1989 - 1990.

15. Coprincipal investigator with Acute Leukemia Study Group, "Fluconazole in the prevention of fungal infections in neutropenic patients undergoing chemotherapy for acute leukemia", McGraw - Hill Clinical Research for Pfizer, Inc., 1989 - 1990.

16. Coinvestigator, "Non-comparative study of fluconazole in patients with serious mycoses and who cannot be treated with conventional antifungal therapy", Pfizer, Inc., 1986 - 1989.

IX. Current Committee Positions

College of Medicine Committee

Faculty Appeals Board

Hospital Committees

OU Medical Center Pharmacy and Therapeutics Committee, 1983 – present

Chair, 1991 - present

Executive Subcommittee, Chair, 1991 - present

Formulary Subcommittee, Chair, 2000 – present

OU Medical Patient Care Committee, 1991 - present

OU Medical Center Senior Operations Committee, 2004 – present

X. Service to professional societies

Founding Member, Steering Committee, Ryan White Medical Providers Coalition, HIV Medicine Association, Infectious Diseases Society of America, 2006 – 2010.

Treasurer, VA Society of Practitioners in Infectious Diseases, 2005 – 2008.

American Federation for Clinical Research, University of Oklahoma Faculty Representative, 1985 – 1996.

XI. Peer review activities

Consultant to Veterans Administration Merit Review Board in Infectious Diseases, 1987 – 2006.

Ad hoc reviewer:
American Journal for Medical Sciences
Annals of Tropical Medicine and Parasitology
Canadian Journal of Microbiology
Clinical Infectious Diseases
Expert Opinion on Emerging Drugs
Future Drugs Ltd.
Journal of Critical Illness
Journal of Immunology
Journal of Infectious Diseases
Journal of Medical and Veterinary Mycology
Journal of Parasitology
Life Sciences
Mycoses
Otolaryngology - Head and Neck Surgery
Southern Medical Journal

XII. Publications

Edited book

Bronze M S and Greenfield R A. *Biodefense: Principles and Pathogens*. Horizon Bioscience, Norwich UK, 2005, 838 pages.

Booklets

(this is a republication of the symposium as it appeared in the Journal of the Oklahoma State Medical Association, 1992 - 1993):

1. Greenfield R A. Antimicrobial Therapy I: Principles of Antimicrobial Therapy, Introduction to β-Lactam Antibiotics, the Penicillins. Clinical Concepts, volume 6, number 3, Southern Medical Association, 1993.
2. Greenfield R A. Antimicrobial Therapy II: The Cephalosporins, The Carbapenems and Monobactams. Clinical Concepts, volume 6, number 4, Southern Medical Association, 1993.
3. Greenfield R A. Antimicrobial Therapy III: The Aminoglycosides, the Fluoroquinolones, Trimethoprim-Sulfamethoxazole and the Tetracyclines. Clinical Concepts, volume 6, number 5, Southern Medical Association, 1993.
4. Greenfield R A. Antimicrobial Therapy IV: The Glycopeptide and Macrolide Antibiotics, Chloramphenicol, Clindamycin, and Metronidazole. Clinical Concepts, volume 6, number 6, Southern Medical Association, 1993.

Book chapters

1. Lutz B D and Greenfield R A. Rocky Mountain Spotted Fever. In F J Domino, ed.: *5-Minute Clinical Consult, 2012*, Lippincott Williams & Wilkins, Philadelphia, PA, 1152 – 1153, 2011.

Lutz B D and Greenfield R A. Rocky Mountain Spotted Fever. In F J Domino, ed.: *5-Minute Clinical Consult, 2011*, Lippincott Williams & Wilkins, Philadelphia, PA, 1154 – 1155, 2010.

Chapter of same title and authorship appeared in annual editions 2003 - 2010.

Greenfield R A. Rocky Mountain Spotted Fever. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 2002*, Lippincott Williams & Wilkins, Philadelphia, PA, 2002, pp 964 - 965.

Fine D P and Greenfield R A. Rocky Mountain Spotted Fever. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 2001,* Lippincott Williams & Wilkins, Philadelphia, PA, 2001, pp. 960 - 961.

Chapter of same title and authorship appeared in annual editions 1993 - 2000.

2. Lutz B D and Greenfield R A. Candidiasis. In F J Domino, ed.: *5-Minute Clinical Consult, 2012*, Williams & Wilkins, Philadelphia, PA, 208 – 209, 2011.

Lutz B D and Greenfield R A. Candidiasis. In F J Domino, ed.: *5-Minute Clinical Consult, 2011*, Williams & Wilkins, Philadelphia, PA, 210 – 211, 2010.

Chapter of same title and authorship appeared in annual editions 2003 - 2009.

Greenfield R A. Candidiasis. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 2002*, Lippincott Williams & Wilkins, Philadelphia, PA, 2002, pp. 172 - 173.

Chapter of same title and authorship appeared in annual editions 1993 - 2001.

3. Rathbun R C, Liedtke M D, Lockhart S M, and Greenfield R A. HIV Infection, Antiretroviral Therapy. eMedicine Journal, HIV [serial online], 2009.

4. Sud B and Greenfield R A. Pneumonia, bacterial. In F J Domino, ed.: *5-Minute Clinical Consult, 2009*, 994 - 995.

Chapter of same title and authorship appeared in annual edition 2007 – 2008.

Radike J K and Greenfield R A. Pneumonia, bacterial. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 2006*, Lippincott Williams & Wilkins, Philadelphia, PA, 2006, pp. 856 - 857.

Chapter of same title and authorship appeared in annual editions 1997 - 2005.

5. Machado L J and Greenfield R A. Sporotrichosis. In F J Domino, ed.: *5-Minute Clinical*

Consult, 2009, 1198 - 1199.
Chapter of same title and authorship appeared in 2002 - 2008 annual editions.
Scott E N, Greenfield R A, and Fine D P. Sporotrichosis. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 2001,* Lippincott Williams & Wilkins, Philadelphia, PA, 2001, pp. 1014 - 1015.
Chapter of same title and authorship appeared in annual editions 1994 - 2000.

6. Lutz B D and Greenfield R A. Nocardiosis. In F J Domino, ed.: *5-Minute Clinical Consult, 2009*, 876 - 877.
Chapter of same title and authorship appeared in annual editions 2003 - 2008.
Greenfield R A. Nocardiosis. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult*, Lippincott Williams & Wilkins, Philadelphia, PA, 2002, pp. 738 - 739.
Greenfield R A and Fine D P. Nocardiosis. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 2001*, Lippincott Williams & Wilkins, Philadelphia, PA, 2001, pp. 734 - 735.
Chapter of same title and authorship appeared in annual editions 1993 - 2000.

7. Greenfield R A. Sporotrichosis. eMedicine Journal: Medicine, Surgery, and Psychiatry. [serial online], 2001, 2005, 2006, 2007, 2008.

8. Greenfield R A. Nocardiosis. eMedicine Journal: Medicine, Surgery, and Psychiatry. [serial online], 2001, 2005, 2006, 2007, 2008.

9. Greenfield R A. Sporotrichosis. In D. Schlossberg, ed: *Clinical Infectious Disease*, Mosby, Cambridge University Press, New York, 2008, pp. 1201 - 1204.
Greenfield R A and Scott E N. Sporotrichosis. In D. Schlossberg, ed: *Current Therapy of Infectious Disease*, Mosby, St. Louis, MO, 2001, pp.706 - 708.

10. Bronze M S and Greenfield R A. Introduction. In M S Bronze and R A Greenfield, ed.: *Biodefense: Principles and Pathogens*, Horizon Bioscience, Norwich, UK, 2005, pp. 1 – 23.

11. Greenfield R A, Carabin H, Drevets D A, and Gilmore M S. Anthrax. In M S Bronze and R A Greenfield, ed.: *Biodefense: Principles and Pathogens*, Horizon Bioscience, Norwich, UK, 2005, pp. 165 – 216.

12. Greenfield R A, Slater L N, and Bronze M S. Botulism. In M S Bronze and R A Greenfield, ed.: *Biodefense: Principles and Pathogens*, Horizon Bioscience, Norwich, UK, 2005, 217 – 247.

13. Voskuhl G W, Greenfield R A, and Bronze M S. Diseases due to other Category B bacterial pathogens I: brucellosis, glanders, and melioidosis. In M S Bronze and R A Greenfield, ed.: *Biodefense: Principles and Pathogens*, Horizon Bioscience, Norwich, UK, 2005, 455 – 492.

14. Boatright D T and Greenfield R A. Bioterrorism and threats to water safety: cholera and cryptosporidiosis. In M S Bronze and R A Greenfield, ed.: *Biodefense: Principles and Pathogens*, Horizon Scientific Press, Norwich, UK, 2005, 587 - 617.

15. Carabin H, Perez D, Gilpen Jr. J L, and Greenfield R A. Animal diseases as a possible consequence of biological attack. In M S Bronze and R A Greenfield, ed.: *Biodefense: Principles and Pathogens*, Horizon Bioscience, Norwich, UK, 2005, 737 - 791.

16. Bronze M S and Greenfield R A. Nipah virus. In J Fuchs and M. Podda, ed.: *Encyclopedia of Medical Genomics and Proteomics*, Marcel Dekker, New York, NY, 2004, pp. 925 - 928.

17. Greenfield R A. *Sporothrix schenckii.* In S L Gorbach, J G Bartlett, and N R Blacklow. Infectious Diseases (3rd edition). Lippincott, Williams, and Wilkins. Philadelphia, 2004, pp. 2246 – 2249.
Scott E N and Greenfield R A. *Sporothrix schenckii.* In S L Gorbach, J G Bartlett, and N R Blacklow, ed: *Infectious Diseases* (second edition), Saunders, Philadelphia, PA, 1998, pp. 2361 - 2365.

18. Voskuhl G W and Greenfield R A. Pneumonia, viral. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 2003*, Lippincott Williams & Wilkins, Philadelphia, PA, 2003, pp. 848 - 849.
Chapter of same title and authorship appeared in annual editions 1998 - 2002.
Rotz L D and Greenfield R A. Pneumonia, viral. In M R Dambro, ed.: *Griffith's: 5-Minute Clinical Consult, 1997*, Williams and Wilkins, Media, Pa, 1997, pp. 820 - 821.

19. Greenfield R A, Fine D P, and Postier R G. Infections. In Coussons R T, McKee P A, and Williams G R, ed.: *Manual of Medical Care of the Surgical Patient*, fourth edition. Little, Brown, and Company, Boston, MA, 1990. pp. 153 - 160.

20. Whitsett T, Fine D, Greenfield R, and Kuebler P. Drugs. In Coussons R T, McKee P A, and Williams G R, ed.: *Manual of Medical Care of the Surgical Patient*, fourth edition. Little, Brown, and Company, Boston, MA, 1990. pp. 257 - 294.

21. Kirk J L Jr., Greenfield R A, Slease R B, and Epstein R B. Infectious complications of autologous bone marrow transplantation. In Dicke K A, Spitzer G, Jagannath S, Favrot M, and Peters W, ed.: *Autologous Bone Marrow Transplantation, Proceedings of the Third International Symposium.* The University of Texas M. D. Anderson Hospital and Tumor Institute at Houston, Houston, TX. 1987. pp. 639 - 645.

22. Fine D P and Greenfield R A. Antimicrobial selection in the intensive care unit. In McCafree D R, ed.: *Intensive Care in Internal Medicine.* Karger, Basel, Switzerland. 1985. Prog Crit Care Med 2: 280 - 290.

23. Greenfield R A and Craig W A. Pharmacokinetics of cefoperazone: a review. In: *Sixth International Cefoperazone Symposium,* Excerpta Medica, Princeton, NJ, 1983. pp. 74 - 90.

Articles: Reports of original investigations (scholarship of discovery)

1. Thompson J N, Huycke M M, Greenfield R A, Kurdgelashvili G, and Gentry C A. Case – control study of statin prevention of mould infections. Mycoses, 2011, epub ahead of print.

2. Jackson L A, Drevets D A, Dong Z-M, Greenfield R A, and Murphy J A. Levels of L-selectin (CD62L) on human leukocytes in disseminated cryptococcosis with and without an associated HIV-1 infection. J Infect Dis 191: 1361 – 1367, 2005.

3. Gentry C A, Greenfield R A, Huycke M, Slater L N, and Wack, M. Cost-effectiveness of a comprehensive, educational-based antimicrobial control program in a teaching hospital. Am J Health-Syst Pharm 57: 268 – 274, 2000.

4. Brannan D K, Greenfield R A, Owen W L, Welch D F, and Kuhls T L. Protozoal colonization of the intestinal tract in institutionalized Romanian children. Clin Infect Dis 22: 456 - 461, 1996.

5. Kuhls T L, Mosier D A, Crawford D L, Abrams V L, and Greenfield R A. Improved survival of severe combined immunodeficiency (scid) mice with cryptosporidiosis by adoptively transferring CD4+ and CD4- CD8- B220- BALB/c splenocytes. J Eukaryot Microbiol 43: 71S, 1996.

6. Greenfield R A, Mosier D A, Crawford D L, Abrams V L, Kuhls D L. Bismuth subsalicylate prophylaxis of *Cryptosporidium parvum* infection in immunodeficient mice. J Eukaryot Microbiol 43: 69S, 1996.

7. Steele M I, Kuhls T L, Nida K, Meka C S R, Halabi I M, Mosier D A, Elliott W, Crawford D L, and Greenfield R A. A *Cryptosporidium parvum* genomic region encoding hemolytic activity.

Infect Immun 63: 3840 - 3845, 1995.

8. Kuhls T L, Orlicek S L, Mosier D A, Crawford D L, Abrams V L, and Greenfield R A. Enteral human serum immunoglobulin treatment of cryptosporidiosis in mice with severe combined immunodeficiency. Infect Immun 63: 3582 - 3586, 1995.

9. Kuhls T L, Mosier D A, Abrams V L, Crawford D L, and Greenfield R A. Inability of interferon-gamma and aminoguanidine to alter *Cryptosporidium parvum* infection in mice with severe combined immunodeficiency. J Parasitol 80: 480 - 485, 1994.

10. Rohlman V C, Kuhls T L, Mosier D A, Crawford D L, Hawkins D R, Abrams V L, and Greenfield R A. Therapy with atovaquone for *Cryptosporidium parvum* infection in neonatal severe combined immunodeficiency mice. J Infect Dis 168: 258 - 260, 1993.

11. Greenfield R A, Abrams V L, Crawford D L, and Kuhls T L. Effect of abrogation of natural killer cell activity on the course of candidiasis induced by intraperitoneal administration and gastrointestinal candidiasis in mice with severe combined immunodeficiency. Infect Immun 61: 2520 - 2526, 1993.

12. Greenfield R A and Joyce W A. Gastric colonization with *Candida albicans*. Mycopathol 122: 1 - 5, 1993.

13. Greenfield R A. Some aspects of competing analyses of small data sets with missing values. Master's thesis, University of Oklahoma College of Public Health, Oklahoma City, 1993.

14. Rohlman V C, Kuhls T L, Mosier D A, Crawford D L, and Greenfield R A. *Cryptosporidium parvum* infection after abrogation of natural killer cell activity in normal and severe combined immunodeficiency mice. J Parasitol 79: 295 - 297, 1993.

15. Kuhls T L, Greenfield R A, Mosier D A, Crawford D L, and Joyce W A. Cryptosporidiosis in adult and neonatal mice with severe combined immunodeficiency. J Comp Pathol 106: 399 - 410, 1992.

16. Narayanan R, Joyce W A, and Greenfield R A. Gastrointestinal candidiasis in a murine model of severe combined immunodeficiency syndrome. Infect Immun 59: 2116 - 2119, 1991.

17. Mahanty S, Greenfield R A, Joyce W A, and Kincade P W. Inoculation candidiasis in a murine model of severe combined immunodeficiency syndrome. Infect Immun 56: 3162 - 3166, 1988.

18. Greenfield R A, Troutt D L, Rickard R C, and Altmiller D H. Comparison of antibody, antigen, and metabolite assays in rat models of systemic and gastrointestinal candidiasis. J Clin Microbiol 26: 409 - 417, 1988.

19. Kirk J L Jr., Greenfield R A, Slease R B, and Epstein R B. Analysis of early infectious complications after autologous bone marrow transplantation. Cancer 62: 2445 - 2450, 1988.

20. Thompson D F, Harley J B, and Greenfield R A. Experience with a P & T letter to influence cefazolin dosing. Hospital Therapy 22: 309 - 312, 1987.

21. Greenfield R A, Bussey M J, Stephens J L, and Jones J M. Serial enzyme-linked immunosorbent assays for antibody to *Candida* antigens during induction chemotherapy for acute leukemia. J Infect Dis 148: 275 - 283, 1983.

22. Greenfield R A, Stephens J L, Bussey M J, and Jones J M. Quantitation of antibody to *Candida* mannan by enzyme-linked immunosorbent assay. J Lab Clin Med 101: 758 - 771, 1983.

23. Greenfield R A, Gerber A U, and Craig W A. Pharmacokinetics of cefoperazone in patients

with normal and with impaired hepatic and renal function. Rev Infect Dis 5 (Suppl 1): S127 - S136, 1983.

24. Greenfield R A, Kurzynski T M, and Craig W A. Susceptibility of *Clostridium difficile* to cefotaxime, moxalactam, and cefoperazone. Antimicrob Agents Chemother 21: 846 - 847, 1982.

25. Greenfield R A and Jones J M. Comparison of cytoplasmic extracts of eight *Candida* species and *Saccharomyces cerevisiae*. Infect Immun 35: 1157 - 1161, 1982.

26. Greenfield R A and Jones J M. Purification and characterization of a major cytoplasmic antigen of *Candida albicans*. Infect Immun 34: 469 - 477, 1981.

27. Kirvel R D, Greenfield R A, and Meyer D R. Multimodal sensory neglect in rats with radical unilateral posterior isocortical and superior collicular ablations. J Comp Physiol Psych 87: 156 - 162, 1974.

Articles: Reports of clinical trials (scholarship of discovery)

1. Donta S T, Engel Jr. C C, Collins J F, Baseman J B, Dever L L, Taylor T, Boardman K D, Kazis L E, Martin S E, Wiseman A L, Kernodle D, Feussner J R, Smith R P, Baltch A L, Handanos C, Baron S, Catto B, Everson M, Blackburn W, Thakore M, Brown S T, Lutwick L, Norwood D, Bernstein J, Bacheller C, Canty J, Church L W P, Ribner B, Wilson K H, Guduru P, Cooper R, Lentino J, Hamill R J, Gorin A B, Gordon V, Wagner D, Robinson C, DeJace P, Greenfield R, Beck L, Bittner M, Schumacher H R, Silverblatt F, Schmitt J, Wong E, Ryan M A K, Figueroa J, Chung R, Nice C, for the VA Cooperative #475 Group. Benefits and harms of doxycycline treatment for Gulf War Veterans' Illnesses. A randomized, double-blind, placebo-controlled trial. Ann Intern Med 141: 85 – 94, 2004.

2. Kauffman C A, Pappas P G, McKinsey D S, Greenfield R A, Perfect J R, Cloud G A, Thomas C J, Dismukes W E, and the National Institute of Allergy and Infectious Diseases Mycoses Study Group. Treatment of lymphocutaneous and visceral sporotrichosis with fluconazole. Clin Infect Dis 22: 46 - 50, 1996.

3. Goodman J L, Winston D J, Greenfield R A, Chandrasekar P H, Fox B, Kaizer H, Shadduck R K, Shea T C, Stiff P, Friedman D J, Powderly W G, Silber J L, Horowitz H, Lichtin A, Wolff S N, Mangan K F, Silver S M, Weisdorf D, Ho W G, Gilbert G, and Buell D. A controlled trial of fluconazole to prevent fungal infections in patients undergoing bone marrow transplantation. N Engl J Med 326: 845 - 851, 1992.
Authors' reply to letters to the editor (Goodman J L, Greenfield R A, and Buell, D), N Engl J Med 327: 645, 1992.

Articles: Reviews (scholarship of dissemination)

1. Salinas L J, Greenfield R A, Little S E, and Voskuhl G W. Tickborne infections in the Southern United States. Am J Med Sci 340:194 – 201, 2010.

2. Greenfield R A and Bronze M S. Emerging pathogens and knowledge in infectious diseases: Symposium introduction. Am J Med Sci 340:177 – 180, 2010.

3. Blevins S, Greenfield R A, Bronze M S. Blood smear analysis in babesiosis, ehrlichiosis, relapsing fever, malaria, and Chagas disease. Cleve Clin Med 75: 521 – 530, 2008.

4. Ali T, Greenfield R A, Scofield H, Bronze MS. Gatifloxacin – associated hypoglycemia. J Okla State Med Assoc 100: 425 – 428, 2007.

5. Stephens J R, Rathbun R C, Lockhart S M, Bronze M S, and Greenfield R A. Symposium on antimicrobial therapy. XV. Antiretroviral therapy for human immunodeficiency virus infections. J Okla State Med Assoc 100: 417 – 424, 2007.

6. Lockhart S M, Salvaggio, M R, Bronze M S, and Greenfield R A. Symposium on antimicrobial therapy. XIV. Antiviral agents other than antiretrovirals: therapy for herpesvirus infections, viral hepatitis, and influenza. J Okla State Med Assoc 100: 388 – 397, 2007.

7. Busse K, Gentry C, Bronze M S, and Greenfield R A. Symposium on antimicrobial therapy. XIII. Antifungal therapy. J Okla State Med Assoc, 100: 344 – 350, 2007.

8. Busse K, Gentry C, Bronze M S, and Greenfield R A. Symposium on antimicrobial therapy. XII. Antituberculosis therapy. J Okla State Med Assoc 100: 296 – 301, 2007.

9. Sud B, Salvaggio M, Greenfield R A, and Bronze, M S. Symposium on antimicrobial therapy. XI. Trimethoprim-sulfamethoxazole, nitrofurantoin, chloramphenicol, metronidazole and tinidazole, rifaximin, and nitazoxanide. J Okla State Med Assoc, 100: 267 – 272, 2007.

10. Vincent S, Bronze M S, Cooper T W, and Greenfield R A. Symposium on antimicrobial therapy. X. Tetracycline and glycylcycline antimicrobials. J Okla State Med Assoc, 100: 241 – 247, 2007.

11. Vincent S, Machado L J, Cooper T W, Bronze M S, and Greenfield R A. Symposium on antimicrobial therapy. IX. Quinolone antimicrobials. J Okla State Med Assoc, 100: 149 – 156, 2007.

12. Hoffman-Roberts H L, Obritsch M D, Bronze M S, and Greenfield R A. Symposium on antimicrobial therapy. VIII. Glycopeptides, oxazolidinones, and lipopeptides. J Okla State Med Assoc, 100: 103 – 109, 2007.

13. Dang V, Nanda N, Cooper T W, Greenfield R A, and Bronze M S. Symposium on antimicrobial therapy. VII. Macrolides, azalides, ketolides, lincosamides, and streptogramins. J Okla State Med Assoc, 100: 75 – 81, 2007.

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