COMPREHENSIVE MEDICAL CARE FOR BIOTERRORISM EXPOSURE—ARE WE MAKING EVIDENCED-BASED DECISIONS? WHAT ARE THE RESEARCH NEEDS?

HEARING

BEFORE THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTH CONGRESS

FIRST SESSION

NOVEMBER 14, 2001

Serial No. 107–45

Printed for the use of the Committee on Government Reform

Available via the World Wide Web: http://www.gpo.gov/congress/house
http://www.house.gov/reform

U.S. GOVERNMENT PRINTING OFFICE

77–497 PDF WASHINGTON : 2002

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2250 Mail: Stop SSOP, Washington, DC 20402–0001

COMMITTEE ON GOVERNMENT REFORM

DAN BURTON, Indiana, *Chairman*

BENJAMIN A. GILMAN, New York
CONSTANCE A. MORELLA, Maryland
CHRISTOPHER SHAYS, Connecticut
ILEANA ROS-LEHTINEN, Florida
JOHN M. MCHUGH, New York
STEPHEN HORN, California
JOHN L. MICA, Florida
THOMAS M. DAVIS, Virginia
MARK E. SOUDER, Indiana
STEVEN C. LATOURETTE, Ohio
BOB BARR, Georgia
DAN MILLER, Florida
DOUG OSE, California
RON LEWIS, Kentucky
JO ANN DAVIS, Virginia
TODD RUSSELL PLATTS, Pennsylvania
DAVE WELDON, Florida
CHRIS CANNON, Utah
ADAM H. PUTNAM, Florida
C.L. "BUTCH" OTTER, Idaho
EDWARD L. SCHROCK, Virginia
JOHN J. DUNCAN, Tennessee

HENRY A. WAXMAN, California
TOM LANTOS, California
MAJOR R. OWENS, New York
EDOLPHUS TOWNS, New York
PAUL E. KANJORSKI, Pennsylvania
PATSY T. MINK, Hawaii
CAROLYN B. MALONEY, New York
ELEANOR HOLMES NORTON, Washington, DC
ELIJAH E. CUMMINGS, Maryland
DENNIS J. KUCINICH, Ohio
ROD R. BLAGOJEVICH, Illinois
DANNY K. DAVIS, Illinois
JOHN F. TIERNEY, Massachusetts
JIM TURNER, Texas
THOMAS H. ALLEN, Maine
JANICE D. SCHAKOWSKY, Illinois
WM. LACY CLAY, Missouri
DIANE E. WATSON, California
STEPHEN F. LYNCH, Massachusetts

BERNARD SANDERS, Vermont (Independent)

KEVIN BINGER, *Staff Director*
DANIEL R. MOLL, *Deputy Staff Director*
JAMES C. WILSON, *Chief Counsel*
ROBERT A. BRIGGS, *Chief Clerk*
PHIL SCHILIRO, *Minority Staff Director*

CONTENTS

	Page
Hearing held on November 14, 2001	1
Statement of:	
Jonas, Wayne B., M.D., director, Samueli Institute for Information Biology, Alexandria, VA, and associate professor, department of family medicine, Uniformed Services University of the Health Sciences, F. Edward Hebert School of Medicine; H. Reg McDaniel, M.D., director of research, Fisher Institute of Medical Research, medical director, Mannatech, Inc., Grand Prairie, TX; Sherwood Gorbach, M.D., Tufts University, Boston, MA; and Richard S. Klasco, M.D., medical director, Micromedex, Inc., Greenwood Village, CO	72
Parker, Major General John S., U.S. Army Medical Research Institute for Infectious Diseases, Department of Defense; Stephen Straus, M.D., Director, National Center for Complementary and Alternative Medicine; Carole Heilman, Ph.D., Director, Division of Microbiology and Infectious Diseases, National Institute of Allergy and Infectious Diseases; Andrea Meyerhoff, M.D., Director of Anti-Terrorism Programs, Center for Biologics Research and Review, Food and Drug Administration; and William Egan, Ph.D., Director, Office of Vaccine Research and Review, Food and Drug Administration	12
Letters, statements, etc., submitted for the record by:	
Burton, Hon. Dan, a Representative in Congress from the State of Indiana, prepared statement of	5
Clay, Hon. Wm. Lacy, a Representative in Congress from the State of Missouri, prepared statement of	112
Gorbach, Sherwood, M.D., Tufts University, Boston, MA, prepared statement of	92
Heilman, Carole, Ph.D., Director, Division of Microbiology and Infectious Diseases, National Institute of Allergy and Infectious Diseases, prepared statement of	45
Jonas, Wayne B., M.D., director, Samueli Institute for Information Biology, Alexandria, VA, and associate professor, department of family medicine, Uniformed Services University of the Health Sciences, F. Edward Hebert School of Medicine, prepared statement of	75
Klasco, Richard S., M.D., medical director, Micromedex, Inc., Greenwood Village, CO, prepared statement of	97
McDaniel, H. Reg, M.D., director of research, Fisher Institute of Medical Research, medical director, Mannatech, Inc., Grand Prairie, TX, prepared statement of	81
Morella, Hon. Constance A., a Representative in Congress from the State of Maryland, prepared statement of	61
Parker, Major General John S., U.S. Army Medical Research Institute for Infectious Diseases, Department of Defense, prepared statement of	16
Straus, Stephen, M.D., Director, National Center for Complementary and Alternative Medicine, prepared statement of	35

COMPREHENSIVE MEDICAL CARE FOR BIOTERRORISM EXPOSURE—ARE WE MAKING EVIDENCED-BASED DECISIONS? WHAT ARE THE RESEARCH NEEDS?

WEDNESDAY, NOVEMBER 14, 2001

HOUSE OF REPRESENTATIVES,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The committee met, pursuant to notice, at 1:10 p.m., in room 2154, Rayburn House Office Building, Hon. Dan Burton (chairman of the committee) presiding.

Present: Representatives Burton, Gilman, Morella, Shays, Lewis, Otter, LaTourette, Waxman, Owens, Sanders, Norton, Cummings, Kucinich, Clay, Watson, and Lynch.

Staff present: Kevin Binger, staff director; David A. Kass, deputy chief counsel; Mark Corallo, director of communications; S. Elizabeth Clay and John Rowe, professional staff members; Robert A. Briggs, chief clerk; Michael Bloomrose and Michael Layman, staff assistants; Robin Butler, office manager; Elizabeth Crane, legislative assistant; Joshua Gillespie, deputy chief clerk; Leneal Scott, computer systems manager; Corinne Zaccagnini, systems administrator; Sarah Despres, minority counsel; Ellen Rayner, minority chief clerk; and Jean Gosa and Earley Green, minority assistant clerks.

Mr. BURTON. Good afternoon. The quorum being present, the Committee on Government Reform will come to order. I ask unanimous consent that all Members' and witnesses' written and opening statements be included in the record. And without objection, so ordered. I ask unanimous consent that all articles, exhibits and extraneous or tabular material being referred to be included in the record. Without objection, so ordered.

We are here today to look at comprehensive medical care for bioterrorism exposure. There are several treatments suggested to protect individuals who have been exposed to biological agents such as anthrax and smallpox. We have vaccines. We have antibiotics and other drugs. We also have complementary and alternative treatments and nutritional approaches that can supplement conventional treatments. This area has not been discussed very much.

The medical community is now expected to be on the lookout for anthrax, smallpox and other possible biological terrorism agents. The public is looking for answers on what they can do to protect themselves. People want more information than they are getting.

Many are turning to the Internet for answers about what to do to protect themselves and their families.

There is a lot of very good information on the Internet. There's also some very bad information on the Internet. It's hard for the layman to tell the good from the bad. And that's why it's so important for people to get advice from their doctors and other qualified health experts. Some unscrupulous people have been advertising alternative products on the Internet as a cure for anthrax. We have found no evidence to support any of these claims. The leading dietary supplement association has issued a statement to make it very clear that there is no dietary supplement known to cure anthrax and it is illegal to make such a claim. I applaud them for doing that. The vast majority of the supplement manufacturers have always behaved very responsibly and this is another example of that.

We want to clear up some of these issues today. We will be looking at how much we know about the safety and efficacy of all treatments of potential use in a bioterrorist attack.

At the same time, there are complementary and nutritional approaches that may help minimize some of the side effects of conventional treatments like antibiotics. There are also some nutritional approaches that may improve the outcome of the conventional treatments. There is research evidence in both of these areas.

This fall anthrax spores were mailed to several media outlets and congressional offices. As a result, four people have died and several individuals are ill from either inhalation or cutaneous anthrax. We are fortunate that we have some very good antibiotics available and that doctors were able to save the lives of several anthrax victims. Today as a precautionary measure thousands of individuals are now on antibiotics, and it's very important for those at risk to continue their antibiotics under their doctor's care.

All antibiotics can leave patients vulnerable for other infections, and some antibiotics have more severe side effects than others. In fact, Cipro has serious side effects associated with it. According to the information provided on the Bayer Web site, that is the producer of the product, expected side effects include nausea, diarrhea, vomiting, abdominal pain, discomfort, headache, rash and restlessness. In rare cases, Cipro may cause more serious side effects than these.

Let me repeat, it's important for patients who have been prescribed this antibiotic to follow their doctor's advice. While these side effects are usually rare, patients need to be fully informed of what they can expect when taking this or other products and what they can do to maximize the benefit while reducing the risks. We will be hearing today from Dr. Reg McDaniel and Dr. Sherwood Gorbach, both experts in the area of nutrition and immunology.

Vaccines are another area where the public needs more information. For instance, the Government Reform Committee has done extensive oversight investigations about the Department of Defense's anthrax vaccine immunization program. And I'd like to thank Congressman Shays, who I think will be with us in a little bit, for his diligence in this area.

We have all heard in the media the DOD talking about giving everyone in the country the anthrax vaccination. People who advo-

cate but don't have all of the facts. In the military, the rate of adverse events from the vaccines has been very high. A few people have been very seriously injured. The company that makes this vaccine has a deplorable track record. There's also many, many questions about the effectiveness of this vaccine. There are many different strains of anthrax, and whether this vaccine would protect people from all of those strains is an open question. So I don't want people to have a false sense of security thinking that the vaccine would protect every one of them against these various strains.

As we learned during vaccine investigations, there's not always a lot of definitive science in vaccine development. Even the Institute of Medicine agrees on this point. Every time the Institute of Medicine has reviewed the body of research evidence on specific vaccines, their experts have pointed out significant shortcomings in the evidence.

Some of the information on the Internet recommends using homeopathic remedies to protect against biological terrorism. We will hear today from Dr. Wayne Jonas about the research he conducted at Walter Reed Army Research Center on homeopathic solutions and biological agents. He has published several studies in this area. Because of his expertise in complementary and alternative medicine and research methodology, Dr. Jonas was loaned by the Army to the National Institutes of Health for 3 years to serve as the Director of the Office of Alternative Medicine. While he is retired from the Army, Dr. Jonas is continuing his research as the Director of the Samueli Institute for Information Biology. Dr. Jonas is also a member of the White House Commission on Complementary and Alternative Medicine Policy.

We have a lot of questions that need to be answered today. No. 1, what is the evidence base for safety and efficacy for various preventative and post-exposure treatment options? What is the evidence base about nutritional support for the immune system and for patients on antibiotics? What is the role of homeopathy, essential oils, dietary supplements and other complementary and other alternative therapies in biological terrorist prevention and recovery? Has our government embraced existing science and historical case studies and looked to maximize low cost, low harm immune supportive theories? Has our government looked at other systems of medicine for promising therapies? And where does the public go to find reliable information on these therapies?

Three themes are crucial as we move forward from September 11. First, we must think outside the box. Second, we must work together. And third, information is power.

First, let's think outside the box. Solutions to protecting the public from biological warfare cannot be found in any existing "how to" manual. We are not going to be able to develop vaccines to protect the public against every possible biological threat. We need to know how to take care of those who have not been vaccinated.

Second, we must put aside our differences and work together. We as a nation, as a world, must set aside our political differences. We must set aside biases against those whose ideas are different from our own and work together to find safe, effective and available solutions to the challenges we face as a result of the evils of terrorism.

And the government and the research community must move away from attacking those who would use nutritional approaches and complementary therapies in healing and keep an open mind about theories that we may be unfamiliar with. We must work together to determine the existing level of evidence on both safety and efficacy on all therapies and then move quickly to fill in the research gaps.

And third, information is power. It is important to put good information in the hands of the medical community and the public. How can we get answers quickly and with some measure of confidence?

Dr. Richard Klasco is here today to talk about one possible solution. As an emergency room physician, Dr. Klasco knows how crucial it is to have accurate information at your fingertips in unusual circumstances. Micromedex is a company that markets the electronic Physician's Desk Reference [PDR], and numerous drug, toxicology and alternative medicine data bases. They have recently developed a data base on bioterrorism. BioDex provides the full array of information needed by first responders and medical personnel for biological terrorism agents. The data base will be Web accessible. It can be purchased on CD or loaded into hand-held "palm" computers as well.

From the government, we are going to receive testimony from Major General Parker on behalf of the Department of Defense; also Dr. Straus, the Director of the National Center on Complementary and Alternative Medicine; and Carole Heilman from the National Institute of Allergy and Infectious Diseases will be testifying. We also have Dr. Andrea Meyerhoff and Dr. William Egan from the FDA to answer questions.

I look forward to hearing from all of our witnesses today, and the record will remain open until November 28.

And with that Mr. Waxman, I will recognize you.

[The prepared statement of Hon. Dan Burton follows:]

Opening Statement
Chairman Dan Burton
Government Reform Committee
Hearing

"Comprehensive Medical Care for Bioterrorism Exposure – Are We Making Evidence-Based Decisions? What are the Research Needs?"

November 14, 2001
1:00 pm
2154 Rayburn House Office Building
Washington, D.C.

Good afternoon. We are here today to look at Comprehensive medical care for bioterrorism exposure. There are several treatments suggested to protect individuals who may have been exposed to biological agents such as anthrax and smallpox. We have vaccines. We have antibiotics and other drugs. We also have complementary and alternative treatments and nutritional approaches that can supplement conventional treatments. This area hasn't been discussed much.

The medical community is now expected to be on the lookout for anthrax, smallpox and other possible biological terrorism agents. The public is looking for answers on what they can do to protect themselves. People want more information than they're getting. Many are turning to the Internet for answers about what to do to protect themselves and their families.

There is a lot of very good information on the Internet. There is also some very bad information out there. It's hard for the layman to tell the good from the bad. That is why it's so important for people to get advice from their doctors and other qualified health experts. Some unscrupulous people have been advertising alternative products on the Internet as a cure for anthrax. We have found no evidence to support any of these claims. The leading dietary supplement associations have issued a statement to make it very clear that there is no dietary supplement known to cure anthrax and that it is illegal to make such a claim. I applaud them for doing that. The vast majority of the supplement manufacturers have always behaved very responsibly and this is another example of that.

We want to clear up some of these issues today. We will be looking at how much we know about the safety and efficacy of all treatments of potential use in a bioterrorist attack.

At the same time, there are complementary and nutritional approaches that may help minimize some of the side effects of conventional treatments like antibiotics. There are also some nutritional approaches that may improve the outcome of the conventional treatments. There is research evidence in both of these areas.

This fall anthrax spores were mailed to several media outlets and Congressional offices. As a result, four people have died and several individuals are ill from either inhalation or cutaneous anthrax. We are fortunate that we have some very good antibiotics available and that doctors were able to save the lives of several anthrax victims. Today, as a precautionary measure, thousands of individuals are now on antibiotics. It is very important for those at risk to continue their antibiotics under their doctor's care.

All antibiotics can leave patients vulnerable for other infections. And some antibiotics have more severe side effects than others. In fact, Ciprofloxacin [Cipro] has serious side affects associated with it. According the information provided on the Bayer website, expected side effects include nausea, diarrhea, vomiting, abdominal pain/discomfort, headache, rash and restlessness. In rare cases, Cipro may cause more serious side effects.

Let me repeat, it is important for patients who have been prescribed this antibiotic to follow their doctor's advice. While these side effects are usually rare, patients need to be fully informed of what they can expect when taking this or other products and what they can do to maximize the benefit while reducing the risks. We will be hearing today from Dr. Reg McDaniel and Dr. Sherwood Gorbach, both experts in the area of nutrition and immunology.

Vaccines are another area where the public needs more information. For instance, the Government Reform Committee has done extensive oversight investigations of the Department of Defenses' Anthrax Vaccine Immunization Program. I would like to thank Congressman Shays for his diligence in this area.

We've all heard people in the media talking about giving everyone in the country the anthrax vaccine. People who advocate that don't have all the facts. In the military, the rate of adverse events from the vaccines has been very high. A few people have been very seriously injured. The company that makes this vaccine has a deplorable track. Record. There are also many many questions about the effectiveness at this vaccine. There are many different strains of anthrax, and whether this vaccine would protect people from all of those strains is an open

question. So I don't want people to a false sense of security, thinking the vaccine will protect them.

As we learned during our vaccine investigation, there is not always a lot of definitive science in vaccine development. Even the Institute of Medicine (IOM) agrees with us on this point. Every time the IOM has reviewed the body of research evidence on specific vaccines, their experts have pointed out significant shortcomings in the evidence.

Some of the information on the Internet recommends using homeopathic remedies to protect against biological terrorism. We will hear today from Dr. Wayne Jonas about the research he conducted at Walter Reed Army Research Center on homeopathic solutions and biological agents. He has published several studies in this area. Because of his expertise in complementary and alternative medicine and research methodology, Dr. Jonas was loaned by the Army to the National Institutes of Health for three years to serve as the Director of the Office of Alternative Medicine (OAM). While he has retired from the army, Dr. Jonas is continuing his research as the Director of the Samueli Institute for Information Biology. Dr. Jonas is also a member of the White House Commission on Complementary and Alternative Medicine Policy.

We have a lot of questions that need to be answered:

- What is the evidence base for safety and efficacy for various preventive and post-exposure treatment options?
- What is the evidence base about nutritional support for the immune system and for patients on antibiotics?
- What is the role of homeopathy, essential oils, dietary supplements and other complementary and alternative therapies in biological terrorist prevention and recovery?
- Has our Government embraced the existing science and historical case studies and looked to maximize low-cost, low-harm, immune supportive therapies?
- Has our Government looked at other systems of medicine for promising therapies?
- Where does the public go to find reliable information on these therapies?

Three themes are crucial as we move forward from September 11:

(1) We must think outside the box.
(2) We must work together, and
(3) Information is power.

First, we must think outside the box. Solutions to protecting the public from biological warfare cannot be found in any existing "How To" manual. We are not going to be able to develop vaccines to protect the public against every possible biological threat. We need to know how to take care of those who have not been vaccinated.

Second, we must put aside our differences and work together. We as a nation -- as a world -- must set aside our political differences, we must set aside biases against those whose ideas are different from our own and work together to find safe, effective, and available solutions to the challenges we face as a result of the evils of terrorism.

The government and the research community must move away from attacking those who would use nutritional approaches and complementary therapies in healing and keep an open mind about theories that we may be unfamiliar with. We must work together to determine the existing level of evidence on both safety and efficacy for all therapies and then move quickly to fill in the research gaps.

Third, information is power. It is important to put good information in the hands of the medical community and the public. How can we get answers quickly and with some measure of confidence?

Dr. Richard Klasco is here today to talk about one possible solution. As an Emergency Room physician, Dr. Klasco knows how crucial it is to have accurate information at your fingertips in unusual circumstances. Micromedex is a company that markets the electronic Physician's Desk Reference (PDR) and numerous drug, toxicology, and alternative medicine databases. They have recently developed a database on bioterrorism. BioDex provides the full array of information needed by first responders and medical personnel for biological terrorism agents. The database will be web-accessible. It can be purchased on CD, or loaded into hand-held "palm" computers.

From the Government, we are going to receive testimony from Major General Parker on behalf on the Department of Defense. Also, Dr. Strauss, the Director of the National Center for Complementary and Alternative Medicine and

Carole Heilman from the National Institute of Allergy and Infectious Diseases will be testifying. We also have Dr. Andrea Myerhoff and Dr. William Egan here from the FDA to answer questions.

I look forward to hearing from all of our witnesses today. The hearing record will remain open until November 28.

Mr. WAXMAN. Thank you very much, Mr. Chairman. Thank you for holding this hearing today. It is critical that we take seriously the threat of biological terrorism. The list of biological agents that could be used as weapons is terrifying.

Smallpox, a disease that was eradicated just over 2 decades ago, is highly contagious and fatal in about 30 percent of the cases. Anthrax, as we have recently seen, can cause fatal illnesses. Other potential biological weapons include botulism toxoid, Q fever, plague and tularemia.

We now know that threats are no longer theoretical. The possibility that there may be more cases of anthrax in the future or that there may be new attacks with different agents must be taken seriously and we must be prepared. These preparations involve making sure we have adequate stockpiles of safe and effective treatments and vaccines as well as systems for distributing the drugs and vaccines. Preparations also involve making sure that State and local health departments are well staffed and fully equipped to handle a chemical or biological weapons attack, and we have to ensure that we have sufficient hospital capacity.

We also need to make sure that people are informed about what to do in case of an attack and where they can go to get reliable information. This includes, for example, an understanding of whether someone needs to take antibiotics or other drugs in the absence of symptoms without confirmed exposure to an agent. People also need to understand what the side effects of these treatments could be.

We do not have treatments or vaccines for every possible biological agent. It is clear that we need to continue to do research in this area to make sure that Americans will be protected against these potential threats. All possible treatments or preventions, including pharmaceuticals, vaccines or dietary supplements, need to meet strict scientific standards for both safety and efficacy. Americans deserve the most effective, safest treatments science can produce.

And I thank the witnesses for appearing today. I look forward to their testimony, and I do want to point out that we will be reviewing all the testimony that is submitted. Unfortunately my schedule is in conflict because I have meetings going on at the same time, so I may not be here to hear your testimony. But rest assured that my staff is here and I will have an opportunity to review what was said as well as the written statements that will be put into the record.

Thank you, Mr. Chairman.

Mr. BURTON. Do other Members have opening statements?

Mr. SANDERS. Thank you, Mr. Chairman. This is an important hearing. It seems to me that on one hand we certainly don't want to frighten the American people, but on the other hand, we would be irresponsible if we did not go through the dreadful exercise of looking at worst case scenarios and seeing how can we best protect the American people in the event of some terrible, terrible outrage against this country.

Some of the concerns that I have, Mr. Chairman, and Mr. Waxman I think touched on it, is if we ran through some worst case scenarios where many millions of people might be made ill on a given day, do we as a nation have the public health infrastructure

to deal with that? Now, can one just imagine the kind of panic and concern that would take place all over this country? People wanting information, people wanting medicine, perhaps vaccines. Where do we get those? Do we as a nation have adequate stockpiles of that?

We have heard, for example—and this is not a criticism because I think, as the chairman indicated, we are into new territory. We've never been there before. We are all trying to learn and do the best thing, and I applaud the efforts of everyone who is trying to do the right thing. But I think even in terms of anthrax, I heard within a period of a couple of days several different analyses and descriptions of what is the proper thing to do. Some people say take Cipro for 60 days. Some people say, well, take Cipro for 5 days and doxycycline for the rest of the period. Some people say, well, take doxyclcyline all throughout.

So I think we have an obligation as a government to make clear to the American people what is the best course of treatment. There were some people that think, oh, I guess Cipro is good for the wealthy people. But if I'm poor, we just get the lower-cost drug. I don't think that's the case, but what is the case? What is the best and effective form of treatment for all people?

Getting back to the issue of public health infrastructure, the truth is that in many ways our country is very advanced medically, but in other ways we are fairly primitive medically. We have 44 million Americans who do not have health insurance. Others are underinsured. Where are they going to get their medicine? Do they have to line up at a local drugstore? I was talking to somebody in Vermont. We are a very rural State. And they said, the drugstores will be open. Sure, we have a town of 1,000 people and some elderly gentleman owns a drugstore. Do you really think that he is going to be able to deal with people besieging the drugstore? Does he have adequate supplies? Should we be dependent on pharmacies to be distributing drugs or do we need a public health approach? Do we have adequate numbers of clinics?

I don't agree with President Bush on many things, but the President has indicated his support for federally qualified health clinics, FQHCs. In fact, these are cost effective ways of providing health care to lower income people all over this country. I think we can agree that in the event of a national emergency, when millions and millions of people need health care, you are not going to ask somebody, well, where is your Blue Cross/Blue Shield card? I'm sorry, we can't treat you.

Every American has got to know that they equally, whether you are rich or poor, will get the same type of treatment. Are we prepared to do that today? Frankly, I don't think we are. So I think we have to look at the health infrastructure, the public health infrastructure, so that we can dispense the kinds of drugs and vaccines that we need, give people the information, give people the treatment. The difficulty here is, and it is a nightmarish issue scenario that we have got to look at, is that on a given day millions and millions and millions of people may need medical treatment. Are we prepared to do that? I suspect we are not.

Mr. Chairman, you and I disagree on many issues but I do applaud you raising the issue of complementary health care and alternative health care. I think there is a lot to be learned from that,

but at the same time I think we have got to make sure that we have available drugs. For example, I think the Secretary had come up with—what was it, Dustin—12 million people in terms of an anthrax attack. Why 12 million and not 30 million? Who made that determination? So I think what's important today is to take a hard look at some very ugly, frightening circumstances and do our best to make sure that the American people are as prepared as they can be, and I thank you for calling this meeting, Mr. Chairman.

Mr. BURTON. Thank you, Mr. Sanders. Further discussion? If not, I would like to invite to the witness table Major General Parker, Dr. Stephen Straus, Dr. Carole Heilman and Dr. Andrea Meyerhoff. Would you please come to the witness table, please. And Dr. Egan, I guess you need to be sworn as well. Would you stand as well?

[Witnesses sworn.]

Mr. BURTON. I think we will go right down the table. Major General Parker, is there an opening statement you would like to make, sir?

STATEMENTS OF MAJOR GENERAL JOHN S. PARKER, U.S. ARMY MEDICAL RESEARCH INSTITUTE FOR INFECTIOUS DISEASES, DEPARTMENT OF DEFENSE; STEPHEN STRAUS, M.D., DIRECTOR, NATIONAL CENTER FOR COMPLEMENTARY AND ALTERNATIVE MEDICINE; CAROLE HEILMAN, PH.D., DIRECTOR, DIVISION OF MICROBIOLOGY AND INFECTIOUS DISEASES, NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES; ANDREA MEYERHOFF, M.D., DIRECTOR OF ANTI-TERRORISM PROGRAMS, CENTER FOR BIOLOGICS RESEARCH AND REVIEW, FOOD AND DRUG ADMINISTRATION; AND WILLIAM EGAN, PH.D., DIRECTOR, OFFICE OF VACCINE RESEARCH AND REVIEW, FOOD AND DRUG ADMINISTRATION

General PARKER. Good afternoon, Mr. Chairman and members of this committee. I am Major General John Parker and today I represent the Department of Defense at this hearing. Sir, we submitted testimony to you for this hearing and I am concerned that it did not address your questions of the committee. I received those questions yesterday morning, and I would appreciate the chairman's indulgence and allow me to resubmit within the next 96 hours testimony that addresses your questions in a very specific manner. Meanwhile, I will address your questions orally from my personal perspective as the Commander of the U.S. Army Medical Research and Materiel Command and Fort Detrick.

The September 11th and the multiple anthrax attacks that occurred since then are only a small indication of the potential destruction and harm that a biological agent can produce. Terrorism, specifically biological terrorism, is an immediate threat to our security both at home and abroad. As our Nation addresses this terrifying threat that has invaded our homeland, the Department of Defense is prepared to assist and to support other Federal and civilian agencies as our capability permits.

We can do this because we have already developed the force health protection program that includes not only acknowledgment of the threat, but also development and implementation of a

planned multi-faceted approach to the medical management of biological warfare casualties.

I would now like to turn to the specific questions that were identified in your invitation to this testimony. The question: Current recommendations for medical care for individuals both at risk for exposure and those suspected or known to have been exposed to the most common biological agents. Several military publications provide information on the medical management of biological warfare casualties. These serve as guidelines and references for health care providers in handling biological warfare casualties.

In addition, the Centers for Disease Control and Prevention issues medical guidance in their weekly publication, Morbidity and Mortality Weekly Report, and in special publications for various events. Pocket-sized handbooks designed to fit in the battle dress uniform pockets are routinely published and provided to military health care personnel as field expedient references in the management of nuclear, biological and chemical casualties. Some of these include Medical Management of Biological Casualties Handbook and Defense Against Toxin Weapons.

In my testimony, I hope to send two tables to be included, one entitled Biological Warfare Agent Characteristics and the other entitled Biological Warfare Agent Treatment. These are, in fact, appendices from the Medical Management of Biological Casualties Handbook and address many of the questions identified.

A field manual has been developed to provide detailed guidance to health care providers. The most recent addition of Field Manual 8–284, titled Treatment of Biological Warfare Agent Casualties, was published in July 2000. This field manual provides in-depth information for the management of these types of casualties. The manual focuses on medical response to biological warfare weapons used against military personnel during military operations. Agent-specific medical preventive and treatment regimens are offered for health care providers.

On your second question, an analysis of research evidence on known treatments, including vaccines, antibiotics and other approaches, the existing evidence on effectiveness of vaccines and antibiotics for prevention or treatment of disease caused by biological threat agents comes from two sources. The first is in the prevention or treatment of human disease in occupational or natural disease settings. As noted by the Centers of Disease Control and Prevention in their publication Biosafety and Microbiological and Microbiomedical Laboratories, that publication has a number 93A395, the use of vaccines has reduced the number of laboratory-acquired infections for a number of agents. They particularly note that no laboratory-associated cases of anthrax have been reported in the United States since the late 1950's, when human anthrax vaccine was introduced.

In the case of the anthrax vaccine, actual clinical field studies were conducted in which the efficacy of the vaccine in reducing cutaneous anthrax in woolen mill workers was demonstrated. The vaccine also appeared to reduce the number of pulmonary anthrax cases, but the numbers were insufficient to achieve good statistical significance.

With respect to the antibiotic treatment, much experience has been gained over the years in treating natural occurrences of the disease caused by various threat agents. For example, bubonic plague, tularemia and cutaneous anthrax occur routinely in humans in the Midwest and western United States.

Similarly the use of Ribavirin, an antiviral drug, has been tested clinically around the world with several viral hemorrhagic fevers, including Lassa fever and Congo Crimean hemorrhagic fever. The medical community has experience in antibiotic and antiviral therapy of these disease presentations. In addition, the sensitivity of biological threat bacteria to various antibiotics can be tested in vitro in the laboratory. Such testing can provide a good indication of which drugs are likely to be effective in treating human disease.

The second source of evidence of the effectiveness of vaccines and therapies comes from studies in animal models. In the laboratory, animals can be immunized with vaccines and then exposed to the biological agent either by injection or by aerosol. Because the battlefield threat is believed to be from an aerosol, large scale delivery of a biological warfare agent, this is the critical route by which testing may be performed. It is almost the most difficult route, and very few organizations have the facilities or trained personnel to accomplish this type of research.

Obviously, there are inherent limitations in what can be achieved in the laboratory, but in general we are able to challenge animals with many hundreds or even thousands of lethal doses of biological threat agent and assess the protection afforded by a vaccine. Protection against an aerosol challenge is one of the critical requirements of our vaccine candidates.

In order to translate the results obtained in animal studies to the effectiveness in humans, we identify and develop surrogate markers of protection that we can measure in humans and use as a basis for inference of protection. Animal models are also used to verify the effectiveness of antibiotics and antivirals that are identified in vitro screening. This is the same standard practice that is used by the pharmaceutical industry.

Sir, I have a long paragraph about our comprehensive list of DOD-funded research addressing vaccines, and I would like to submit that testimony rather than read that.

Mr. BURTON. That will be fine. Do you have quite a bit more in our opening statement, General?

General PARKER. I just would like to read our recommendations on research needed to fill the gaps, if that's possible. Thank you for allowing me to do this.

Recent events have certainly eliminated gaps in our knowledge of medical countermeasures for biological threat agents. In the context of chemical and biological terrorism, the Institute of Medicine in 1999 provided recommendations in their study, Research and Development to Improve Civilian Medical Response, which are as relevant today as they were then. The study identified needs for vaccines, effective drugs, diagnostic technologies, patient management paradigms and many other facets of the response to bioterrorism. Many of these recommendations are being acted upon nationally, but progress takes time.

One need has become strikingly apparent as a result of the current situation, and that is for a national capability to test and evaluate emerging products, existing products, and new technologies for their effectiveness in the prevention, treatment, detection, diagnosis and decontamination of biological threat agents or the diseases caused by them.

As I mentioned earlier, a critical element in evaluation of any of the medical countermeasures is testing and evaluation in animal models, and in particular, the capacity to expose animals to the disease-causing agent in the form of an aerosol. Our national capability to perform these studies and others that necessitate the use of containment laboratories and handling of hazardous biological agents is extremely constrained. Rather than enumerate specific studies that need to be performed sooner rather than later, I would like to identify this shortfall in capability containment laboratories, certain species of animals, trained personnel and the funds required to support them. This is a critical gap.

Thank you very much, sir, for allowing me to read in the testimony.

[The prepared statement of General Parker follows:]

MG John S. Parker

Commanding General

U.S. Army Medical Research and Materiel Command and Fort Detrick

Submitted To

COMMITTEE ON GOVERNMENT REFORM

U. S. HOUSE OF REPRESENTATIVES

FIRST SESSION, 107TH CONGRESS
NOVEMBER 14, 2001

NOT FOR PUBLICATION
UNTIL RELEASED BY THE
COMMITTEE ON GOVERNMENT REFORM
U. S. HOUSE OF REPRESENTATIVES

INTRODUCTION

Chairman Burton and Distinguished Committee Members, thank you for this opportunity to appear before your Committee today to address your questions on the Department of Defense's (DoD) current and proposed medical treatments for bioterrorism. I am Major General John S. Parker, Commanding General of the U.S. Army Medical Research and Materiel Command and Fort Detrick. My testimony today discusses the numerous points requested in your Chairman's letter to The Honorable Donald H. Rumsfeld dated November 9, 2001.

September 11th and the multiple anthrax attacks that have occurred since then are only a small indication of the potential destruction and harm that biological agents can produce. Terrorism, specifically biological terrorism, is an immediate threat to our security both at home and abroad. As our nation addresses this terrifying threat that has invaded our homeland, the Department of Defense is prepared to assist and to support other federal and civilian agencies, as our capability permits.

We can do this because we have already developed a force health protection program that includes not only acknowledgement of the threat, but also development and implementation of a planned multifaceted approach to the medical management of biological warfare (BW) casualties. I would like now to turn to the specific questions that were identified in the invitation to testify.

SPECIFIC POINTS

1. Current recommendations for medical care for individuals both at risk for exposure, and those suspected or known to have been exposed to the most common biologic agents.

Several military publications provide information on the medical management of BW casualties. These serve as guidelines and references for health care providers in handling BW casualties. In addition, the Centers for Disease Control and Prevention issues medical guidance in their weekly publication, Morbidity and Mortality Weekly Report and in special publications.

Pocket-sized handbooks designed to fit in the battle dress uniform (BDU) pockets are routinely published and provided to military health care personnel as field expedient references in the management of NBC casualties. Some of these include "Medical Management of Biological Casualties Handbook" and "Defense Against Toxin Weapons." Two tables are included at the conclusion of this written testimony – one entitled "BW Agent Characteristics" and the other entitled "BW Agents- Vaccine, Therapeutics, and Prophylaxis Treatment." These are, in fact, appendices from the Medical Management of Biological Casualties Handbook and address many of the questions identified.

A field manual (FM) has been developed to provide detailed guidance to health care providers. The most recent edition of FM 8-284 titled "Treatment of Biological Warfare Agent Casualties" was published in July 2000. This FM provides in-depth information for managing BW casualties. The manual focuses on medical response to biological warfare weapons used against military personnel during military operations.

Agent-specific medical preventive and treatment regimens are offered for health care providers. In addition to specifics about the medical management of the effects of BW weapons, also included are methods of delivery, portals of entry, environmental detection, use of personal protective equipment (PPE), and case reporting. Detailed guidance is provided concerning collection of human specimens for diagnostic purposes, as well as handling, shipping, and chain of custody responsibilities. Initial response first aid, protective measures and handling of casualties, patient decontamination, infection control principles, and medical evacuation are also discussed.

2. An analysis of research evidence on known treatments including vaccines, antibiotics, and other approaches.

The existing evidence on effectiveness of vaccines and antibiotics for prevention or treatment of diseases caused by biological threat agents comes from two sources. The first is in the prevention or treatment of human disease in occupational or natural disease settings. As noted by the Centers for Disease Control and Prevention in their publication "Biosafety in Microbiological and Biomedical Laboratories" (HHS Publication No. (CDC) 93-8395), the use of vaccines has reduced the number of laboratory acquired infections for a number of agents. They particularly note that "No laboratory-associated cases of anthrax have been reported in the United States since the late 1950s when human anthrax vaccine was introduced." (4th Edition, pg. 88) In the case of the anthrax vaccine, actual clinical field studies were conducted in which the efficacy of the vaccine in reducing cutaneous anthrax in woolen mill workers was demonstrated.

The vaccine also appeared to reduce the number of pulmonary anthrax cases but the numbers were insufficient to achieve good statistical significance. With respect to antibiotic treatment, much experience has been gained over the years in treating natural occurrences of disease caused by various threat agents. For example, bubonic plague, tularemia and cutaneous anthrax occur routinely in humans in the mid-west and western United States. Similarly, the use of ribavirin, an antiviral drug, has been tested clinically around the world with several viral hemorrhagic fevers including Lassa fever and Congo-Crimean hemorrhagic fever; although it has not been FDA-approved for these diseases. The medical community has experience in antibiotic and antiviral therapy of these disease presentations. In addition, the sensitivity of biological threat bacteria to various antibiotics can be tested in vitro, in the laboratory. Such testing can provide a good indication of which drugs are likely to be effective in treating human disease.

The second source of evidence of the effectiveness of vaccines and therapies comes from studies in animal models. In the laboratory, animals can be immunized with vaccines and then exposed to the biological agent either by injection or by aerosol. Because the battlefield threat is believed to be from an aerosol, large-scale delivery of a BW agent, this is the critical route by which testing must be performed. It is also the most difficult route, and very few organizations have the facilities or trained personnel to accomplish this type of research. Obviously, there are inherent limitations in what can be achieved in the laboratory, but in general, we are able to challenge animals with many hundreds or even thousands of lethal doses of a biological threat agent, and assess the protection afforded by a vaccine. Protection against an aerosol challenge is one of the critical requirements for our vaccine candidates and antimicrobials. In order

to translate the results obtained in animal studies to effectiveness in humans, we identify and develop surrogate markers of protection that we can measure in humans and use a basis for inference of protection. Animal models are also used to verify the effectiveness of antibiotics and antivirals that are identified by in vitro screening. This is the same standard practice as used by the pharmaceutical industry.

3. A comprehensive list of DoD-funded research addressing vaccines, treatments and detection devices, including complementary and alternative therapies and digital biology.

The Chemical Biological Defense Program is a Joint program managed by the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense. The program is managed in five commodity areas: Contamination Avoidance (which includes detection systems), Protection (Individual and Collective), Medical, Decontamination, and Modeling and Simulation. The medical research program encompasses more mature efforts that are captured in Defense Technology Objectives (DTOs) as well as efforts in the technology base that are managed in the domains of Vaccines, Therapeutics and Diagnostics. The current medical biological defense program Defense Technology Objectives include: CB.24, Medical Countermeasures for Encephalitis Viruses; CB.25, Multiagent Vaccines for Biological Threat Agents; CB.26. Common Diagnostic Systems for Biological Threats and Endemic Infectious Diseases; CB.27, Therapeutics Based on Common Mechanisms of Pathogenesis; CB.31, Medical Countermeasures for Brucellae; CB.32, Needle-less Delivery Methods for Recombinant Protein Vaccines; CB.33, Recombinant Protective Antigen Anthrax Vaccine Candidate;

CB.34, Recombinant Plague Vaccine; and CB.38, Activity Based Detection and Diagnostics. Note that two of these Objectives (CB.27 and CB.38) are part of the Defense Advanced Research Projects Agency (DARPA) research program and are closely integrated with the medical research efforts. Advanced development efforts for smallpox, tularemia, Venezuelan equine encephalitis and botulinum toxin vaccines are in progress.

I would like to highlight the effort of the U.S. Army Medical Research Institute of Infectious Diseases in developing a new candidate for a next generation anthrax vaccine, the recombinant Protective Antigen. In partnership with the Joint Vaccine Acquisition Program, their prime systems contractor, Dynport Vaccine Corporation, and the National Institutes of Health, this vaccine will enter clinical trials in the near future.

Research efforts that have not yet reached the maturity of a Defense Technology Objective include studies of vaccines for viruses such as Ebola and Marburg; new approaches to smallpox vaccine; and supporting research for the encephalitis viruses. Vaccine research for bacterial agents, in addition to those identified above in DTOs, include studies on glanders and meliodosis. Vaccine research efforts on toxins include recombinant vaccine approaches for the staphylococcal enterotoxins and ricin. Modern vaccine candidates for several types of botulinum toxins transitioned to advanced development recently.

In the area of therapeutics, we leverage the biotechnology and pharmaceutical industries and partner with the National Institutes of Health in order to gain access to promising new antimicrobial and antiviral drugs. Using this mechanism, we have identified promising candidates for smallpox therapeutics, one of which is a drug already

licensed for another indication. The data generated in our laboratories in animal studies of treatment of anthrax with ciprofloxacin was used by the Food and Drug Administration as the basis for their approval of the labeling change for that drug, and more recently, for doxycycline and penicillin for use in treatment of pulmonary anthrax. Additional novel therapeutic approaches are being explored in partnership with investigators from the DARPA Unconventional Pathogens Countermeasures Program, who we are supporting with funds identified specifically for "DARPA transition" into our core research program. Other complementary and alternative approaches are being explored with investigators such as Dr. Ken Alibek, who was the recipient of congressionally directed funds that we manage within our medical research program.

I am interpreting "digital biology" to mean the application of information technologies to the biological threat problem. We, in concert with the national laboratories and others, have embarked on efforts in research to understand virulence factors, host factors and the basis of infectivity or toxicity of the biological threat agents. These efforts are grouped under the terminology "genomics" and "proteomics". We anticipate that in the future, these studies will allow us to advance our research on the current threat agents, and hasten the development of medical countermeasures, as well as form the basis of our preparedness for future threats.

Detection devices are managed by the Soldier, Biological and Chemical Command. In the far term, the focus is on technologies that will unite chemical and biological point and stand-off detectors into a single system. Within the Stand-Off/Early Warning Detection technology base, efforts currently focus on various platforms and technologies to include LIDAR and other spectroscopic detection methods for chemical

stand-off detection. Biological Stand-Off detection is captured in a new DTO, CB.35 – Stand-off Biological Aerosol Detection, and relies on ultraviolet laser induced fluorescence as the basis of detection. Other regions of the spectrum as well as polarization techniques are also being explored for both chemical and biological detection. Point detection technologies for biological agent identification are more mature than the stand-off technologies, and include efforts in agent identification, reagent development, chemical/biological identification in food/water, and integration of point chem./bio detection in a single detector. This research is supported by the DTO CB.20, Biological Sample Preparation System for Biological Identification. The technical approach in this DTO was closely coordinated with research in medical diagnostics, since both relied on analysis of genetic material in addition to immunological methods to identify agents.

Our medical diagnostic technologies have been leveraged in the detection community because current detector systems, such as the Portal Shield, require confirmatory analysis of positive samples identified by the built-in immunologically based assays. We provide this capability both in the reference laboratory, USAMRIID, as well as in the deployable laboratory, the Theater Army Medical Laboratory, part of the 44th Medical Brigade. Air Force and Navy laboratories possess similar, but more restricted, capabilities.

4. Recommendations on research needed to fill evidence gaps.

Recent events have certainly illuminated gaps in our knowledge of medical countermeasures for biological threat agents. In the context of chemical and biological

terrorism, the Institute of Medicine in 1999 provided recommendations in their study "Research and Development to Improve Civilian Medical Response" which are as relevant today as they were then. The study identified needs for vaccines, effective drugs, diagnostic technologies, patient management paradigms, and may other facets of the response to bioterrorism. Many of these recommendations are being acted upon nationally, but progress takes time.

One need has become strikingly apparent as a result of the current situation, and that is for a national capability to test and evaluate emerging products, existing products, and new technologies for their effectiveness in prevention, treatment, detection, diagnosis, and decontamination of biological threat agents or the diseases caused by them. As I mentioned earlier, a critical element in evaluation of any of the medical countermeasures is testing and evaluation in animal models, and in particular, the capability to expose animals to the disease-causing agent in the form of an aerosol. More could be done to train personnel and address our national capability to perform these studies and others that necessitate the use of containment laboratories and handling of hazardous biological agents. Rather than enumerate specific studies that need to be performed sooner rather than later, I would like to identify this shortfall in capability – containment laboratories, certain species of animals, trained personnel, and the funds required to support them – as the critical gap.

5. Comprehensive explanation of the level of protection offered by current treatments as well as known risks, side effects and contraindications.

I believe that the issue of level of protection offered by current treatments has been addressed in the discussion in section 2. above, along with the additional material that was provided. All medical prophylaxes or treatments involve a risk/benefit assessment: will the patient be better off given the probable risk of disease, injury or death versus the risk that they sustain in receiving the medical product, a vaccine or drug? The risks, side effects and contraindications for licensed antibiotics and vaccines that have been used in large numbers of people are fairly well understood and documented. The entire regulatory process of the Food and Drug Administration (FDA) is geared towards reducing risk and ensuring that only products that are acceptably safe and effective are approved.

The challenge in medical biological defense is that we cannot conduct efficacy tests of our countermeasures in humans, because it would be unethical to deliberately expose them to threat agents, and naturally occurring outbreaks of disease caused by these agents are generally small, sporadic and rare. In addition, the natural disease (plague, for example) is usually not transmitted by the aerosol, or threat, route. Thus, we can estimate efficacy based on animal studies, and conduct the requisite safety studies in both animals and humans. That being said, the detection of rare adverse reactions or events requires large numbers of people – far more than can feasibly be included in a clinical trial. Thus, we proceed carefully, and will need to continually monitor the use of any of our drugs or vaccines in the population to which they are administered in order to identify those very infrequent or rare events. This is post-marketing surveillance and we will need to be vigilant.

6. Explanation of the training offered to military medical personnel on comprehensive medical care, including nutritional support for personnel on antibiotics.

In recent years, the Department of Defense has increased emphasis on readiness in response to the heightened threat of biological weapons. Training has increased at all levels—from the individual to large units -- both medical and non-medical. We have developed numerous training courses and other resources focused on the medical response to biological events. Some of the courses include:

- "Medical Management of Chemical and Biological Casualties Course" (MCBC). A six and a half-day course focused on the potential threat of chemical and biological weapons, and the status and extent of preventive and treatment countermeasures available. Since Fiscal Year 1997, over 7,800 military health care professionals from all services completed the course.
- "Field Management of Chemical and Biological Casualties Course" (FCBC). A five-day course that provides detailed training in the initial management of chemical and biological agent casualties. This course is also an exportable 3-day on-site course. Since Fiscal Year 1999, over 1,700 officers and enlisted personnel have been trained from all Services.
- "Medical Management of Chemical and Biological Casualties Course." A three-day course targeting providers, taught by Navy Environmental Health Center (NEHC) and Navy Environmental and Preventive Medicine Unit (NEPMU) personnel in Norfolk, San Diego, Pearl Harbor, and Sigonella. From 1999 to present, 1,957 people have received this training.

- "Medical Management of Chemical and Biological Casualties Course." A one-day familiarization course targeting medical personnel other than providers, taught by NEHC and NEPMU staff. From 1999 to present, 3,316 people have received this training.
- Satellite training courses.
- "Biological Warfare and Terrorism: Medical Issues and Response" first developed in collaboration with the FDA in 1997 and broadcast to over 5,000 military and civilian health professionals and first responders at 249 sites across the United States. Since then, three more satellite courses were developed and broadcast in 1998, 1999 and 2000. Over 22,000 military and 30,000 civilian personnel have completed the course.
- "The Medical Response to Chemical Warfare and Terrorism" developed in collaboration with the Food and Drug Administration and broadcast in 1999, and again in 2000 to over 5,500 military health care professionals.
- "Biological and Chemical Warfare and Terrorism: Medical Issues and Response" was aired live on November 28-30, 2001 with a taped rebroadcast scheduled for December 8-9. Currently, over 700 military and civilian sites are signed up to receive the broadcast.

Our Uniformed Services University of the Health Sciences has robust and long-standing educational programs in the medical aspects of biological terrorism developed for our military medical students and graduate students. The University is now actively involved in adapting these programs to the civilian medical education community in both traditional and interactive web-based formats. The University works closely with other

federal agencies, the private sector, and the American Association of Medical Colleges and the American Medical Association to accomplish these important and timely educational goals. Finally, the University will be a major contributor in the American Association of Medical Colleges' "Health Education Coalition on Bioterrorism" conference later this month.

CONCLUSION

The Department's priority is and has always been our men and women in uniform. They are our greatest assets. And because they are, preventing or minimizing the effects of biological warfare agents is one of our highest priorities. We will continue to work that way, keeping their health protection first and foremost.

Thank you for the opportunity to appear before you today; we appreciate the committee's continued commitment to all our service members and look forward to working together to keep their safety and protection our first priority.

BW Agent Characteristics

Note: The therapies and prophylaxes described below are as used in clinical practice, but they may not reflect FDA-approved labeling of the particular products.

Disease	Transmit Man to Man	Infective Dose (Aerosol)	Incubation Period	Duration of Illness	Lethality (approx. case fatality rates)	Persistence of Organism	Vaccine Efficacy (aerosol exposure)
Inhalation anthrax	No	8,000-50,000 spores	1-6 days	3-5 days (usually fatal if untreated)	High	Very stable - spores remain viable for > 40 years in soil	2 dose efficacy against up to 1,000 LD_{50} in monkeys
Brucellosis	No	10 -100 organisms	5-60 days (usually 1-2 months)	Weeks to months	<5% untreated	Very stable	No vaccine
Cholera	Rare	10-500 organisms	4 hours - 5 days (usually 2-3 days)	≥ 1 week	Low with treatment, high without	Unstable in aerosols & fresh water; stable in salt water	No data on aerosol
Glanders	Low	Assumed low	10-14 days via aerosol	Death in 7-10 days in septicemic form	> 50%	Very stable	No vaccine
Pneumonic Plague	High	100-500 organisms	2-3 days	1-6 days (usually fatal)	High unless treated within 12-24 hours	For up to 1 year in soil; 270 days in live tissue	3 doses not protective against 118 LD_{50} in monkeys
Tularemia	No	10-50 organisms	2-10 days (average 3-5)	≥ 2 weeks	Moderate if untreated	For months in moist soil or other media	80% protection against 1-10 LD_{50}
Q Fever	Rare	1-10 organisms	10-40 days	2-14 days	Very low	For months on wood and sand	94% protection against 3,500 LD_{50} in guinea pigs
Smallpox	High	Assumed low (10-100 organisms)	7-17 days (average 12)	4 weeks	High to moderate	Very stable	Vaccine protects against large doses in primates
Venezuelan Equine Encephalitis	Low	10-100 organisms	2-6 days	Days to weeks	Low	Relatively unstable	TC 83 protects against 30-500 LD_{50} in hamsters
Viral Hemorrhagic Fevers	Moderate	1-10 organisms	4-21 days	Death between 7-16 days	High for Zaire strain, moderate with Sudan	Relatively unstable - depends on agent	No vaccine
Botulism	No	0.001 μg/kg is LD_{50} for type A	1-5 days	Death in 24-72 hours; lasts months if not lethal	High without respiratory support	For weeks in nonmoving water and food	3 dose efficacy 100% against 25-250 LD_{50} in primates
Staph Enterotoxin B	No	0.03 μg/person incapacitation	3-12 hours after inhalation	Hours	< 1%	Resistant to freezing	No vaccine
Ricin	No	3-5 μg/kg is LD_{50} in mice	18-24 hours	Days - death within 10-12 days for ingestion	High	Stable	No vaccine
T-2 Mycotoxins	No	Moderate	2-4 hours	Days to months	Moderate	For years at room temperature	No vaccine

BW Agents - Vaccine, Therapeutics, and Prophylaxis

DISEASE	VACCINE	CHEMOTHERAPY (Rx)	CHEMOPROPHYLAXIS (Px)	COMMENTS
Anthrax	Bioport vaccine (licensed) 0.5 mL SC @ 0, 2, 4 wk, 6, 12, 18 mo then annual boosters	Ciprofloxacin 400 mg IV q 12 h or Doxycycline 200 mg IV, then 100 mg IV q 12 h	Ciprofloxacin 500 mg PO bid x 4 wk if unvaccinated, begin initial doses of vaccine	Potential alternates for Rx: gentamicin, erythromycin, and chloramphenicol
		Penicillin 4 million units IV q 4 h	Doxycycline 100 mg PO bid x 4 wk plus vaccination	PCN for sensitive organisms only
Cholera	Wyeth-Ayerst Vaccine 2 doses 0.5 mL IM or SC @ 0, 7-30 days, then boosters Q 6 months	Oral rehydration therapy during period of high fluid loss	NA	Vaccine not recommended for routine protection in endemic areas (50% efficacy, short term)
		Tetracycline 500 mg q 6 h x 3 d		Alternates for Rx: erythromycin, trimethoprim and sulfamethoxazole, and furazolidone
		Doxycycline 300 mg once, or 100 mg q 12 h x 3 d		
		Ciprofloxacin 500 mg q 12 h x 3 d		Quinolones for tetra/doxy resistant strains
		Norfloxacin 400 mg q 12 h x 3 d		
Q Fever	IND 610 - inactivated whole cell vaccine given as single 0.5 ml s.c. injection	Tetracycline 500 mg PO q 6 h x 5-7 d continued at least 2 d after afebrile	Tetracycline 500 mg PO qid x 5 d (start 8-12 d post-exposure)	Currently testing vaccine to determine the necessity of skin testing prior to use.
		Doxycycline 100 mg PO q 12 h x 5-7 d continued at least 2 d after afebrile	Doxycycline 100 mg PO bid x 5 d (start 8-12 d post-exposure)	
Glanders	No vaccine available	Antibiotic regimens vary depending on localization and severity of disease - refer to text	Post-exposure prophylaxis may be tried with TMP-SMX	No large therapeutic human trials have been conducted owing to the rarity of naturally occurring disease.
Plague	Greer inactivated vaccine (FDA licensed) is no longer available.	Streptomycin 30 mg/kg/d IM in 2 divided doses x 10 – 14 d or Gentamicin 5mg/kg or IV once daily x 10 - 14 d or Ciprofloxacin 400mg IV q 12 h until clinically improved then 750 mg PO bid for total of 10 –14 d	Doxycycline 100 mg PO bid x 7 d or duration of exposure Ciprofloxacin 500 mg PO bid x 7 d	Chloramphenicol for plague meningitis is required 25 mg/kg IV, then 15 mg/kg qid x 14 d
		Doxycycline 200 mg IV then 100 mg IV bid, until clinically improved then 100mg PO bid for total of 10-14 d	Tetracycline 500 mg PO qid x 7 d	Alternate Rx: trimethoprim-sulfamethoxazole
Brucellosis	No human vaccine available	Doxycycline 200 mg/d PO plus rifampin 600 mg/d PO x 6 wk	Doxycycline 200 mg/d PO plus rifampin 600 mg/d PO x 6 wk	Trimethoprim-sulfamethoxazole may be substituted for rifampin; however, relapse may reach 30%
		Ofloxacin 400/rifampin 600 mg/d PO x 6 wks		

DISEASE	VACCINE	CHEMOTHERAPY (Rx)	CHEMOPROPHYLAXIS (Px)	COMMENTS
Tularemia	IND - Live attenuated vaccine: single 0.1ml dose by scarification	Streptomycin 7.5-10 mg/kg IM bid x 10-14 d	Doxycycline 100 mg PO bid x 14 d	
		Gentamicin 3-5 mg/kg/d IV x 10-14 d	Tetracycline 500 mg PO qid x 14 d	
		Ciprofloxacin 400 mg IV q 12h until improved, then 500 mg PO q 12 h for total of 10 - 14 d	Ciprofloxacin 500 mg PO q 12 h for 14 d	
		Ciprofloxacin 750 mg PO q 12 h for 10 - 14 d		
Viral encephalitides	VEE DOD TC-83 live attenuated vaccine (IND): 0.5 mL SC x1 dose	Supportive therapy: analgesics and anticonvulsants prn	NA	TC-83 reactogenic in 20% No seroconversion in 20% Only effective against subtypes 1A, 1B, and 1C
	VEE DOD C-84 (formalin inactivated TC-83) (IND): 0.5 mL SC for up to 3 doses			C-84 vaccine used for non-responders to TC-83
	EEE inactivated (IND): 0.5 mL SC at 0 & 28 d			EEE and WEE inactivated vaccines are poorly
	WEE inactivated (IND): 0.5 mL SC at 0, 7, and 28 d			Immunogenic. Multiple immunizations are required
Viral Hemorrhagic Fevers	AHF Candid #1 vaccine (x-protection for BHF) (IND)	Ribavirin (CCHF/Lassa) (IND) 30 mg/kg IV initial dose; then 16 mg/kg IV q 6 h x 4 d; then 8 mg/kg IV q 8 h x 6 d	NA	Aggressive supportive care and management of hypotension very important
	RVF inactivated vaccine (IND)	Passive antibody for AHF, BHF, Lassa fever, and CCHF		
Smallpox	Wyeth calf lymph vaccinia vaccine (licensed): 1 dose by scarification	No current Rx other than supportive; Cidofovir (effective in vitro); animal studies ongoing	Vaccinia immune globulin 0.6 mL/kg IM (within 3 d of exposure, best within 24 h)	Pre and post exposure vaccination recommended if > 3 years since last vaccine
Botulism	DOD pentavalent toxoid for serotypes A - E (IND): 0.5 ml deep SC @ 0, 2 & 12 wk, then yearly boosters	DOD heptavalent equine despeciated antitoxin for serotypes A-G (IND): 1 vial (10 mL) IV	NA	Skin test for hypersensitivity before equine antitoxin administration
		CDC trivalent equine antitoxin for serotypes A, B, E (licensed)	NA	
Staphylococcus Enterotoxin B	No vaccine available	Ventilatory support for inhalation exposure	NA	
Ricin	No vaccine available	Inhalation: supportive therapy G-I : gastric lavage, superactivated charcoal, cathartics	NA	
T-2 Mycotoxins	No vaccine available		Decontamination of clothing and skin	

Mr. BURTON. Thank you, General. We have three votes pending on the floor, and I really apologize because it is going to take us probably 25 to 30 minutes before we get back. We will stand in recess until the fall of the gavel and we should be back here a little after 2 o'clock. So if any of you want to do something for about 30 minutes, make yourselves at home. We will be right back. Thank you.

[Recess.]

Mr. BURTON. The committee will reconvene. Other Members are on their way back from the floor, so we'll get to them as soon as they arrive.

Dr. Straus, would you like to make your opening statement?

Dr. STRAUS. Yes. Thank you, Mr. Chairman, members of the committee. I submitted fuller testimony. I'll make some brief opening remarks and await your questions.

As a physician who for the past 25 years I have specialized in the care of patients with severe and life-threatening infections and as a public health official, I fully support the current CDC recommendations for managing potential exposure to and infection by anthrax. The success of current efforts to locate and disinfect contaminated sites and dispense effective antibiotics to those exposed is evidenced by the small numbers of infected persons and the even smaller numbers, fortunately, of serious illnesses or deaths that have resulted from such exposures.

The specific question you asked me to address today, Mr. Chairman, in my capacity as director of the National Center for Complementary and Alternative Medicine [NCCAM] is whether there are additional health tools and practices that could effectively serve as alternatives or as complements to those ones already implemented to prevent or treat diseases from biological weapons.

Many of these alternative approaches were displaced by the emergence of evidenced-based medicine. Before the articulation of the germ theory of disease in the late 19th century and the subsequent development of vaccines and antibiotics, people believed that specific rituals and selected herbal extracts and tonics would, in current parlance, eliminate the offending pathogens or boost one's resistance to them. In fact, a characteristic shared by many of the traditional healing systems of indigenous peoples, such as Ayurvedic medicine, various forms of oriental medicine and the more recently developed systems, like Naturopathy, is an emphasis on maximizing the body's inherent capacity to heal itself.

While augmenting one's own natural healing powers may prove beneficial for some diseases and is the focus of much of the work funded today by the NCCAM, there is no scientific basis to believe that this approach would be of value in the context of virulent diseases incited by biological weapons.

From the perspective of contemporary immunology, diseases like anthrax, smallpox and tularemia exceed one's innate immunity to control them and progress too rapidly for specific and protective antibody and lymphocyte responses to evolve. Simply stated, Mr. Chairman, they can kill us before we can arm ourselves fully to defend against them.

Had the traditional healing rituals and natural products available to pre-20th century man been truly effective, our history

would have been rather different. Through the availability of cleaner water, uncontaminated foodstuffs and vaccines and antibiotics, human life span has increased by a greater proportion in the past century than through all recorded history up to that time.

Despite these impressive public health achievements, people still turn today to natural products, hoping for them to help mitigate infections. While these may be justifiable decisions as regards milder and more self-limiting conditions, we must discourage any assumption that these products can serve in lieu of proven drugs like ciprofloxacin or doxycycline for people exposed to anthrax bacilli. It may even not be prudent to combine such natural products with antibiotics because of the possibility that they would interfere with the proper metabolism and action of drugs.

For example, calcium supplements have been shown to reduce the body's content of ciprofloxacin by over 40 percent. Even though there is some doubt that certain approaches involving herbs, homeopathic medicines, essential oils or colloidal silver could be effective for diseases like anthrax or smallpox, we cannot prove the claims to be entirely specious. It would be unethical and dangerous to withhold drug and vaccines in order to see whether the alternative remedies protect people who become exposed. Exploration of such exposures should first involve careful studies in animals using contemporary methodologies to discern whether they hold any promise against diseases associated with biological weapons. In the interim, however, lacking any competent evidence that they work, the claims about these products are dangerous both to the individual who uses them and to the population in general who might become infected if some others refuse standard treatments.

In conclusion, Mr. Chairman, in the instance of bioterrorism, the best approach is to manifest, as I do, an unwavering trust in the currently approved drugs and vaccines and not to dissipate our energies or to distract the public by pursuing unproven remedies. The stakes are simply too high at this time of national emergency to do otherwise.

I would be happy to take any questions you may have about NCCAM's responses to bioterrorism. Thank you.

Mr. BURTON. Thank you, Dr. Straus.

[The prepared statement of Dr. Straus follows:]

Testimony
Before the Committee on Government Reform
United States House of Representatives

Comprehensive Medical Care for Bioterrorism Exposure - - Are We Making Evidenced Based Decisions?

Statement of
Stephen E. Straus, M.D.
Director, National Center for Complimentary and Alternative Medicine, National Institutes of Health, Department of Health and Human Services

For Release on Delivery
Expected at 1:00 pm

on Wednesday, November 14, 2001

Mr. Chairman and Members of the Committee:

As we sit here, our fellow Americans are confronted by the fearsome prospect of exposure to lethal biological weapons. In response, there is great interest in exploring every potential means of preventing or mitigating the health effects of such exposures to themselves and their loved ones. You invited my colleagues and me to comment on the potential value and wisdom of some of these approaches.

As a physician who for the past 25 years has specialized in the care of patients with severe and life-threatening infections, and as a public health official, I fully support the current CDC recommendations for managing potential exposure to and infection by anthrax. Moreover, I am impressed by the efforts already mounted at the Federal, State, and local levels in response to the intentional and malicious dissemination of anthrax spores. The success of current efforts to locate and disinfect contaminated sites and dispense effective antibiotics to those exposed is evidenced by the small numbers of infected persons and the even smaller numbers of serious illnesses or death that have resulted from such exposures. This has afforded us all some measure of comfort. To a great extent, we are able, as the President has urged, to pursue our normal activities.

In addition to the already proven means of detecting anthrax spores and preventing or treating exposures to them and other potential pathogens, there is the very real promise that research will reveal additional and even more effective strategies. Those efforts being mounted through the

formidable scientific infrastructure of the National Institute of Allergy and Infectious Diseases will be summarized here today by my colleague Dr. Carole Heilman.

The specific question you asked me to address today, Mr. Chairman, in my capacity as Director of the National Center for Complementary and Alternative Medicine (NCCAM) is whether there are additional health tools and practices that could effectively serve as alternatives or as complements to the ones already implemented or forecast here by Dr. Heilman to prevent or treat diseases from biological weapons. In response to this, let me say first, that as public servants it would be unworthy and unwise of us to do anything but place our fullest confidence in those well-considered resources that our public health authorities have already summoned to meet the current national and personal threats.

Yet, we know that no measures, except for some vaccines, including the proven ones already being used, can totally prevent infection by virulent biological agents once they are deployed, and no words of comfort or medications are in themselves sufficient to fully allay the concerns that we may fall prey to such weapons. Understandably, people are seeking additional measures to safeguard their health and that of their loved ones. The issue is not whether there is justification for continuing concern, but whether the measures that some are promoting do anything more than prey upon people's fears and distract them from taking more prudent steps to protect themselves.

Some of the approaches now being considered by our frightened countryman are ones that were largely displaced by the emergence of scientific medicine. Before the articulation of the germ theory of disease in the late 19th century and the subsequent development of vaccines and antibiotics, people sought protection from epidemic diseases through a variety of spiritual exercises and by ingesting natural products. It was believed that specific rituals and selected herbal extracts and tonics would, in current parlance, eliminate the offending pathogens or boost one's resistance to them. In fact, a characteristic shared by many of the traditional healing systems of indigenous peoples, such as Ayurvedic medicine, various forms of oriental medicine, and the more recently developed systems like Naturopathy, is an emphasis on maximizing the body's inherent capacity to heal itself.

While augmenting one's natural healing powers may prove beneficial for some illnesses, and is a focus of much work funded by NCCAM, there is no scientific basis to believe that this approach would be of much value in the context of virulent diseases incited by biological weapons. From the perspective of contemporary immunology, diseases like anthrax, smallpox, and tularemia exceed one's innate immunity to control them, and progress too rapidly for specific and protective antibody and lymphocyte responses to evolve. Simply stated, they can kill us before we can arm ourselves fully to defend against them.

As the eminent microbiologist Hans Zinnser concluded some 65 years ago in his acclaimed book entitled "Of Rats, Lice and History" the course of human history has been indelibly marked and

shaped by plagues. Measles, yellow fever, cholera, bubonic plague, smallpox, typhus, syphilis and tuberculosis, and HIV in the current era, have exterminated native peoples and forced wholesale migrations of populations. Had the traditional healing rituals and natural products available to pre-20th Century man been truly effective, our history would have been rather different. Through the availability of cleaner water, uncontaminated foodstuffs, and vaccines and antibiotics, human lifespan has increased by a greater proportion in the past century than through all recorded history up to that time.

Despite these impressive public health achievements, people still turn today to natural products hoping them to help mitigate infections. Among the most popular of these products for the American consumer is Echinacea, a widespread herbal medicine. Small studies suggest that it might lessen the severity of colds and the flu. Therefore, we in NCCAM are funding substantive and rigorous studies to determine whether the preliminary observations about Echinacea hold up. Nonetheless, even if Echinacea proves to mitigate simple viral respiratory infections that almost always resolve on their own, it would be a far stretch to believe that it could prevent or ameliorate highly virulent and disseminated bacterial or viral diseases with high mortality rates. We must discourage any assumption that products like Echinacea may serve in lieu of proven drugs like ciprofloxacin or doxycycline for people exposed to anthrax bacilli.

It may not even be prudent to combine such natural products with antibiotics because of the possibility that they would interfere with the proper metabolism and action of the drugs. An

instructive example in this regard is the effect of the herb St. Johns wort on the metabolism of indinavir, a drug that has helped extend the lives of countless patients with HIV/AIDS. St. Johns wort accelerates removal of indinavir from the body, leaving drug levels that no longer are adequate to block the replication of the HIV virus.

Traditional healers of several Asian countries prescribed specific rituals, exercises, diets and herbal remedies for the treatment of virulent infections. Yet, there is no evidence that these were of any value. In Korea, for example, the primary approach to contagious diseases like typhoid and malaria involved spiritual exorcisms. Smallpox was especially feared and the deity Sonnim had to be assuaged if one hoped to resolve the disease. In India, relief required homage to the smallpox goddess Sitala.

Apparently, some ancient preventative strategies were more effective. From the time of the great Moslem physician Avicenna of the 10th Century, Persians exposed their children to cows infected with cowpox to protect them from smallpox. Variolation with dried smallpox scabs was practiced in China and Korea centuries before Jenner proved the effectiveness and greater safety of classical vaccination. Since Jenner's time, immunity to infectious agents has been induced by administering small amounts of avirulent microbial components. This is the well-proven basis for routine immunizations, as for measles or polio, and which permitted the global eradication of natural smallpox in the 1970s.

Testimony of Rich Klasco, M.D.

Vice President, Micromedex Corporation

Before the

House Committee on Government Reform

November 14, 2001

Mr. Chairman and distinguished members of the Committee, I appreciate the opportunity to testify before you today.

September 11 taught us many things, good and bad.

One good thing we learned is that America has over 57,000 heroic agencies on call, 24 hours a day, seven days a week. Police, firefighters, emergency responders and health care providers, who deserve our very special praise. Together with the brave men and women in our armed forces, they are on the front lines of this new war against terrorism.

Another thing we learned is that every American police station, fire department, and emergency medical service—and, indeed, every potential American victim of biological terrorism--has an urgent need for quick access to comprehensive and accurate information to assist in triage and treatment.

Mr. Chairman, I know the importance of this from my personal experiences as an emergency room physician. When a life is in your hands, and you have only minutes, sometimes seconds, to make the right decision, you need information--good, hard, quick information.

I was on call in the ER on the day of the Columbine High School shootings. Wounded students soon arrived who had suffered gunshot trauma to both their spinal columns and their bowels. The problem this situation poses is that the recommended drug treatment for spinal injury is also known to seriously heighten the risk of severe infection, and such infection can be a major life-threatening complication of a bowel injury. In order to decide whether to administer this drug, I (along with two colleagues) consulted a computerized medical information database in the ER. We were able to quickly retrieve the information we needed to make a sound and immediate medical care decision.

The information that I used the day of the Columbine shootings – and many times before and since – and the computer system that provided me access to that information in the ER, is what is known in the medical field as "decision support" technology. It allows a care giver real time access to information that can confirm or correct a diagnosis or treatment and, in the process, improve medical outcomes.

products are dangerous both to the individual who uses them and to the population in general who might become infected if some refuse standard treatments.

Another example of products being marketed by internet vendors to a frightened populace involves colloidal silver. Silver, like many substances, does possess antibacterial properties *in vitro*, rendering it a topical disinfectant. Its systemic use in humans, though, is limited by its toxicity. Even more serious illnesses and death were associated with exposure to heavy metals such as arsenic that was long included in popular remedies.

In conclusion, Mr. Chairman, we in NCCAM commit ourselves to apply exacting research methods to expand the repertoire of healthcare tools for countless medical conditions. We enjoy the generous support of the American people and appreciate the partnerships we have established with the other NIH institutes and centers and research agencies in this undertaking. In the instance of bioterrorism, however, the best approach is to manifest, as I do, an unwavering trust in the currently approved drugs and vaccines, and to not dissipate our energies or to distract the public by pursuing unproven remedies. The stakes are simply too high at this time to do otherwise.

I would be happy to take any questions you might have with regard to NCCAM and complementary and alternative responses to bioterrorism.

Mr. BURTON. Dr. Heilman.

Ms. HEILMAN. Mr. Chairman and members of the committee, thank you for inviting me here today to discuss the medical response to bioterrorism as well as current efforts by the NIH to facilitate basic and clinical research related to the prevention and treatment of bioterrorism agents. In just the past 2 months we have witnessed the deliberate mailing of spores of anthrax, including the exposure of members of this esteemed body to this deadly bacterium. Federal health agencies have responded by evaluating and accelerating measures to protect the public from the health consequences of such an attack.

Today I will describe one component of the national effort. As part of the NIH, the National Institute of Allergy and Infectious Diseases supports research on the diagnosis, prevention and treatment of infections caused by a wide variety of pathogens, including organisms of bioterrorism such as anthrax, smallpox, plague, tularemia, viral hemorrhagic fevers, and botulism.

To meet the challenges posed by bioterrorism, especially to civilians, NIH supports research in the basic biology and disease-causing mechanisms of pathogens, the development of rapid and sensitive diagnostic tools, the creation of new vaccines using both traditional and novel technologies and the design of new therapeutic agents. To address the specific interest of this committee, I have provided you a compendium of NIH-funded research and a bibliography of published research articles related to vaccines and treatments of potential agents of bioterrorism in appendices A and B, respectively, of the written testimony. The current recommendations for medical care of a wide variety of potential agents of bioterrorism can be found in appendix C. Appendix D is a copy of the Health and Human Services' action plan on antimicrobial resistance.

I would like to spend the remainder of my time providing examples of the research efforts that have been initiated and accelerated for two bioterrorist threats of particular concern, smallpox and anthrax. Smallpox is considered one of the most dangerous potential biological weapons, because it is easily transmitted from person to person and because few people carry full immunity to the virus. Smallpox vaccine has proven to be highly effective in preventing infection and was an essential factor in the global eradication of smallpox in 1977.

Vaccinations to prevent smallpox have not been required in the United States since 1972. In the near term, a bioterrorist attack involving smallpox would require the utilization of stores of the existing smallpox vaccine to protect those at immediate risk. The current stock of Dryvax vaccine, approximately 15 million doses, clearly would not be enough to respond to a national smallpox epidemic.

Last year, NIAID conducted a study to determine whether this vaccine had maintained its potency over the years. As a next step, we wanted to determine if a diluted vaccine, combined with an alternative vaccination schedule, could protect a greater number of people than does the standard dose and regimen. Earlier this month, we initiated a new smallpox vaccine study that is designed to compare the use of a 1-to–5 dilution or 1-to–10 dilution in undiluted vaccine with the revaccination schedule. This study should

yield information by January, which may help guide us on how to use the remaining stockpile of smallpox vaccine if needed, to protect the general population.

NIAID is also designing other protocols for clinical testing of Dryvax and the newer cell-cultured smallpox vaccines for use in other segments of the population. At the same time, we are looking into alternative vaccine strategies with the goal of designing safer and more effective vaccines.

NIAID is also accelerating efforts to identify antiviral drugs that will be effective in treating smallpox and related viruses. One of these agents is an antiviral called cidofovir, which has shown potential activity against smallpox and related viruses in test tube studies and in animal models. NIH has taken the lead in developing a protocol that would allow the use of cidofovir in emergency situations.

As we have seen in recent weeks, anthrax is another agent that deserves our attention as a bioterrorist threat. Human anthrax has three major clinical forms—cutaneous, inhalation and gastrointestinal. If left untreated, anthrax in all of these forms can lead to septicemia and death. Anthrax vaccine adsorbed [AVA], is the only currently licensed anthrax vaccine and is used solely by the Department of Defense to protect U.S. military personnel in high-threat areas. NIAID has been working with DOD to support the development of the next generation of anthrax vaccines that may be more appropriate than AVA for use in a civilian population.

In collaboration with other government agencies, NIH is working to prioritize and accelerate testing of promising candidates for use as antimicrobial therapies for anthrax in order to increase the pool of available treatments. Novel antitoxins approaches are also under development. An example of this work has just recently been published in the scientific journal, Nature. Much remains to be accomplished, however, and the challenges posed by bioterrorism will require a protracted and sustained commitment.

The NIH will announce in the next few weeks several new initiatives to provide the academic and industrial research community with an opportunity to propose studies targeting new approaches concerning bioterrorism research. The submission, review, and funding of these proposals will be expedited in order to facilitate the rapid advance of these important research endeavors.

With a strong research base, talented investigators throughout the country, and the availability of powerful new research tools, we fully expect that our basic and applied research programs will provide the essential elements that will help enhance our defense against those who attempt to harm us with bioterrorism. Thank you.

Mr. BURTON. Thank you, Dr. Heilman—Heilman.

Ms. HEILMAN. Heilman.

Mr. BURTON. I had it right the first time.

[The prepared statement of Ms. Heilman follows:]

Testimony
Before the Committee on Government Reform
United States House of Representatives

Comprehensive Medical Care for Bioterrorism Exposure - - Are We Making Evidenced Based Decisions?

Statement of
Carole Heilman, Ph.D.
Director, Division of Microbiology and Infectious Diseases, National Institute of Allergy and Infectious Diseases
National Institutes of Health
Department of Health and Human Services

For Release on Delivery
Expected at 1:00 pm

on Wednesday, November 14, 2001

Mr. Chairman and Members of the Committee, thank you for inviting me here today to discuss the medical response to bioterrorism as well as current efforts by the National Institutes of Health (NIH) to accelerate basic and clinical research related to bioterrorism agents.

In just the last two months we have witnessed the deliberate mailing of spores of anthrax bacterium, including the exposure of members of this esteemed body to this deadly bacteria. The recent misuse of microorganisms has shocked the scientific and public health communities, but I can assure you that we are all working tirelessly to advance our nation's ability to respond to bioterrorism and to advance research to address such threats.

Federal health agencies are evaluating and accelerating measures to protect the public from the health consequences of such an attack. Today I will describe one component of this national effort. As part of the NIH, the National Institute of Allergy and Infectious Diseases (NIAID) supports research on the diagnosis, prevention and treatment of infections caused by a wide variety of pathogens, including those that rarely occur in the United States and that have otherwise received relatively little attention. It is important to note that much of our current knowledge about pathogens can be attributed to many years of NIH-supported basic research. NIH-sponsored studies are also yielding key insights into organisms of bioterrorism including agents that cause anthrax, plague, tularemia, botulism, smallpox, and viral hemorrhagic fevers (diseases caused by agents on the Centers for Disease Control and Prevention (CDC) Category A list of bioterrorist agents). I would like to describe our current efforts in pathogen research and plans to increase research in this area.

Our ability to detect and counter bioterrorism depends to a large degree on the state of

biomedical science. Basic and applied research supported by NIH complements the efforts of other agencies by developing the essential tools -- diagnostic tests, therapies and vaccines -- needed by physicians, nurses, epidemiologists and other public health workers to prevent and control a disease outbreak.

To meet the challenges posed by bioterrorism, especially to civilians, NIH supports research in four broad areas: basic research, diagnostics, vaccines and therapeutics.

Basic Research. Research into the basic biology and disease-causing mechanisms of pathogens underpins efforts to develop interventions against agents of bioterrorism. NIH supports research to better understand the factors that influence a pathogen's virulence and invasiveness, as well as those that determine antibiotic resistance. NIH also supports research on the host/pathogen interactions. For example, NIAID and the NIH Office of Dietary Supplements co-sponsored a workshop to draw attention to the scientific gaps in our knowledge of the relationship between micronutrients, such as vitamins and minerals, and infectious diseases. The summary of this workshop can be found in a supplement to the Journal of Infectious Diseases: 182; Sept, 2000. Most recently, NIAID has co-sponsored a targeted solicitation to the research community indicating our interest in further understanding this relationship. In total, knowledge from basic research findings is crucial to the development of preventive and therapeutic strategies.

Another important tool is our ability to rapidly obtain genome sequence information of microbial pathogens, including potential agents of bioterrorism. Some agents, such as smallpox and other orthopoxviruses related to smallpox, have already been sequenced; the sequences of

others, such as *Bacillus anthracis* (the anthrax bacterium), *Enterococcus faecalis,* and *Staphylococcus aureus* and the organisms that cause brucellosis, Q-fever, glanders, cholera, and botulism are in progress. The fruits of genomics research, coupled with other biochemical and microbiological information, are expected to facilitate the achievement of critical new goals, including the discovery of new targets for drugs and vaccines. In particular, comparative genomics (comparing the sequences of different strains of particular organisms) will be an important component of future research, helping us to understand what makes a particular organism either harmful or benign.

In addition to these activities, and as part of our broader research agenda, other Institutes at NIH support research on new and emerging infectious agents, the metabolic effects of toxic agents, hazardous chemicals, and biological mechanisms of action of certain organophosphate chemicals, which mimic the effects of chemically similar nerve agents.

Diagnostics. The overall goal of this research is to establish methods for the rapid, sensitive, and specific identification of natural and bioengineered microbes as well as the determination of the microbe's sensitivity to drug therapy. These scientific advances will allow health care workers to diagnose and treat patients more accurately and quickly.

Vaccines. NIH-supported researchers are developing vaccines effective against many infectious agents, including those considered to be bioterrorism threats (brucellosis, tularemia, Q-fever, dengue, ebola, anthrax, smallpox, and cholera), with the goal of producing products that are safe and effective in civilian populations of varying ages and health status. Vaccines against pathogens are being developed using both traditional and novel technologies. Some novel

technologies include the development of "DNA vaccines" and innovative systems for the rapid creation of vaccines against unfamiliar or genetically altered pathogens; these technologies are in various stages of development. As one example, researchers at the Vaccine Research Center of NIAID have developed a DNA vaccine that has protected monkeys from infection with Ebola virus; this vaccine could soon enter human trials.

Therapeutics. NIH therapeutics research focuses on the development of new antimicrobials and antitoxins, as well as the screening of existing antimicrobial agents to determine whether they have activity against organisms that might be employed by bioterrorists (activities include drug screening of potential treatments for smallpox, plague, and hantavirus). Knowledge gained from basic and applied research is helping to identify additional targets for medications against agents of bioterrorism.

The development of antimicrobial resistance is an important issue with the treatment of most infectious diseases. The design of therapeutic drugs active against known drug-resistant variants of microbes and the development of broad-spectrum agents are important NIH research priorities. For example, NIAID is exploring an opportunity to sequence the genomes of a variety of clinical isolates of *Bacillus anthracis* in order to investigate the potential for antimicrobial resistance in these strains. I have included in Appendix D a copy of the Department of Health and Human Services report entitled "A Public Health Action Plan to Combat Antimicrobial Resistance," which outlines the Department's efforts to address issues of antimicrobial resistance in general.

I have just described NIAID's overall agenda for pathogen research. NIAID-funded

research and a bibliography of published research articles related to vaccines and treatments for the potential agents of bioterrorism requested by this committee are also included in Appendices A and B, respectively. In addition, the current recommendations for medical care for these agents are included in Appendix C.

Now I would like to talk about how this agenda translates to research on two specific pathogens that are of particular concern as bioterrorist threats, smallpox and anthrax.

Prevention and Treatment of Smallpox

Smallpox is considered one of the most dangerous, potential biological weapons because it is easily transmitted from person-to-person, and few people carry full immunity to the virus. The mortality of smallpox infection is approximately 30 percent; those patients who recover frequently have disfiguring scars.

Smallpox vaccine has proven to be highly effective in preventing infection. In addition, the vaccine can lessen the severity of, or even prevent, illness in unvaccinated people exposed to smallpox, if given within a few days after exposure. Based on its effectiveness in prevention and treatment of smallpox, this vaccine was the essential factor in the global eradication of smallpox in 1977. Vaccinations to prevent smallpox have not been required in the United States since 1972.

In the near-term, a bioterrorist attack involving smallpox would require the utilization of stores of the existing smallpox vaccine to protect those at immediate risk. The current stock of DryvaxÒ vaccine, approximately 15 million doses, clearly would not be enough to respond to a

national smallpox epidemic. Last year, NIAID initiated a study to determine the feasibility of expanding the use of the existing stores of the DryvaxÒ vaccine by testing various dilutions. The results of this study showed that the full-strength vaccine had maintained its potency, and that 70 percent of people who received a single dose of a 1:10 dilution of vaccine mounted a sufficient immune response. In the first week of November, a new smallpox vaccine study began that is designed to compare the use of a 1:5 dilution, 1:10 dilution, and undiluted vaccine in order to determine if a diluted vaccine combined with an alternative vaccination schedule could protect a greater number of people than does the standard dose and regimen. This study will provide data that will guide the use of the remaining stockpile of smallpox vaccine if needed to protect the general population.

NIAID plans to support the clinical testing of new smallpox vaccines that may be safely used in other segments of the population. At the same time, we are looking into alternative vaccine strategies, including the development of "DNA vaccines" and other innovative systems, with the goal of designing safer and more effective vaccines.

NIAID is also accelerating efforts to identify antiviral drugs that will be effective in treating smallpox and related viruses. One of these agents is an antiviral called cidofovir, which is approved by the Food and Drug Administration (FDA) for treating certain AIDS-related viral infections. Cidofovir has shown potent activity against smallpox and related viruses in test tube studies and in animal models. NIH has taken the lead in developing a protocol that would allow cidofovir to be used in emergency situations for the treatment of smallpox.

Other anti-smallpox agents are also being investigated. For the past three years, NIAID

and the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) have screened approximately 500 compounds for potential antiviral activity against smallpox.

Prevention and Treatment of Anthrax

Several characteristics of *Bacillus anthracis*, the agent that causes anthrax, help to establish it as a formidable bioterrorist threat, including its stability in spore form, its ease of culture, and the absence of natural immunity in industrialized nations.

Human anthrax has three major clinical forms: cutaneous, inhalation, and gastrointestinal. If left untreated, anthrax in all forms can lead to septicemia and death. Early treatment of cutaneous and gastrointestinal anthrax with appropriate antibiotics is usually curative, and early antibiotic treatment of all forms is important for recovery. Although case-fatality estimates for inhalational anthrax are based on incomplete information, the historical rate is extremely high, approximately 75%, even with all possible supportive care including appropriate antibiotics.

Anthrax vaccine adsorbed (AVA) is the only currently licensed anthrax vaccine. At this time, AVA is recommended only for high-risk populations such as veterinarians. The Department of Defense (DOD) also uses this vaccine to protect U.S. military personnel in high-threat areas. The current schedule for receiving vaccine, 6 doses over the course of 18 months, is cumbersome and efforts are underway to identify a simpler immunization schedule.

Assuring the safety of the very young, the aged, and immunocompromised individuals requires a different approach to drug therapy and vaccine prevention than would be applicable in a military population. NIAID has been working with DOD to support the development of the

next generation of anthrax vaccines that may be more appropriate than AVA for use in the civilian population. NIAID is also exploring rapid diagnosis of anthrax and the utility of alternative antimicrobial or antitoxin therapies. Together with the Food and Drug Administration (FDA), CDC, and USAMRIID, NIH is working to prioritize and accelerate testing of promising candidates for use as antimicrobial therapies for anthrax in order to increase the pool of available treatments. NIAID-supported investigators have recently published two studies in the scientific journal *Nature* that help to explain how anthrax toxin destroys cells. In the first study, researchers have identified the site on the cell that binds the anthrax toxin and have developed a compound that may disable it. Another group of investigators has characterized the structure of a major component of the anthrax toxin. The information gained through these studies will likely hasten the development of new drugs to treat anthrax.

Together with our many research partners, NIH has made substantial progress in the research effort that is critical to our Nation's fight against terrorism. In addition to previously mentioned collaborations with other government agencies, NIAID maintains important partnerships with industry that are essential to the development of new technologies and treatments in the infectious diseases arena.

Much remains to be accomplished, however, and the challenges posed by bioterrorism will require a protracted and sustained commitment. NIH will announce in the next few weeks several new initiatives to provide the academic and industrial research communities with an opportunity to propose studies targeting new approaches to research on agents of bioterrorism.

The submission, review, and funding of these proposals will be expedited in order to facilitate the rapid advance of these important research endeavors.

With a strong research base, talented investigators throughout the country, and the availability of powerful new research tools, we fully expect that our basic and applied research programs will provide the essential elements that will help enhance our defenses against those who attempt to harm us with bioterrorism.

That concludes my testimony. I would be happy to respond to any questions you might have.

Mr. BURTON. Before we go to Dr. Meyerhoff, Ben Gilman, the chairman emeritus of the International Realtions Committee, has a brief statement he'd like to make.

Mr. GILMAN. Well, thank you very much, Mr. Chairman. I regret I'm being pulled away to another hearing, but I want to thank you and the committee for conducting these extensive hearings on bioterrorism; and our committee has been one of the leading committees in doing the oversight on what our Nation is prepared to do to take care of the problem. The September 11th attacks in New York, Pennsylvania and Virginia and the subsequent breakouts of anthrax around the country raised the issue of bioterrorism to a high level.

With regards to vaccines and remedies against various biological agents such as smallpox and cholera, there's a tremendous amount of medical information that we already know, but there's still a great deal more that we should know and that we should be doing. The American public has been inundated with information about anthrax and smallpox, some of it accurate, some not so accurate. Doctors and pharmacists are having to learn about these illnesses as they present themselves, as the margin for error or a misdiagnosis is so great.

The American public needs to know that their health professionals are prepared to handle a biological crisis, and I want to thank you for bringing these expert witnesses before us, and we're eager to learn how the defense and medical communities are prepared for any attack of this nature, what we've learned from the most recent attacks and what still needs to be done to further prepare us accordingly.

Mr. Chairman, again I thank you for arranging these hearings. I regret I'm going to have to run to another hearing, and I'll try to return as quickly as possible. Thank you, Mr. Chairman.

Mr. BURTON. Thank you, Mr. Gilman.

And now we'll hear from Dr. Meyerhoff.

Dr. MEYERHOFF. Thank you. I am here to answer questions, and I am joined by Dr. William Eagan, also from FDA.

Mr. BURTON. OK. So you're prepared to answer questions, but you don't have a statement?

Dr. MEYERHOFF. That's right.

Mr. BURTON. OK. Fine. Let me start off with General Parker.

In your written testimony, you reference that the Department uses passive and active countermeasures to protect our troops, and you mentioned pretreatments, therapies, timely detectors and effective protective equipment. During our previous committee hearings we had last year, we learned that DOD had to recall most of their protective gear and masks. Has all this gear been replaced?

General PARKER. Mr. Chairman, respectfully, I'd asked to come back to the answer with that question.

Mr. BURTON. OK.

General PARKER. I am not in that part of the world to acquire garments and masks, but I will answer that question off the record.

Mr. BURTON. OK. If you could have somebody get that back.

General PARKER. I will.

Mr. BURTON. OK. We know there are numerous potential biological terrorist agents—anthrax, smallpox, Q-fever, tularemia, Ricin,

cholera and plague. In your written testimony, you mention that we only have licensed vaccines for one biological agent, that being anthrax. However, the medical NBC battle book, which we have here, which is given to medical personnel states that 14 possible biological agents have vaccines, including anthrax, cholera, plague, tularemia, typhoid fever, Q-fever, botulism, toxin and smallpox. It also states that seven other agents have vaccines in development.

Are all these vaccines that are mentioned in the battle book licensed vaccines; and if not, what specific measures are taken to advise members of the military about their participation in human subject research?

General PARKER. Sir, the vaccines mentioned other than the anthrax vaccine have not been licensed. They fall into the category of investigational new drugs, which means that if you take that vaccine, it has to be under a protocol with a principal investigator leading that protocol and informed consent is used, of the individual.

Now, we use a lot of those vaccines in our research program because our researchers and scientists who are dealing with those pathogens like tularemia, plague, Rift Valley fever, a lot of the things that you mentioned, have to be protected in their laboratory from the agent. And we give them the investigational new drug vaccine and follow them in our special immunization program, but they are not fully licensed with the FDA for use on the public.

Mr. BURTON. Well, these vaccines are mentioned in this book. If they're not ready for use by the military, why are they mentioned?

General PARKER. They're mentioned, sir, because in a contingency or a crisis, we could invoke the protocol for those who were infected or threatened to be infected by those agents and make them part of the research group of the investigational new drug. And in that particular case, we would have to go to each individual and explain what their situation was and that this drug was available and here's all the things that we know about that drug or vaccine, but it is not licensed; and you would have to be essentially a subject to a research experiment.

Mr. BURTON. In a few minutes, you're going to hear from Dr. Wayne Jonas, a retired Army doctor who conducted research in an Army laboratory and published and peer reviewed a scientific journal showing that homeopathy could be utilized with tularemia.

What have you done at Fort Detrick to capitalize on this research?

General PARKER. Mr. Chairman, I would say that we probably have done nothing to capitalize on that research, except to know about it.

Mr. BURTON. Well, if there is a disease that the military might be faced with and there was a published journal or paper showing that some product was helpful or had a cure rate, why wouldn't they check into that?

General PARKER. Mr. Chairman, we pursue the use of fully licensed or fully approved drugs under the Food and Drug Administration for the use of our forces, to use on our forces. And so for that particular reason, I would say to you that we use the Food and Drug Administration as our regulating and licensing agency, and if a product isn't in some queue with the Food and Drug Adminis-

tration, either under an investigational new drug protocol or licensed, we don't anticipate using that on the service members in the Department of Defense.

Mr. BURTON. Homeopathy is fully licensed and regulated by the FDA, and I guess I'm a little at a loss here. If this paper has been published in peer-reviewed scientific journals and it shows that this could be helpful in this particular situation, I don't understand why the military hasn't looked at that.

You have to wait till the FDA gives its approval on that; is that correct?

General PARKER. That's correct, Mr. Chairman.

Mr. BURTON. Dr. Meyerhoff, could you respond to that?

Dr. MEYERHOFF. Generally, the sponsor of a product would come to us and ask us to review the safety and efficacy data of a particular product. We're not currently aware of any particular homeopathic remedy for tularemia, but we would certainly be willing to review that information if it were brought to our attention.

Mr. BURTON. Well, when something is published in a peer-reviewed journal, scientific journal, you don't review that and then take action on it? You wait until somebody submits it to you?

Dr. MEYERHOFF. Generally that's the way that proceeds.

Mr. BURTON. That's surprising. I just don't understand why, if it looks like there's something that's very promising and has some very beneficial effect, why wouldn't the FDA go ahead and take the initiative to check that out, especially if it's published in a scientific journal?

Dr. MEYERHOFF. Generally, a product is brought to our attention by a sponsor—an individual or an organization or a business—that is intending to manufacture or use the product; and it's at that point that those data are presented to us, and that's when we review them.

Mr. BURTON. Do you have many homeopathic, or remedies like that, that are brought to you, other than, say, it's things that are brought to you by pharmaceutical companies?

Dr. MEYERHOFF. I'm not aware of any.

Mr. BURTON. So unless it's brought to you by a pharmaceutical company, you normally don't take action on it?

Dr. MEYERHOFF. No. A product could be sponsored by any number of potential organizations or individuals, academic investigators, other government agencies or a pharmaceutical company.

Mr. BURTON. But, in fact, you don't know of any that have been sponsored, other than by pharmaceutical companies?

Dr. MEYERHOFF. Perhaps I misunderstood your question. I'm not aware of any homeopathic remedies for that——

Mr. BURTON. That have been licensed by you?

Dr. MEYERHOFF. That's correct.

Mr. BURTON. So unless it was submitted by a pharmaceutical company, you probably wouldn't have taken any action on it?

Dr. MEYERHOFF. A pharmaceutical company or an academic investigator or——

Mr. BURTON. Well, has there been any academic investigations on homeopathic remedies that have been brought to you?

Dr. MEYERHOFF. No. I'm not aware of any.

Mr. BURTON. Oh, OK.

Do you have any questions? Mr. Kucinich.

Mr. KUCINICH. First of all, I want to thank the Chair for his ongoing interest in trying to advance the cause of humanity by making sure that people are aware of emerging practices in health care and making people aware of broader choices in health care and offering the possibility of increasing public awareness of other than allopathic practices.

I think the chairman did you a service, and I want to congratulate him for that. I'd also like to continue to pursue the line of questioning, perhaps with Dr. Meyerhoff.

Is it of interest to the FDA or to you that there may be alternative or complementary approaches to medicine that may provide relief under certain circumstances to people who are affected by a wide range of diseases, some of which might be connected to a biological event?

Dr. MEYERHOFF. Yes, it is, and we would be very willing to look at those data.

Mr. KUCINICH. You just haven't done it yet, because the question hasn't really arisen. Is that——

Dr. MEYERHOFF. That's correct.

Mr. KUCINICH. But you're not averse to considering the possibilities of alternative medicine to deal with any particular health crisis that would confront the American people?

Dr. MEYERHOFF. That's true. We would be happy to review any data that's presented to us for either safety or efficacy.

Mr. KUCINICH. Now, your role is just—you've mentioned it several times—happy to review any data. Do you ever initiate any study or initiate any action in a search for alternatives, or are you pretty much bound by medicine as it's described by allopathic practitioners and pharmaceutical companies?

Dr. MEYERHOFF. As a regulatory agency, there is a limit to how much we can get involved in the actual development of a product, and generally the process is that the developer comes to us and presents the data so that we can review it. There is a potential for conflict of interest if we go out and participate in the development.

Mr. KUCINICH. I understand that, but aside—you know, if we're talking product, we're talking pharmaceuticals. What about a practice as opposed to a product? What about an approach to medicine itself that—apart from a particular product, I'm asking you. I mean, what's your view of that?

Dr. MEYERHOFF. I'm sorry. Could you repeat the question? I'm having a little trouble hearing you.

Mr. KUCINICH. What I'm asking is, when you speak of a product, you're speaking, I suppose, of pharmaceuticals. And I understand that the FDA has to, through the procedure of clinical trials, keep a distance from something until it proves itself.

Now, as the chairman pointed out, there are many peer-reviewed articles which derive from complementary and alternative practices. Does the FDA do anything to publicize, encourage, bring forward, let the public know or anything like that to let people know they have other choices; or are you pretty much bound by what we would know as conventional medicine?

I'm trying to find out about your scope here.

Dr. MEYERHOFF. OK. We're focused on the approval of products, whatever those products might be. Certainly when we're looking at some of these more unusual diseases that are presented to us by bioterrorism threats, we maintain an open-minded stance about what might be appropriate remedies for them.

Mr. KUCINICH. Thank you, Doctor.

If I could ask, before I'm finished here—Dr. Straus, I looked at your testimony carefully, which takes in a way a common-sense approach saying, look, if we're in a bioterrorism incident, we certainly want to use time-tested measures to treat the general public; and I think most of us would agree with that.

As the Director of the National Center for Complementary and Alternative Medicine, are you prepared to bring forward alternatives which may provide for efficient treatment of some of the bioterrorist episodes we may have that may even be less expensive, let's say, than the pharmaceuticals which are currently being prescribed? Do such, to your knowledge, products exist, or are you—is it simply your position that there really are no other alternatives than what we have conventionally?

Dr. STRAUS. Mr. Kucinich, NCCAM solicits and funds meritorious research applications in a very wide range of areas. We are specifically looking for complementary and alternative approaches to neurological disorders, to cancer, to arthritis, mental health conditions and infectious diseases. We are funding studies related to HIV/AIDS, respiratory infections, influenza, hepatitis and several others. And we would be happy to receive and consider applications that come through the new initiatives that Dr. Heilman indicated from the NIH or through any other mechanism as a priority.

We have had no such applications, and in the absence of what I would consider to be fairly good evidence that something is safe and effective and does not interfere with other safe and effective therapies, I would be loathe to deploy them.

I do think that bioterror-weapon infections are a special case because of their rapidity of action, their virulence and their spread; and I think we must be more cautious with issues of public health in this setting than for many other disorders in which complementary and alternative medicines may have far more to offer—disorders of a more chronic nature, where the capacity to retain people's dignity and comfort, to reduce pain, to improve their nutritional status, to fight off opportunistic infections and things like that—all make a great deal of sense.

Mr. KUCINICH. Well, Mr. Chairman, I want to thank you, and I just want to address the Chair in saying that, you know, we hear reports that if we were to be subject, God forbid, to one kind of biological terrorism or another, that perhaps the vaccines may not be available, you know, in quantity, all right; and I would think that it might be helpful for the National Center for Complementary and Alternative Medicine to have plan B ready, plan A being unwavering trust, "in the currently approved drugs and vaccines;" plan B, alternative and complementary medical approaches that in an emergency might help save lives. And I think that's the spirit in which the Chair proceeds here.

And I thank you, Mr. Chairman. I thank the gentleman.

Mr. BURTON. Thank you, Mr. Kucinich.

Mrs. Morella.

Mrs. MORELLA. Thank you. Thank you, Mr. Chairman. I ask unanimous consent that my opening statement be included in the record.

Mr. BURTON. Without objection.

Mrs. MORELLA. I appreciate your calling this hearing and the series of hearings that you've been very interested in, and that has helped us all. It has become clear to us all that while the threat of bioterrorism is significant, it can be overcome with knowledge, good planning. We need a coordinated civil defense, a robust, prepared public health system and further development and research into current and future therapies. We need to integrate our hospital, our response system, increase our stockpiles of medicines and vaccines and recruit and train more first responders.

So today's hearing is pointing out to us medicinal treatments that are most effective and what new ones should be developed.

[The prepared statement of Hon. Constance A. Morella follows:]

Morella Remarks

I want to thank Chairman Burton and Ranking member Waxman for holding this hearing today. The recent anthrax cases here in Washington and in New York and Florida have shown us that we need to be prepared for anything. We have also come to realize that we need to know much more information. Clearly our response here in Congress and in the District demonstrated that we were not completely aware of how particular agents behave and the number of people that are vulnerable. But we also learned that an immediate response with the correct treatment can sometimes save those who have contracted the most dangerous form of certain agents.

It has become clear to us all that while the threat of bioterrorism is significant, it can be overcome through knowledge and preparation. We need a coordinated civil defense, a robust and prepared public health system, and further development and research into current and future therapies. We need to integrate our hospital response system, increase our stockpiles of medicines and vaccines, and recruit and train more first responders. Hopefully, today's hearing will also highlight what medicinal treatments are most effective and what new treatments should be developed.

I look foward to the testimony today and I yield back the balance of my time.

Mrs. MORELLA. My first question is to Dr. Meyerhoff. Two weeks ago, Dr. Frank Young, remember him, he was an FDA Administrator? He testified in front of the Science Committee, of which I am also a member, and he mentioned some so-called "urgent recommendations." One of these recommendations was for Congress to finalize the proposed FDA regulations whereby new drug and biological products used to reduce or prevent toxicity from chemical, biological and nuclear substances could be approved, even though the traditional efficacy studies in humans are not feasible and cannot be ethically conducted under FDA's regulations for adequate and well-controlled studies in humans.

I would agree with the agency that this is necessary to protect, or treat individuals that are exposed to lethal or permanently disabling toxic substances, even when human studies have not and cannot be performed. But presently, are there treatments available that would help someone affected by a chemical or biological agent that could not be used because of the present regulations? Is this regulation familiar to you?

Dr. MEYERHOFF. Yes, it is. If I understand your question, you are asking if there are current remedies available that are not permissible to use because——

Mrs. MORELLA. In other words, is that recommendation valid in its premise, as well as then I'm going to ask you if you think that Congress should be moving on this.

Dr. MEYERHOFF. OK. That regulation is designed to facilitate the development of the products that you describe, for rare diseases and diseases that can't ethically be studied in humans. There are a number of products available for use in humans who have been exposed to a biological or a chemical or a nuclear agent. Some of them are proved. Some of them would be available under the IND, or Investigational New Drug, regulations. Right now I can't think off the top of my head of anything that is not usable because the animal efficacy rule is not finalized.

Mrs. MORELLA. If Congress did not finalize these regulations, would it seriously hamper our ability to provide treatment to those who suffer from a chemical or biological or nuclear agent?

Dr. MEYERHOFF. Well, the use of an animal model to demonstrate drug or vaccine efficacy is certainly a critical piece of the development of these types of products that can't be studied in humans for the efficacy piece of their development.

Mrs. MORELLA. Would any of the other members of the panel like to comment on that? Do you have any problems with that idea, General?

General PARKER. Yes, I would. The support and the passage of a good surrogate model rule for the FDA is critical in these weapons of mass destruction, because it would be unethical to expose human beings to any of these agents that we call the threats, because of the severe effects they have on a human being. Bioethics wouldn't even allow us to approach an individual and ask them for informed consent because of the voracity of these diseases and the potential to kill.

So I support the FDA in exploring a way to license drugs through a surrogate model, and I think they're trying to do that very carefully and in a correct way, but we all want it yesterday.

Mrs. MORELLA. Right. Did anyone else want to comment on it? I guess not.

Dr. Young also discussed the need for just-in-time immune therapies to treat potential threat agents. Does anyone have any comments on that? Dr. Meyerhoff.

Dr. MEYERHOFF. I'm not sure I'm familiar with the type of agent you're referring to. Could you give a little bit more information on it?

Mrs. MORELLA. Well, it would be the—I guess those therapies that you would just—as you see the incident occur, that you would be using it at that time so it hasn't gone through the whole approval process. I will get you more information on that. I can get you part of the testimony that he presented. It might be very helpful for us to have you look at some of his recommendations.

Dr. MEYERHOFF. OK.

Mrs. MORELLA. From your experience point of view. He hasn't called me on time yet.

General Parker, it's my understanding that there aren't nearly enough field hospitals that can be used in the case of mass casualty management within the DOD. DOD, I understand, has only five such units, and the equipment is lacking to meet the civilian need. Are you aware of anything that's being done to address this situation, sir?

General PARKER. You spoke to a field hospital? I think you said field hospital.

Mrs. MORELLA. Yes.

General PARKER. The Secretary of Defense has quite a bit of capability from the standpoint of hospitals that are built by the Services, Army, Navy and Air Force and the Marine Corps, and he has stated publicly that the Department of Defense stands by to support the homeland security and homeland defense with all of the Defense Department's capabilities. I would say that the capability to field combat support hospitals, field surgical teams, ambulatory medical units is quite robust, and stands by to support local government and State government and Federal Government in the event of need.

Mrs. MORELLA. So your answer is that you don't have any concern that these needs would be addressed?

General PARKER. I don't have any concern. If the Federal Government or an agency turned to the Secretary of Defense and said we need help, I'm sure he would leverage his capability. Considering we have a campaign going on right now——

Mrs. MORELLA. Yes.

General PARKER [continuing]. I'd think he'd want to hold a little in reserves so we wouldn't have any service members in jeopardy as they fight the Nation's wars and work on this campaign, but he would also have residual capability to help the Nation.

Mrs. MORELLA. I think your trust is probably well founded. Thank you.

Thank you, Mr. Chairman.

Mr. BURTON. Thank you, Mrs. Morella.

You know, General, in previous hearings that we've had, DOD experts have testified that we had to vaccinate with the current anthrax vaccine because if there was an exposure to anthrax spores,

the military wouldn't be able to or shouldn't be giving all of the troops battlefield antibiotics, because it will leave them unable to fight. What would be the side effects of battlefield antibiotics in lieu of giving them preventative anthrax vaccines?

General PARKER. Well, sir, if they were immunized via vaccine, we wouldn't have to have a daily regimen of giving an antibiotic——

Mr. BURTON. Well, right now the Bioport Co. is not delivering the vaccine, because there's been a number of problems, as you know, and the complete regimen of vaccines has not been given to all the military. Some of them have received it and some of them have not. Let's say we had a battlefield situation where anthrax was sprayed by an airplane over a whole battlefield contingency and they had not been vaccinated, or if they had been vaccinated they hadn't received the complete regimen of the vaccinations. What would be the problem with giving them the antibiotics to fight that?

General PARKER. None, sir, and we would do that, because they were threatened, and we'd have credible evidence that they were exposed. We would in fact treat them as exposed at this present time.

Mr. BURTON. What would that do to the fighting force? What kind of incapacity would be involved?

General PARKER. Well, sir, you eloquently stated the side effects in your opening statement of a drug like Ciprofloxacin.

Mr. BURTON. Right.

General PARKER. I don't know how many people in this room have taken an antibiotic for any length of time, but just the compliance of taking something every day is one aspect of that. The second thing is, it doesn't make you feel good on a day-to-day basis. You're taking an antibiotic, and it has an effect on the system. Now, all the people don't respond the same way. I mean, maybe 80 percent of the people could probably take this and they wouldn't have a problem at all, but 20 percent would probably have a problem, and it would be serious enough that it would worry them and they wouldn't be at full capacity to fight our Nation's wars.

Mr. BURTON. Now, the side effects of the anthrax vaccine that have been pretty severe in a number of cases, you think that's a fair tradeoff, though, rather than going with the antibiotics in the event of exposure?

General PARKER. Mr. Chairman, I personally feel that that's a good tradeoff, compared to the risk of contracting anthrax or the pulmonary anthrax——

Mr. BURTON. No. I understand that, but I mean the vaccination of—you think would be preferable to giving battlefield antibiotics in the event of an exposure?

General PARKER. Mr. Chairman, I do.

Mr. BURTON. Dr. Straus, do you think there are complementary therapies that can improve a person's immune response and if so, can you give us examples of those?

Dr. STRAUS. There are complementary therapies that are said to improve people's immune responses and there have been laboratory assays showing changes in lymphocyte and other kinds of white cell responses to animals or people who have been placed on some of those. Echinacea is a common herb in which that is stated to be

the case. What we don't know is whether the changes that had been measured in the clinical studies or in the laboratory models are of such a nature as to be clinically meaningful, and for that reason we are currently funding large prospective studies of echinacea for volunteers being challenged with respiratory virus infections and people who casually acquire these infections to see whether it would make a difference in the course of the illness. An important belief, among those who use complementary medicine, is that echinacea boosts immunity. Our responsibility, one that we're taking seriously, is to find out whether that's true and whether it's to a meaningful extent.

Mr. BURTON. And how long does a study like that take?

Dr. STRAUS. It depends on the studies. Most of them take at least 2 years.

Mr. BURTON. Now, is that the only one that you know of that's being studied right now, or are there others?

Dr. STRAUS. There are other approaches that are said to affect the immune system, various mind and body techniques, relaxation and meditation techniques.

Mr. BURTON. I know, but other things that you can—dietary supplements that can be taken that might help, like zinc or Vitamin C or those sort of things? Have there been studies on those?

Dr. STRAUS. There have been studies of zinc and Vitamin C. There have been conflicting studies of outcomes in colds, as well as studies of immunologic effects of zinc. Some have been positive. Some have been negative. There have been many more studies of Vitamin C in the aggregate. There's no good evidence that Vitamin C boosts one's measurable immune response, and its effect on colds themselves is in the aggregate a very small one. Of all the studies combined, Vitamin C is said to have perhaps a 9 or 10 percent difference in rate of resolution of a cold, though we don't know whether that's because of a biochemical effect or whether it's working through the immune system, per se.

Mr. BURTON. You know, I talked to Dr. Linus Pauling before he died, who won two Nobel prizes, one for scientific research, and he was convinced that Vitamin C had tremendous positive effects on a whole host of things, and his research he said had shown that. Have you ever looked at any of his documents?

Dr. STRAUS. Of course. When I was a medical student, I read his book, Vitamin C and the Common Cold. I've read many of the papers that he's published in the field. I've reviewed the literature on Vitamin C and the cold. There have been many——

Mr. BURTON. I'm not just talking about the——

Dr. STRAUS [continuing]. Large studies. In addition, there are studies suggesting that Vitamin C and other antioxidants, nutritional supplements, might be beneficial in cancer. Small studies with oral Vitamin C have not been successful. There are some data suggesting that if it is given intravenously one may be able to achieve cellular levels that cannot be achieved with oral supplements. For that reason, we're working with the National Cancer Institute to plan a workshop at this time on antioxidants, including Vitamin C, as adjunctive approaches to the treatment of cancer.

Mr. BURTON. Now, when would that start? I'm just curious, because cancer is pretty prevalent in our society, you know.

Dr. STRAUS. Yes, of course. There was a preliminary planning workshop. Authorities came together this past summer. I believe the workshop is planned for later this fiscal year.

Mr. BURTON. What is NCCAM doing to look at homeopathic remedies and natural substances for infectious diseases?

Dr. STRAUS. Mr. Chairman, as I mentioned earlier, we are funding several studies related to dietary approaches, mind/body approaches and the like for HIV/AIDS, for influenza, respiratory infections of various kinds and for various forms of chronic hepatitis B and C infections.

Mr. BURTON. In your written testimony, you appear to discount that any complementary therapy would prove useful for bioterrorism agents. In the cases of things like dengue fever and tularemia, don't they offer viable options that should be considered?

Dr. STRAUS. Well, there are differences between dengue fever, which is a fatal disease in unusual circumstances when people have been reinfected by other dengue types. There is an epidemic in Hawaii right now.

Mr. BURTON. Right.

Dr. STRAUS. And most people really recover quite well from dengue. Tularemia is a more virulent and explosive infection for which there are very good antibiotics that are quite effective. I fully support the notion of exploring any option from any background, doing so in the context of good science, and I would argue that before I would wish to displace an antibiotic treatment for tularemia, I would like to see serial animal model studies suggesting that the therapy is active.

Mr. BURTON. Well, we understand the antibiotics are effective, but one of the concerns that we have in some of these other diseases is that you might have a huge run on antibiotics in a given area and they may not be ready available. Now, hopefully they would be, and in that particular case, is it not logical to look at alternatives in the event that should occur?

Dr. STRAUS. I think it would be logical to determine whether alternative medicines would provide adequate clinical preventative and therapeutic effect. If our national response was such that we could not deliver enough antibiotics, it would be problematic to give some of our populace therapies which are untested and unproven and let others have the tested and proven therapies.

Mr. BURTON. No. I understand, but if there are therapies, homeopathic remedies and so forth, that have had success or there's alleged successes, why are those not being looked into as an adjunct to antibiotics in the event that that would occur?

Dr. STRAUS. Right. I would have no problem funding studies of homeopathic regimens. Dr. Jonas is here and is far more an expert in homeopathy than I am, but if he or someone else wished to investigate the small studies suggesting a 20 percent overall improvement with homeopathy as compared with 100 percent improvement with the tularemia vaccine, that certainly could be addressed. NCCAM has no reluctance to receive or fund studies that are well-designed and can answer the question in a way that will benefit American public health.

Mr. BURTON. You know, in a number of other countries, there have been therapies that have been used in the past for centuries

that have been believed to have been very, very effective in dealing with a number of diseases and problems, in China and India in particular. Has your organization done much to collect the existing data from countries like India and China and conduct trials on some of those things that they have used these remedies for?

Dr. STRAUS. Yes, Mr. Chairman. This is a small planet today, and the American melting pot has brought experts in these therapies to our shores. We have many investigators who are exploring Ayurvedic and traditional Chinese approaches to many diseases. In addition, we've reached out abroad. This very day we are holding a workshop with the National University in Singapore in which we've invited investigators throughout Asia to come together and talk about opportunities for research funding through the NIH. In addition, I have met personally with the Minister of Traditional Medicine of India, and we have been planning with them a workshop in India to bring American investigators to India to meet with investigators and practitioners of Ayurvedic medicine to discuss research opportunities.

We have had some such investigators here, and we have discussed, in collaboration with the National Cancer Institute, funding a study of a homeopathic approach to cancer in Calcutta.

Mr. BURTON. Mrs. Morella, do you have more questions?

Mrs. MORELLA. Oh, thank you. I do. This could be directed to any of you on the panel. I know that developing medical countermeasures to disease historically has been a very long process. The estimate is it's taken anywhere from 12 to 14 years. Today recombinant DNA techniques and other biotechnologies are reducing the total development time and allowing improvement of existing vaccines, treatments and diagnostic methods. My question is how significantly has the development time been reduced, and are there any more biotechnologies on the horizon that would further reduce the time needed to produce these countermeasures? Are there any vaccines or treatments that might be available soon?

Ms. HEILMAN. I'd like to answer that. You are correct in that there are a number of approaches that are new that would allow for, for example, insertion of genes into a platform, and so the possibility of having a compendium of genes that you can simply insert in when you do have a problem is a reality.

The problem that we do face is getting from that stage into the next stage, and that's getting products that have been approved for use in humans and then getting the information about how these products actually work in humans. Those steps are still long steps that one needs to take in order to assure, before you can even use the product under an investigational new drug status, that it actually has some potential value. So although the time on basic research is cut short, there is a long road that needs to be taken in order to be able to use the products in humans.

Mrs. MORELLA. I might jump into a followup question and allow anyone else who wants to comment. The development process is guided, as you are suggesting, by a whole series of reviews, scientific, clinical, regulatory, to assure the product's safety and efficacy, and all of the research at USAMRIID is performed in full compliance with Federal guidelines and regulations, including FDA, NIH, the Centers for Disease Control and Prevention, the De-

partment of Agriculture, the Nuclear Regulatory Commission, the Environmental Protection Agency, the Occupational Health and Safety Administration.

Does this process significantly slow product development? And it sounds like it probably would. And if you agree, is there anything that we can do to further coordinate compliance? For instance, has the Office of Homeland Security looked into the process at this point?

Anyone want to comment about the process and what could be done for better coordination if you feel it's necessary? Dr. Meyerhoff.

Dr. MEYERHOFF. There are certain points in the product development process where as a regulatory agency FDA seeks to streamline or make more efficient that process, and some of the points I would cite would include very early dialog with developers at the period that we would call the pre-IND phase; that is, as the developers, thinking about moving into human trials, we encourage them to come to us for regulatory guidance that often can streamline the process.

As the development process goes on, there are points later on where products can be made available under what we would call a treatment IND or an emergency IND. That is prior to the formal approval, but if there is a certain amount of data or a certain body of data that has been developed that suggests safety and some efficacy, products can be made available that way.

Later on when a formal application is made for marketing approval and comes to us for review, there are a number of ways that can be expedited, such as the accelerated approval process. There are ways that developers can present their work to us in what we call a rolling fashion, where as it's ready, it goes to FDA and we review it as a rolling submission. When a product is demonstrated to have a particular public health need, we can commit to an expedited review clock, where we will perform the review and render a decision more quickly than we normally would on the standard review clock.

So there are a number of points in the development process, where as the regulatory agency, FDA would seek to streamline that process and make it more efficient.

Mrs. MORELLA. Anyone else want to comment on it? Dr. Straus?

Dr. STRAUS. Mrs. Morella, I'm not a regulator, but I've been a clinical investigator for 22 years. We have an extraordinary series of tensions that play upon us. We have not only the usual high responsibility of not harming our patients that we have as physicians in general, but we have the added burden of not imposing additional harm to people who are not sick in the conduct of research. This august body has held hearings in recent years about potential risks of doing research, and here we are challenged at a time of a great national emergency to respond, but yet our responsibilities to each individual person who would be a research subject remains the same. It's hard to overlook that responsibility.

Mrs. MORELLA. That was a very good answer. So it sounds like you're trying to say, you can expedite when necessary, but you haven't really approached the fact that there may still be a cum-

bersome process that could well be coordinated. At least I've always felt that way.

Thank you very much. Thank you, Mr. Chairman.

Mr. BURTON. Thank you, Mrs. Morella.

Ms. Watson, do you have any questions?

Thank you.

Let me just say that Tommy Thompson, the head of HHS, has indicated that we would have something like 12 million vaccinations for smallpox. Is that correct? I think that's correct, isn't it, 12 million?

Ms. HEILMAN. It's actually 15 million.

Mr. BURTON. 15 million. We have 240 some million people in America right now. If we had a massive outbreak of smallpox through a terrorist attack of some kind and it was spreading, that might not be sufficient.

Have we looked at any other approaches for the population that would not be vaccinated to deal with that tragedy so they would not come down with smallpox other than to get it and just die?

Ms. HEILMAN. I think the only other approach that we have taken seriously is to look at potential antivirals. We have screened about 500 potential candidates in an animal model system to try to identify classes of compounds that may be very valuable in actually treating smallpox even after you have just gotten it. One of them is cidofovir, which I mentioned before, and although it is delivered by the IV route, and so it is a very cumbersome as well as toxic drug, that we have actually put in a treatment IND to the FDA so that if we were in that horrible situation, we would have at least another option to consider, and that is treating people with cidofovir.

Mr. BURTON. But you don't know of any alternative or homeopathic therapy that would be helpful in dealing with that?

Dr. STRAUS. There is a homeopathic regimen that has been marketed on the Internet recently that's of uncertain initial origin that has such claims, but the experts in homeopathy and the American Association of Homeopathic Pharmacists and the National Center of Homeopathy have declared recently in their own literature and Web sites that they don't believe there is any cogent data to suggest that the material works. I do believe it is possible that there are materials out there in our natural kingdom that may have activity inhibiting the replication of the variola virus. They haven't been found, and such compounds have been screened.

It is true that many products that are drugs that we use today originated in plants, and people identify those activities, purify their substance and prove them to be effective. One of the recent examples is that of artemisinin, which has been extracted from and synthesized and chemically modified as a treatment for malaria. It was used for many centuries in Southeast Asia for treatment of chronic and recurring fevers without knowing of malaria as a specific disease.

I am not aware in the literature whether there are natural products that people have felt to be very effective against smallpox. History is writ large with the scourge that it represents having dessimated populations in regions in the world that have developed some of the most robust empirical approaches to health care, such

as India and China I would say that we as a Nation would be challenged by a mass epidemic of smallpox, and it's not yet clear whether there are products to meet it other than through the existing vaccines and kinds of new drugs that NIAID-funded investigators and industry are looking at. I would have no difficulty taking leads from practitioners of nominating products to put into the screens to see whether some of these were effective in mouse models of smallpox. There would be no problem doing that in the priority list of products that need to be screened that make the most sense.

Mr. BURTON. I appreciate that, and I think that's an open-minded approach to it. The problem is, we are facing a terrorist threat now, and it could happen at any time. We don't know. We know that the threat exists, and we know how lethal it can be. So I guess the question is there have been some claims made, I think, by homeopathic entities. None of those that have been claimed are being checked by our health agencies right now as to the veracity of those claims.

Dr. STRAUS. I am not aware of any such activities.

Mr. BURTON. So the bottom line is if we had a smallpox epidemic right now, we would be able to take care of approximately 15 million people. And maybe some of the people who are vaccinated previously might have some residual immunity because—like me, I had one when I was a child, so I probably would have some immunity possibly. But by and large, we would have a terrible loss of life.

Ms. HEILMAN. Could I just clarify, because we are indeed doing a dilution study, and our first attempt at looking at the dilution study at the current vaccine showed that if we diluted it 1 to 10, we got a 70 percent take rate of the general population. These are people who actually have not been immunized before. So the possibility of at least making the vaccine more broadly available and then going back and revaccinating people within a week, for example, who did not get a take rate, may indeed stretch the vaccine. And that is something we are seriously looking at and considering.

Mr. BURTON. I have one more question for this panel, and if my colleagues have any, that's fine.

Dr. Ken Alibek has talked about the need to develop vaccines or other treatments to provide nonspecific immunity. Dr. Heilman, can you please explain his theory and what NIAID and others are doing in this field?

Ms. HEILMAN. The concept of being able to in some way prime the general immune system such that when you had an assault such as a bioterrorist agent or some other pathogen, the immune system would already be primed is indeed an area of a lot of investigation. This area is much more in the basic arena at this point in time, and the ability to translate anything into a clinical trial to validate it is still kind of early, but there are a number of people that are looking at ways to tweak the immune system to keep it primed enough, but not overprimed, to be able to be responsive quickly.

Mr. BURTON. So you are looking at something that may be a panacea for number of diseases. I would like to get one shot instead of tons. I am sure our children would, too. Children receive as

many as 25 or 26 vaccinations before they start school, and there has been some severe side effects with some of those.

Ms. WATSON. Just one question before the panel concludes. Thank you so much for being here. I am just now coming in to hear you, but I harken back to the recent death that have occurred because of anthrax, and it seems like even describing the classical symptoms, the healthcare providers did not or were not able to diagnose. Are we doing a better job of trying to train the personnel out in the hospital emergency rooms to be able to identify these communicable diseases and bioterrorism kinds of agents? How are we doing along that line? I am very disturbed that they misdiagnosed and death occurred.

Ms. HEILMAN. I would like to respond on behalf of the Department. This is an area that is primarily the responsibility of the Centers for Disease Control. But I do know there has been a lot of effort both within the Centers for Disease Control and Prevention as well as within medical societies, for example the Infectious Diseases Society of America, to better train all of our physicians on how best to diagnose. A lot of the activities within the Society have resulted in Web pages and information that's immediately accessible to the infectious disease community.

So I do agree with you that although we are at a point where it is unfortunate that we weren't able to do things immediately, the community has really rallied around the need to be able to better inform. So I think we are in better shape than we were.

Ms. WATSON. Just this last weekend there was a panel on which I served that went on for about 4 hours, and the main questions coming from community-based people is how do we recognize and how do you respond, where do we go? And so the more information that can be given out publicly that is accurate, that everybody is aware of—because they are calling my office as I am sure other Members' offices when they see baby powder on the floor of the restroom. And I had asked the experts, how do you identify anthrax spores—well, probably don't see them at all—and what does the powder look like? And there was a little hesitancy to give a description. They said, you know, call this number. Well, calling the number doesn't give you the answers you want.

So we have a challenge there. I understand you are developing as you go along, but please keep us well informed. And certainly we are talking to CDC everyday, but we want to be able to give answers out there to the general public. Thank you.

Mr. BURTON. I have a whole host of questions we would like to submit to you for the record, and that way we won't keep you here all day, but if you would answer those, we'd appreciate that. Thank you very much.

If you have the opportunity to stick around, we may have some more questions, but we understand that you have demands on your schedule. But if you could make it, we'd appreciate it.

We'd now like to have Wayne B. Jonas, Dr. H. Reg McDaniel, Dr. Sherwood Gorbach and Dr. Richard Klasco come to the table, please. Would you stand, please, so we can have you sworn, please.

[Witnesses sworn.]

Mr. BURTON. Well, you have heard the testimony from the previous panel. I hope that you will incorporate that thinking into

your opening statements, and if you choose to take issue with some of those things, then feel free to do so. We would like to try to get the questions as quickly as possible, so if you have a long opening statement, if you could submit for the record, we'd appreciate it.

Dr. Jonas.

STATEMENTS OF WAYNE B. JONAS, M.D., DIRECTOR, SAMUELI INSTITUTE FOR INFORMATION BIOLOGY, ALEXANDRIA, VA, AND ASSOCIATE PROFESSOR, DEPARTMENT OF FAMILY MEDICINE, UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES, F. EDWARD HEBERT SCHOOL OF MEDICINE; H. REG McDANIEL, M.D., DIRECTOR OF RESEARCH, FISHER INSTITUTE OF MEDICAL RESEARCH, MEDICAL DIRECTOR, MANNATECH, INC., GRAND PRAIRIE, TX; SHERWOOD GORBACH, M.D., TUFTS UNIVERSITY, BOSTON, MA; AND RICHARD S. KLASCO, M.D., MEDICAL DIRECTOR, MICROMEDEX, INC., GREENWOOD VILLAGE, CO

Dr. JONAS. Thank you very much. Mr. Chairman, before I begin, I'd like to point out that some of the research that I will be describing that I conduct has been supported by the Department of Defense and the NIH, and currently is also.

Mr. Chairman and members of the committee, I want to thank you for inviting me to testify on the potential for nonconventional approaches to medicine and health care to the fight against terrorism. I am a medical doctor and basic and clinical researcher who has retired recently after more than 20 years in the military. I was Director of the Medical Research Fellowship at Walter Reed Army Institute of Research where I did research on bioterrorism, and I was also Director of the Office of Alternative Medicine at the NIH where I did work on complementary and alternative medicine. I currently direct the Samueli Institute for Information Biology, which is a nonprofit, freestanding research organization investigating the biology of healing with informational and nonmolecular signals. Those are things like homeopathy, consciousness, the placebo effect, bioenergy, digital biology and bioelectromagnetics.

Much of what I will describe in this testimony is controversial. Some of it has solid data to support it. Some of it is more speculative and can only suggest directions for research. Thus my comments will be focused mostly on practices of potential, but not proven, use. And as we have heard already, I agree that none should be used to substitute for effective treatments and preventive tactics that we have against bioterrorism.

To sort out what works from what does not, it will be necessary to make a focused, concerted investment in research on complementary medicine approaches to terrorism. I have been asked by committee staff and others to comment on homeopathy, digital biology, phototherapy, colloidal silver, essential oils, protobiotics, herbal preparations, dietary supplements and other complementary therapies.

Mrs. MORELLA. Is that all you asked him to do?

Dr. JONAS. As you can imagine, time precludes a discussion of these; however, I have provided some information on most of these in my written testimony.

I will focus on homeopathy, which seems to be the topic of the day because it is a medical system that illustrates both the potential and the scientific neglect of that potential in bioterrorism. First let me give you some historical background on homeopathy and low-dose effects.

The German physician Samuel Hahnemann developed homeopathy about 200 years ago. It is based on the concept that small doses of medicines or toxins or infectious agents for that matter can stimulate a heating response which, when carefully selected to match the symptoms of the disease or the illness of the patient, then is beneficial.

It is of historical interest that the first use of a homeopathic preparation of an infectious agent, which are called nosodes, was done in 1830 by the German veterinarian Gustav Louks, who reported using anthracinum, which is derived from anthrax for the prevention of anthrax in animals. Data collected from conventional compared to homeopathic hospitals in the last century when it was prominent about 100 years ago reported much lower mortality rates in homeopathic hospitals during epidemics of smallpox, scarlet fever, yellow fever, diphtheria, cholera and influenza.

I refer you to the testimony of Joyce Frye for a more complete discussion of this literature, but an example of this is a comparison done in Ohio in the 1920's of 24,000 cases of influenza treated with conventional therapy compared to 26,000 approximately treated with homeopathy. The mortality in the conventional was 28 percent, and the homeopathy was about 1 percent. Let me point out that these mortality differences in epidemics historically may not be due to homeopathy because the conventional treatments used at that time, such as bloodletting and mercury toxicity, likely increased the mortality in conventional hospitals. However, we should not simply discount this information.

There are two sets of recent high-quality, double-blind studies of relevance to biological terrorism. Three double-blind, placebo-controlled trials have been done showing that homeopathic remedy is safe and effective in the treatment of influenza. And Jennifer Jacobs, an epidemiologist at the University of Washington, has done three double-blind, placebo-controlled trials finding homeopathy safe and effective for the treatment of infectious diarrhea. All these data must be considered preliminary. They are not ready for public use.

Chemical warfare might also be approached with low-dose exposures in homeopathy. In 1994, Klaus Linde from the University of Munich and I did an overview of all homeopathic laboratory studies investigating prevention and treatment of toxin exposures. Most of these studies were of poor quality, unfortunately. However, there were two sets of good quality studies that reported an average percent protection with high dilutions of 19.7 percent more than controls.

It is also of historical interest in the 1940's in what was probably the first multicenter double-blind placebo-control study done ever, some British investigators who were fearful of mustard gas exposure in London did a study in two sites looking at the homeopathic preparation of mustard and whether it could protect against mustard gas. They reported it as effective.

I spent part of my military career in Walter Reed Army Institute of Research investigating whether homeopathic preparations might be of use for prevention and treatment in biological attack. One biowarfare agent I studied which has been mentioned today is tularemia, and it is still considered a threat. In a series of 15 laboratory experiments conducted over 2 years, my coinvestigators and I found that homeopathic preparations of tularemia reduced the mortality of lethal exposure to tularemia by 22 percent in mice. Now, this is less than the 100 percent protection that is afforded by a vaccine; however, it might offer a potentially harmless approach for partial protection when vaccines are not available or not yet developed.

At this point it would be irresponsible to recommend that we use homeopathic prophylaxis in place of vaccine therapies or say that they have been proven as a cure; however, certainly this is an area that warrants further discussion.

More recently, our laboratory, again funded with two NIH grants, has shown that the chemical agents may be useful for the prevention and treatment of low-dose—of high-dose toxic agents using homeopathy. For example, we found that low-dose and homeopathic preparations of glutamate, diphtheria and cyclohexamide will protect against exposure to higher doses of these agents. We have repeatedly found that homeopathic preparations of glutamate reduce brain injury by 40 to 50 percent, and this is published the peer review literature.

Not all toxins afford protection in low-dose or homeopathic form. We have screened about a dozen. Some of them do not produce this effect. There is, however, an extensive data base in the low-dose nonhomeopathic literature called hormesis showing that low doses stimulate autoregulatory and healing responses in many models and in many toxins, and these should be looked at as potential protective agents.

Mr. Chairman, members of the committee, it is a fact that the United States has the greatest biomedical scientific research expertise and infrastructure in the world, much of it funded with Federal dollars. It's my opinion that it's time for us to acknowledge that business as usual in biomedical research is no longer adequate. Rather it is essential that we broaden our investment into other potential avenues in the defense of and the healing of terror.

Mr. BURTON. Thank you, Dr. Jonas.

[The prepared statement of Dr. Jonas follows:]

Testimony to the House Government Reform Committee on Complementary Medicine and Bioterrorism

Wayne B. Jonas, MD
Director, Samueli Institute for Information Biology
Associate Professor, Uniformed University of the Health Sciences
November 14, 2001

Mr. Chairman, Congressman Waxman and members of the House Government Reform Committee. Thank you for inviting me to testify on the potential for non-conventional approaches in medicine and healthcare in the fight against terrorism. I am a medical doctor and basic and clinical scientist who recently retired after more than 20 years in the military. I was director of the Medical Research Fellowship at Walter Reed Army Institute of Research from 1991-1995 and director of the Office of Alternative Medicine at the NIH from 1995-1999. I currently direct the Samueli Institute for Information Biology. The Samueli Institute is a non-profit free-standing research organization investigating the biology of healing with informational and non-molecular signals. This includes signals such as homeopathy, consciousness, bioenergy, digital biology and bioelectromagnetics.

Much of what I will describe in this testimony is controversial. Some of it has solid data to support it and some is more speculative and can only suggest directions for future research. Thus, my comments will be focused mostly on practices of potential, but not proven, use. These include homeopathy, consciousness and digital biology. To sort out what works from what does not, it will be necessary to make a focused, concerted investment into research on complementary medicine approaches to terrorism.

First let me give you some historical orientation. Homeopathy is a medical system that illustrates both the potential and the scientific neglect of that potential for bioterrorism. The German physician, Samuel Hahnemann, developed homeopathy about 200 years ago. It is based on the concept that small doses of medicines can stimulate a healing response when carefully selected to match the symptoms of the disease or illness of the patient. I got interested in homeopathy as a young medical army officer stationed in Germany when I saw several severe and refractory conditions, including anti-biotic resistant infections, successfully treated with the system of homeopathy.

A search of the homeopathic medical literature reveals numerous reports of apparently successful treatment of epidemic diseases with homeopathy. Data collected from conventional compared to homeopathic hospitals in the last century consistently reported much lower mortality rates in homeopathic hospitals during epidemics of smallpox, scarlet fever, yellow fever, diphtheria, cholera and influenza.

Please see the testimony by Joyce Frye, MD for a more complete discussion of homeopathy. I will give you two examples from that literature summarized by Julian Winston. "When cholera struck Europe in 1831 the mortality rate (under conventional treatment) was between 40% (Imperial Council of Russia) to 80% (Osler's Practice of Medicine). Out of five people who contracted Cholera, two to four of them died under

regular treatment. Dr. Quin, in London, reported the mortality in the ten homeopathic hospitals in 1831-32 as 9%; Dr. Roth, physician to the king of Bavaria, reported that under homeopathic care the mortality was 7%; Admiral Mordoinow of the Imperial Russian Council reported 10% mortality under homeopathy. During the Influenza Pandemic of 1918, the Journal of the American Institute for Homeopathy, May 1921, had a long article about the use of homeopathy in the flu epidemic. Dr. T A McCann, from Dayton, Ohio, reported that 24,000 cases of flu treated allopathically had a mortality rate of 28.2% while 26,000 cases of flu treated homeopathically had a mortality rate of 1.05%. This last figure was reported by to Dr. McCann by Dean W.A. Pearson of Philadelphia (Hahnemann College) who collected 26,795 cases of flu treated with homeopathy.

A study pertinent to defense from chemical weapons was done in the 1940's. At that time England was fearful of a German attack on London with the chemical blistering agent mustard gas. In what was one of the first double-blind, placebo-controlled studies ever conducted, investigators reported significant protection against mustard gas blistering in subjects pre-exposed to homeopathic preparations of mustard. The experiments were conducted in London and then repeated in Glasgow, Scotland in 1941-2. Both trials demonstrated significant reductions in the severity of blistering in the homeopathic treated group ($p<0.001$). No major side effects were reported from these preparations.

The mortality differences in epidemics between homeopathic and conventional treatment in the last century may not have been from the homeopathic treatment. Instead, standard treatments such as blood-letting and mercury toxicity, prominent at that time, may have increased mortality in the conventional hospitals. In addition, study designs have been significantly improved in the last 50 years. However, we should not simply discount this information. More recent data collected by the government of India reports that homeopathic treatment is of use in severe endemic diseases such as malaria, meningitis, and schistasomiasis. Modern reports of homeopathic treatment of infectious epidemics in farm animals also exist. All these data must be considered preliminary.

There are few scientifically rigorous published studies on homeopathy of relevance to biological and chemical terrorism. Three double-blind placebo controlled trials have been done showing that the homeopathic remedy Oscillococinum is safe and effective in the treatment of influenza. Jennifer Jacobs, MD, MPH an epidemiologist from the University of Washington has done three double blind, placebo-controlled trials finding homeopathy safe and effective for the treatment of infectious diarrhea. In 1994, Klaus Linde from the Unversity of Munich and I did an overview of all homeopathic laboratory studies investigating prevention and treatment of high dose toxin exposures. Out of several hundred studies, two sets of high quality studies reported protective effects from homeopathic dilutions of mercury and arsenic in animal models. The average percent protection by homeopathy was 19.7% greater than controls.

I spent part of my military carrier at Walter Reed Army Institute of Research investigating whether homeopathic preparations of the infectious biowarfare agent

tularemia could be used to protect against a lethal tularemia infection. In a series of 15 laboratory experiments conducted over a year, my co-investigators and I found that homeopathic preparations of tularemia reduced mortality from lethal tularemia infection by 22% in mice. This is less than the 100% protection provided by a good vaccine, but may offer a potentially harmless approach for partial protection when vaccines are not available or not yet developed. Recently, our laboratory also has shown that other toxic agents are useful for prevention and treatment when used as homeopathic preparations. For example, we have found the use of homeopathic glutamate, diphtheria and cyclohexamide will protect against toxicity from exposure to these toxic agents. We have repeatedly found that homeopathic preparations of glutamate reduce brain damage in stroke by 40-50% in laboratory models. Other toxins, such as Con-G, PLA2, MPP+ and NMDA do not afford protection in homeopathic form.

Thus, based on these research data and other findings, I ask you to consider that the use of homeopathic preparations for the prevention and treatment of biological and chemical warfare agents needs to be more fully investigated.

Other potential approaches to bioterrorism in complementary medicine also may warrant investigation. Jacques Benveniste, a French researcher reported that he has developed a method that can digitize biological signals. We are currently testing this concept in our laboratory. If confirmed and developed, digitation of biological signals might allow for electronic detection and neutralization of infectious and toxic agents. Another modality, light therapy, sometimes called phototherapy or bioluminescence, was a technique commonly used in US hospitals in the 1940's and 50's to treat post-operative infections. It was abandoned with the development of antibiotics but may still have potential for use for the prevention and treatment of infection. Ozone has been shown to inactivate viruses in blood and may be useful for preventing the spread of bioterrorist agents. Finally, the use of friendly bacteria introduced into the bowel (protobiotics) may help prevent the overgrowth of unfriendly bacteria and reduce the adverse consequences of prolonged antibiotics on the person's normal flora.

I was also asked by Committee staff to comment on some other popular complementary approaches currently being suggested as of value for bioterrorism. These include colloidal silver, essential oils and herbal preparations. A search of the medical literature on currently popular alternative medicine products such as colloidal silver, for example, shows no clinical trials against any organism on the current bioterrorism list. While silver products are used to suppress infection in burns, oral silver has not been shown to be effective against infection and is toxic to humans in moderate doses. Essential oils are another popular remedy for treatment of skin infections and when applied with massage, for reducing anxiety and stress. While many oils have mild anti-viral, anti-bacterial or anti-fungal properties none has been proven to irradiate the infections of concern in bioterrorism. Some herbal combinations, however, do have the potential to treat these infections. For example, an ancient Chinese herbal treatment is proving itself to be an effective weapon against anti-biotic resistant malaria of the brain.

Mr. Chairman and members of the committee, it is a fact that the United States has the greatest biomedical and scientific research expertise and infrastructure in the world, much of it funded by federal dollars. These resources are not being put toward the investigation or unorthodox approaches to bioterrorism because of a belief that they are not useful by the conventional community. It is my opinion that it is time for us to acknowledge that "business as usual" in biomedical research is no longer adequate; rather it is essential that we broaden our investment to other potential avenues in the defense of and healing from terror.

Thank you for your time and consideration. I would be happy to answer any questions.

Mr. BURTON. Dr. McDaniel.

Dr. MCDANIEL. Mr. Chairman and members of the House Committee on Government Reform, it is a privilege to be asked to appear before this panel of Members of the House, invited to testify with the professionals and scientists chosen to address the problems of bioterrorism.

If it were not for the passage of the Dietary Supplement Health and Education Act of 1994 [DSHEA], my comments and written information given to you would not exist. I as a physician, who I might say was initially quite skeptical, now commend the Congress for its unanimous vote that passed this legislation.

My comments and written submission are focused on the impact of glyconutrients, dietary sugars, not herbs or oriental preparations, have with the human body that support and enhance natural defense mechanisms against infectious disease. They also are taken in support of standard therapy. Slide 1 that is included in the packet identifies 30 scientists and 11 institutions in the United States that performed experiments on our dietary ingredients and reported their results for peer review. Slide 2 identifies researchers outside the United States that have contributed to the development of clinical applications of glyconutrition. Over 200 scientific presentations have been made by these scientists on the glycoscience of these micronutrients.

When research was initiated in the early 1980's, it was a scientific heresy to represent that sugars have significant biological roles to play in the biochemistry of life processes. It had been incorrectly accepted that glyconutrients, known as dietary sugars, monosaccharides, carbohydrates were simply burned for energy to support life. Slide 3 is a collection of journals that validate the very major role sugars play in the structure and especially the function of the human body. Glycobiology and glyconutrition are now recognized as cutting-edge technology. Dietary sugars are critical components in the molecular structure of compounds synthesized in cells that conduct the complex and marvelous processes we call life, and this includes protection and defense against infectious agents.

Multiple bacteria and viruses have been shown to be killed and inactivated in cell cultures and in animals by glyconutrients. This was done because humans claimed benefit from this before we did the laboratory examinations. With our limited funds, we have shown five viruses are inactivated. Independently, Lancet in 1996 contains a review article citing similar saccharides induced action against 37 infectious agents classified as pathologic bacteria, viruses, fungi and protozoans.

Evidence is expanding that supplying concentrated micronutrients of which glyconutrients are a major category will support relief for chronic and acute diseases in a manner unmatched for a lack of toxicity with unparalleled low cost. This is accomplished by nutritional support of intracellular molecular synthesis under the control of the genetic code that, much like a computer program, contains the instructions for the biochemistry of life; that is, normal structure and function. Such instructions enable appropriate recognition and response to invading microorganisms.

How is this possible with nontoxic dietary supplements? There is a common belief promulgated by authorities in medicine and nutri-

tion that all one needs for good health and healing is a good general diet with variety. The statement may be correct for those who are healthy. We have found it is not sufficient for those with chronic and recurrent diseases, especially infections. In instances of unusual, epidemic and virulent infectious agent exposure, glyconutrient supplementation has been found effective for enhancing general immune function and defense. When supplied at a higher level and available in nature, sugars needed for cellular synthesis can take innate defense mechanisms to a much higher level that are effective against infectious agents. The biochemical principles responsible for this phenomenon and mechanisms of action are in your written material.

Body defense, such as the mechanisms that act naturally when we recover from a common cold or influenza, can now be up-regulated to destroy virulent organisms associated with more virulent disease. Such benefit is the result of increased synthesis of slide 4 cell-to-cell communication molecules that act like tiny IBM cards sent between cells to provide instructions for destroying bacteria, viruses and other infectious organisms. Slide 5 increasing the levels of glyconutrients in the diet increases the synthesis of these anti-infection molecules.

The bar graph provided is evidence of the functional antiviral activity described. It is an example of the increase in general defense against infectious organisms that results when glyconutrients are progressively added to the diet.

There is a current concern for not only preventing and destroying anthrax bacteria, but neutralizing toxins that attack host cell membranes. Physicians have reported apparent neutralization of bacterial toxins produced by various species of bacteria and full recovery of patients near death. In addition, there have been a few reports in major trauma and postsurgical infections complicated with multiple-drug-resistant organisms that dietary glyconutrients rendered the patients afebrile within hours of use and shortened hospital expected stays. Minimal morbidity occurred in patients expected to die, based on abundant prior medical experience.

Under the provisions of DSHEA, glyconutrient formulations, of which I am listed as a coinventor, have been marketed for nearly 8 years. Over 750,000 people have consumed them. Currently we estimate over 200,000 people consume our glyconutrients daily. Several thousand have taken the supplements continuously for 8 years. There have been no significant toxic reactions or fatalities, and complications have been limited to rare food allergies. This attests to the safety of this concentrated dietary nutrient approach.

A research partnership of industry and academia, Texas A&M University School of Veterinary Medicine and Mannatech, Inc., stand ready to move this research forward. If supported by the action of Congress, experimentation on bioterrorist infectious agents will be conducted. There is a real potential through nutritional fortification to neutralize decades of what I would call dark side research on the use of disease-causing agents designed to destroy or incapacitate millions of innocent people. Thank you.

Mr. BURTON. Thank you, Dr. McDaniel.

[The prepared statement of Dr. McDaniel follows:]

Congressional Hearing:
Committee on Government Reform
Daniel Burton, Chairman
November 14, 2001
1:00 P.M. CST

Comprehensive Medical Care for Bioterrorism Exposure: Are we making evidence based decisions? What are the research needs?

Opening Statement by
H. Reg McDaniel, M.D,
Medical Director Mannatech Inc.

Mr. Chairman and members of the House Committee for Government Reform and Oversight. It is a privilege to be asked to appear before this panel of members of the House of Representatives and to be invited to testify with professionals and scientists chosen to address the problem of bio-terrorism.

If it were not for the passage of the Dietary Supplement Health and Education Act of 1994 (DSHEA), my comments and the written information that has been provided would not exist. I commend the Congress for its unanimous vote that passed this legislation.

My comments and written submission are focused on the impact glyconutrients, dietary sugars, have within the human body that support and enhance natural defense mechanisms against infectious agents. Slide (1) identifies 30 scientists from 11 institutions in the United States that have performed experiments on our dietary ingredients and reported their results for peer review. Slide (2) identifies researchers outside this nation that have also contributed to the development of the clinical applications of glyconutrition. Over 200 scientific presentations have been made by these scientists on the glycoscience of these micronutrients.

When research was initiated in the early 80s it was scientific heresy to represent that sugars have significant biological roles to play in the biochemistry of life processes. It had been incorrectly accepted that glyconutrients, (dietary sugars, monosaccharides, carbohydrates) were simply burned for energy to support life. Slide 3 is a collection of

scientific journals that validate the very major role sugars play in the structure and especially functions of the human body. Glycobiology and glyconutrients are now recognized as cutting-edge technology. Dietary sugars are critical components in the molecular structure of compounds synthesized in cells that conduct the complex and marvelous process we call life. This includes protection and defense against infectious agents.

Multiple bacteria and viruses have been shown to be killed or inactivated in cell cultures and in animals by glyconutrients. Similar benefits are now being reported in humans adding the glyconutrients to their diets. The journal Lancet in 1996 contains a review article citing similar saccharide induced action against 37 infectious agents classified as pathogenic bacteria, viruses, fungi, and protozoans.

Evidence is expanding that supplying concentrated micronutrients, of which glyconutrients are a major category, will support relief for acute and chronic diseases in a manner unmatched for a lack of toxicity with unparalleled low-cost. This is accomplished by nutritional support of intracellular molecular synthesis under control of the genetic code, that much like a computer program, contains the instructions for the biochemistry of life, that is, normal structure and function. Such instructions enable appropriate recognition and response to invading microorganisms.

How is this possible with non-toxic dietary supplements? There is a common belief promulgated by authorities in medicine and nutrition that all one needs for good health

and healing is a good general diet with variety. The statement may be correct for those who are healthy. We have found it is not sufficient for those with chronic and recurrent diseases, especially infections. In instances of unusual, epidemic, or virulent infectious agent exposure, glyconutrient supplementation has been found effective for enhancing general immune function and defense. When supplied at a higher level than available in nature, sugars needed for cellular synthesis can take innate defense systems to a much higher level that are effective against infectious agents. The biochemical principles responsible for this phenomenon and mechanisms of action are in your written material.

Body defense, such as the mechanisms that act naturally when we recover from a common cold or influenza, can now be up-regulated to destroy virulent organisms associated with more serious disease. Such benefit is the result of increased synthesis of cell-to-cell communication molecules that act like tiny IBM cards sent between cells to provide instructions for destroying bacteria, viruses or other infectious organisms. Increasing the level of glyconutrients in the diet increases synthesis of these anti-infection molecules.

In the bar graph provided is evidence of the functional antiviral activity described. It is an example of the increase in general defense against infectious organisms that results when glyconutrients are progressively added to the diet.

There is a current concern for not only preventing and destroying anthrax bacteria, but neutralizing toxins that attack host cell membranes. Physicians have reported the

apparent neutralization of bacterial toxins produced by various species of bacteria and full recovery of patients near death. In addition, there have been a few reports in major trauma or post-surgical infections complicated with multiple-drug resistant bacteria, that dietary glyconutrients rendered the patient afebrile within hours of use and shortened hospital expected stay. Minimal morbidity occurred in patients expected to die, based on abundant prior medical experience.

Under provisions of DSHEA, glyconutrient formulations on which I am listed as a co-inventor have been marketed for nearly eight years and over 750,000 people have consumed them. Currently, we estimate over 200,000 persons consume our glyconutrient supplements daily. Several thousand have taken the supplements continuously for eight years. There have been no significant toxic reactions or fatalities, and complications have been limited to rare food allergies. This attests to the safety of these concentrated dietary nutrients.

A research partnership of industry and academia, Texas A and M University School of Veterinary Medicine and Mannatech Inc. stand ready to move this research forward. If supported by an action of Congress, experimentation on bioterrorist infectious agents will be conducted. There is the real potential through nutritional fortification to neutralize decades of dark-side research on the use of disease causing agents designed to destroy or incapacitate millions of innocent people. HRMcD 11/14/01

Slide 1

ACADEMIC AND INDEPENDENT INVESTIGATORS WHO HAVE CONTRIBUTED BASIC SCIENCE AND CLINICAL DEVELOPMENT TO GLYCONUTRIENT AND MICRONUTRIENT FORMULATIONS AND INGREDIENTS

Texas A and M School of Veterinary Medicine, College Station, Texas

David Busbee, Ph.D.	**Maurice Kemp, Ph.D.**
Ian Tizard, Ph.D.	**Robert Carpenter, D.V.M.**
A.D. Chinnah, Ph.D.	**S.Y. Peng, Ph.D.**
R. Barhoumi, Ph.D.	**E. A. Merriam, Ph.D.**
L.P. Flood, D.V.M.	**R.C. Burghardt, Ph.D.**
B.D. Campbell, B.S.	**C.J. R. Welsh, Ph.D.**

University of Texas Health Science Center-Houston, Texas
Gailen Marshall, M.D., Ph.D.

M.D, Anderson Cancer Center- Radiobiology Institute, Houston, Texas

D.B. Robers, Ph.D.	**E.L. Travis, Ph.D.**

University of Texas Health Science Center- San Antonio, Texas
Charles Gauntt, Ph.D.

University of Texas Health Science Center- Lubbock, Texas

D. Lefkowitz, Ph.D.	**S. Lefkowitz, Ph.D.**

University of Texas Health Science Center, Dallas, Texas

J.H. Helderman, M.D.	**D. Wonble, Ph.D.**

University of Texas Health Science Center, Ft. Worth, Texas
J. Measel, Ph.D.

Baylor College of Dentistry, Dallas, Texas

J.P. Lenons, DDS, MS	**T. Rees, DDS, MSD**
W.H. Binnie, DDS, MSD	**J.M. Wright, DDS, MS**
I. Gao, M.D., Ph.D.	**J.E. Hall, DDS**

Research Foundation, San Antonio, Texas
G. Kaats, Ph.D

Southern Research Institute, Birmingham, Alabama
J. Kahlon, Ph.D.

New York University Medical Center, New York City, New York
C. Reich, M.D.

Slide 2

CONTRIBUTORS TO THE DEVELOPMENT OF GLYCONUTRIENTS RESIDING OUTSIDE THE UNITED STATES

Basic Science:

Puerto Rico School of Medicine, Dept. Plastic Surgery
M. Rodigues-Bigas, M.D.

Clinical Trials or Studies:

Chloe Hospital, Tel Aviv, Israel
I. Tiomy, M.D. **T. Gilat, M.D.**

Canadian HIV Trials Network, Vancouver, British Columbia, Canada

J. Ruedy, M.D.

Belgium federation of Health Institutions

D. Weerts, Ph.D. **N. Clumeck, M.D.**

Slide 3

Recent Issues of Journals Containing Articles Relating to Glycobiology and Glycobiochemistry

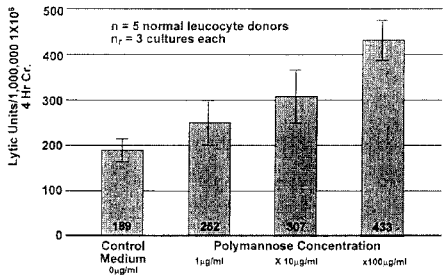
Volume 161 of *Acta Anatomica,* 1998, contains 15 review articles with hundreds of independent research article citations describing the vital role monosaccharides and their bio-polymers have in life processes. The activities described range from cells differentiating into tissue types and organs in the human embryo to the structure of cell membranes and hormonal regulation of what goes in and out of cells in the mature adult. The first review article (N. Sharon) informs the reader that in the 1980s there were virtually no papers published on glycoscience. The field of experimentation had expanded to the point that a Medlar computer search for key word and titles for terms used in glycomzbiology and glycoscience found over 20,000 papers published in 1995.

The volume 291, March 23rd issue of ***Science*** contains 12 short, but very technical articles on glycoscience and its application to health. This is the official journal of the American Association for the Advancement of Science. In addition, The ***Technology Review***, the Massachusetts Institute of Technology, magazine of innovation, October 2001, issue contains a short overview of information included in the above lengthy articles and their voluminous body of knowledge.

Slide 4

This graph is a demonstration of how there is an increase in destruction of virus infected target cells that is directly related to the level of glyconutrient added to culture medium of harvested leukocytes that were precultured with the glyconutrient before being added to the bioassay culture. As was shown in the handout, G. Marshall published evidence that cytokine production was enhanced by glyconutrients in the pre-culture phase of white cell culturing. This functional assay is provided as an example of how glyconutrition up-regulates innate defense mechanisms against infectious agents. Each rise in height of the bar graph is the average for a group of experiments. The bar rises as the supply of glyconutrient was increased in the medium of the pre-cultured white cells.

In Vitro Effect of Polymannose on Human PBL in 4 Hour NK Cytosis Functional Assay



G. Marshall, J.P. Drack, *Clin. Immun. Society*, Abstract 1381, May, 1993

In the above experiments virus infected cells (HerpesII) are prepared in culture and then loaded with chromium-51 isotope. Virus and isotope not taken inside the target cells are washed from the culture. Leukocytes pre-cultured overnight with increasing amounts of glyconutrient, as indicated, are added to the target culture cells. A type of white cell, natural killer (NK) lymphocytes, are activated by antiviral cytokines. The NK cells attack and destroy the virus-infected cells by secreting an enzyme (perforin) to cut lethal holes in the cell membrane of the virus infected cells to destroy the sources of virus production. The bar plots are the leakage of the radio-isotope Cr-51 from the destroyed virus-infected target cells after four hours of exposure to the NK lymphocytes. Note that the isotope leakage into the medium is directly related to the level of glyconutrient supplied to the white cells before exposure to the virus-infected cells.

Similar enhancement of other innate defenses against infectious agents has been demonstrated that include an increase in phagocytosis and killing of yeast, Gram + and Gram – bacteria (S. and D. Lefkowitz 2000,2001, and antibody production (Zacek, et.al. 1988, Gaunt 1997).

Mr. BURTON. Dr. Gorbach.

Dr. GORBACH. Thank you, Mr. Chairman and members of the committee, for your kind invitation. I am an infectious disease physician. I am going to be talking about the use of probiotics, which is a dietary supplement for prevention of side effects associated with antibiotic use for prevention of anthrax.

It's estimated that 32,000 persons are currently taking prophylactic antibiotics for periods of 60 days for potential exposure to anthrax in the workplace. The most commonly prescribed drug is Cipro, which is in a class of fluoroquinolones.

Cipro is a drug that has been used for the past 14 years in treating over 300 million persons as out-patients and within the hospitals. It has one of the best safety records of any antibiotic that is used to treat serious infections. Nevertheless, the package insert reports an incidence of 16 percent of adverse effects possibly or probably related to taking Cipro. Extrapolating to the 32,000 taking the drug currently, this could mean between 2,000 and 5,000 of these people could experience side effects, and this relates to the usual duration of treatment, 7 to 14 days. The number could be considerably higher during a 60-day exposure.

The most common side effects of all oral antibiotics relates to the intestinal tract, as you had stated. Nausea, abdominal cramps, diarrhea and loose bowels are the major complaints. It appears that antibiotics upset the normal balance of healthy bacteria that inhabit our intestine. Restoring these healthy bacteria and normalizing our balance is the way to recovery from the ill effects of antibiotics.

One approach to reestablishing the normal balance is to implant healthy bacteria by using probiotics. Many of you will recognize these products as consisting of Lactobacilli, the bacteria that have been used since Biblical times to make fermented dairy products such as yogurt, sour cream and cottage cheese. These Lactobacilli are considered dietary supplements and are recognized by the Food and Drug Administration as generally regarded as safe. In our country, various probiotics are sold in the supermarkets as dairy products and over the counter as capsules and tablets.

I developed a probiotic in 1983 which is known as Lactobacillus GG or LGG. This product was patented in 1985 and is sold in this country as a capsule by ConAgra by the name of Culturelle. LGG is 1 of a family of about 15 probiotics that are sold under various trade names in various countries. What distinguishes LGG from other antibiotics is the record of scientific research that has confirmed its safety and efficacy. Over 100 publications in medical and scientific journals has documented the beneficial effects of LGG.

In relation to this hearing, I would like to recount the results of two published studies published in the journals Pediatrics and the Journal of Pediatrics of preventing antibiotics side effects with LGG. In 1999, Dr. Jon Vanderhoof and colleagues in Omaha reported on a trial of LGG in preventing side effects in 188 children who received antibiotics for common respiratory infections. At the end of 10 days, 26 percent of the children who received placebo developed diarrhea compared to only 8 percent of the LGG-treated children, a threefold difference in diarrhea rate. Using a similar de-

sign, a group from Tampere, Finland, also found a threefold reduction in antibiotic-associated diarrhea.

While these reports are encouraging for using probiotics to prevent side effects relating to antibiotics, important caveats need to be issued with regard to the current situation of antibiotic prescriptions for anthrax prevention. These probiotic studies relate to antibiotics that are used in children, generally ampicillin, amoxicillin and erythromycin, not to Cipro, a drug that is not prescribed for children.

Indeed, we have no information about using probiotics to prevent intestinal side effects due to Cipro. If the mechanism of disturbing the intestinal flora holds for all antibiotics, then probiotics, which restore normal healthy bacteria to the intestine, might work as well with Cipro, but this remains to be proven.

Another issue relates to the long course of Cipro usage now recommended for 60 days. In the studies reported above, the antibiotics were used in children for an average of 7 to 10 days. Whether the salutary benefits of LGG would persist for a treatment period of 60 days remains to be proven.

The final point is that these reported benefits relate to LGG, not to probiotics in general or to yogurts in general. Each type of probiotic is somewhat different, and each one must be compared in a clinical trial to show that it is beneficial.

In summary, Mr. Chairman, a probiotic such as LGG could provide protection from the expected intestinal side effects associated with antibiotic prophylaxis for anthrax exposure. Based on published research, LGG could reduce these side effects by two-thirds. Probiotics offer a safe, reasonably inexpensive means to lower the rate of such adverse effects with antibiotic usage; however, more research is needed before these products can be recommended for wide usage.

Thank you for your attention.

Mr. BURTON. Thank you, Dr. Gorbach.

[The prepared statement of Dr. Gorbach follows:]

Opening Statement of Sherwood Gorbach

I am Sherwood Gorbach, a physician who specializes in nutritional aspects of infectious diseases. My academic appointment is Professor of Community Health and Medicine at Tufts University School of Medicine in Boston. I am here to discuss nutritional and intestinal side effects of antibiotics, specifically relating to the use of antibiotics in preventing anthrax infection.

It is estimated that 32,000 persons are currently taking prophylactic antibiotics for this indication. Many will take these drugs for 60 days for potential exposure to anthrax in the workplace. The most commonly prescribed drug is Cipro, which is in the class of fluoroquinolones. Doxycycline, other fluoroquinolones, and ampicillin are alternative drugs that are sometimes used for prevention of inhalational anthrax. It is fair to say that this is an unprecedented situation in that so many previously healthy people are taking these drugs for a long period of time in order to prevent a disease. Side effects to these antibiotics have already been reported and are likely to become a significant issue as more drugs are prescribed.

Cipro is a drug that has been used for the past 14 years in treating over 300 million persons as outpatients and within the hospital. It has one best safety records of any antibiotic that is used to treat serious infections. Nevertheless, the package insert reports definite side effects in 7.3 per cent of users, and possible side effects in another 9.2 per cent, for a total incidence of 16.5 per cent of adverse events possibly or probably related to taking Cipro. Extrapolating to the 32,000 taking the drug currently, this could mean that between 2000 and 5000 of these people could experience side effects – and this relates to the usual duration of treatment, 7 to 14 days. The number could be considerably higher during a 60-day period of exposure.

The most common side effects of oral antibiotics relate to the intestinal tract. Nausea, abdominal cramps, diarrhea and loose bowels are the major complaints. In the case of Cipro, intestinal problems outnumber all other side effects by about 5 to 1. Intestinal side effects are also common with doxycycline and especially with ampicillin.

The mechanism by which antibiotics produce these intestinal side effects is unknown. The most popular theory is that antibiotics upset the normal balance of healthy bacteria that inhabit our intestine. These bacteria make up what is known as the normal flora. Restoring these healthy bacteria and normalizing this balance within our intestine is the way to recovery from the ill effects of antibiotics.

One approach to reestablishing the normal balance of healthy bacteria is to use a class of products that are known as probiotics. Many of you will recognize these products as consisting of Lactobacilli, the bacteria that have been used since Biblical times to make fermented dairy products such as yogurt, sour cream and cottage cheese. In the past 20 years new types of Lactobacilli have been developed which not only produce good dairy products but can also enhance human health. This new class of Lactobacilli is known as a probiotic, which is defined as living bacteria which when consumed in sufficient

quantities can improve human health by balancing and normalizing the intestinal flora. These Lactobacilli are considered dietary supplements and are recognized by the Food and Drug Administration as "Generally Regarded As Safe", the so-called GRAS designation. In our country various probiotics are sold in the supermarkets as dairy products and over-the-counter as capsules and tablets.

I have worked in the field of probiotics and Lactobacilli for over 35 years. Along with a colleague, Dr. Barry Goldin, we developed a probiotic in 1983 which was isolated from the intestinal tract of a healthy human being. It is known as Lactobacillus GG, or LGG. This product was patented in 1985 and is sold in this country as a capsule by ConAgra under the name "Culturelle." It is also available in 30 countries in Europe, South American and Asia in pill form or as a dairy product. LGG is one of a family of about 15 probiotics that are sold under various trade names in many countries. What distinguishes LGG from other probiotics is the record of scientific research that has confirmed its efficacy and safety in human ailments. Over 100 publications in medical and scientific journals have documented the beneficial properties of LGG. No other probiotic has such a strong record of scientific investigations to support its claims.

In relation to this hearing I would like to recount the results of 3 published studies of preventing antibiotic side effects with LGG. In 1999, Dr. Jon Vanderhoof and colleagues at the University of Nebraska and Creighton University reported in the Journal of Pediatrics on a trial of LGG in preventing side effects in 188 children who received antibiotics for common respiratory infections (1). These children were divided randomly into 2 groups, those given LGG along with the antibiotics and those given placebo with antibiotics. This was a double-blinded study in that neither the children or their parents nor the study nurses knew which treatment was given. At the end of 10 days 25 (26%) of children who received placebo developed diarrhea, compared to only 7 (8%) of the LGG-treated children, a 3-fold difference in diarrhea rate. Using a similar research design, a group from Tampere, Finland published in Pediatrics also in 1999 that LGG reduced diarrhea rates in 119 Finnish children from 16% in the placebo group to 5% in the LGG-treated group, again a 3-fold decrease in intestinal side effects (2). A third, but smaller, study reported in 1990 that side effects of diarrhea and abdominal pain with erythromycin treatment were reduced by LGG (3).

While these reports are encouraging for using probiotics to prevent side effects related to antibiotics, important caveats need to be issued with regard to the current situation of antibiotic prescriptions for anthrax prevention. These probiotic studies relate to antibiotics that were used children, generally ampicillin, amoxicillin and erythromycin – not Cipro, a drug that is not prescribed for children. We have no information about using probiotics to prevent intestinal side effects due to Cipro. If the mechanism of disturbing the intestinal flora holds for all antibiotics, then probiotics, which restore healthy bacteria to the intestine, might work as well with Cipro – but that remains to be proven. Another issue relates to the long course of Cipro usage, now recommended for 60 days. In the studies reported above the antibiotics were used in children for an average of 7 to 10 days. Whether the salutary effects of LGG would persist for a treatment course of 60 days remains to be proven. The final point is that these reported benefits relate to LGG not to

probiotics in general. Each type of probiotic is somewhat different from the others and it must be shown by clinical trials that a specific brand has the same effects as those reported for LGG.

In summary, a probiotic such as LGG could provide some protection from the expected intestinal side effects associated with antibiotic prophylaxis for anthrax exposure. Based on published research, LGG could reduce these side effects by two thirds. Probiotics offer a safe, reasonably inexpensive means to achieve a lower rate of such adverse events with antibiotic usage. I would urge, however, that additional research be conducted to establish whether a probiotic such as LGG can prevent antibiotic-associated intestinal side effects under the current circumstances, namely, a 60-day exposure of healthy persons to Cipro or similar drugs for prevention of anthrax exposure.

Thank you for your kind attention.

Sherwood L. Gorbach, M.D.
Tufts University School of Medicine

1. VANDERHOOF, J.A., WHITNEY, D.B., ANTONSON, D.L., HANNER, T.L., LUPO, J.V., and YOUNG, R.J. 1999. *Lactobacillus* GG in the prevention of antibiotic-associated diarrhoea in children. *J. Pediatr.* 135: 564-568.

2. ARVOLA, T., LAIHO, K., TORKKELI, S., MYKKÄNEN, H., SALMINEN, S., MAUNULA, L., and ISOLAURI, E. 1999. Prophylactic *Lactobacillus* GG reduces antibiotic-associated diarrhoea in children with respiratory infections: a randomized study. *Pediatrics* 104(5): e64.

3. SIITONEN, S., VAPAATALO, H., SALMINEN, S., GORDIN, A., SAXELIN, M., WIKBERG, R., and KIRKKOLA, A.-L. 1990. Effect of *Lactobacillus* GG yoghurt in prevention of antibiotic associated diarrhoea. *Ann. Med.* 22: 57-59.

Mr. BURTON. Dr. Klasco.

Dr. KLASCO. Mr. Chairman and distinguished members of the committee, I appreciate the opportunity to testify before you today. I am an emergency physician and vice president of medical affairs at Micromedex.

September 11 taught us several valuable lessons. One thing that we learned is that America's police, firefighters and healthcare workers deserve our very special praise. Together with the brave men and women in the Armed Forces, they are on the front line of this new war against terrorism.

We also learned that these agencies, and indeed every potential American victim of biological terrorism, have an urgent need for quick access to comprehensive and accurate information to guide effective triage and treatment.

Mr. Chairman, I know the importance of this from my own personal experiences as an emergency physician. In an emergency rapid access to reliable information can in a very real sense mean the very difference between life and death. I was on duty in the ER during the Columbine High School shootings. Critically wounded students arrived who had suffered gunshot wounds to both their spinal cords and bowels. The problem that this situation poses is that the recommended treatment for spinal cord injury, a drug that might offer these children the chance to walk again, seriously increases the risk of infection, and such an infection can be a life-threatening complication of bowel injury. To decide whether to administer this drug, I consulted a computerized medical information data base in the ER and was able to quickly retrieve the information needed to provide the best possible care.

The information that I used on the day of the Columbine shootings and many times before and since, and the computer system that provided me access to that information is what is known in the medical field as decision support technology. It allows a caregiver real-time access to information that can establish a diagnosis, suggest a treatment and in the process improve medical outcomes.

Mr. Chairman, in the wake of recent events, it is clear that our Nation's emergency responders could strongly benefit from access to similar decision support technology. To meet this need, Micromedex has been working day and night over the past several weeks to develop BioDex, an electronic information product delivered on a CD Rom for use in a personal computer, and mobile BioDex, an electronic product that can be accessed by an emergency responder at the response site via a hand-held device.

BioDex contains comprehensive, easy-to-access information on all of the agents likely to be used in a bioterrorist event, including information on all of the treatable CDC category A critical biological agents, their appropriate medical treatments, including antidotes and drugs, and appropriate protective clothing to ensure the safety of our healthcare workers and first responders.

While this type of information might sound dry or academic, anyone who has watched the recent difficulties experienced by a myriad of public health, law enforcement and other government officials in attempting to respond to the introduction of anthrax into the U.S. mails knows otherwise. The importance of quick access to

information to protect public safety and to treat victims cannot be overstated. Quite simply, BioDex can save lives.

Mr. Chairman, Micromedex would like to partner with the Federal Government to immediately get this crucial information into the hands of the more than 22,000 law enforcement agencies, 29,000 fire departments and 6,000 hospitals in the United States. Within days and with your help, we can provide all of those on the front lines of bioterror response with BioDex.

Micromedex is a Colorado-based division of the Thomson Corp. and is uniquely qualified to help these new American heroes in carrying out their mission. We are the premier manufacturer of medical information data bases for decision support. For almost 30 years, Micromedex has been the reference standard for every U.S. poison center. U.S. Military health professionals used us for on-the-spot decision support during Operations Desert Storm and Desert Shield. Our information guided military healthcare workers in the diagnosis and treatment of a variety of unusual and exotic health risks, from the special chemicals used regularly by the military to the poisonous snakes and plants indigenous to the area, and prepared them for biological and chemical threats. Micromedex's knowledge also helped the World Health Organization to diagnose and treat the victims of the Wakayama, Japan, arsenic poisonings.

Over 500 physicians, pharmacists and healthcare experts from leading universities such as Harvard and Stanford make up the Micromedex editorial board that reviews this content. With a staff of 400, Micromedex reviews the world's literature every day.

Mr. Chairman, accurate comprehensive medical information in the hands of our Nation's emergency responders can strongly improve the safety and effectiveness of any response to biological or chemical terror. I hope that the members of this committee can support our efforts to put this knowledge into the hands of these individuals and entities.

Finally, Mr. Chairman, Micromedex is proud of its corporate good citizenship. Our parent organization, the Thomson Corp., has already pledged $5 million to World Trade Center relief efforts and to assist the families and loved ones of victims.

I appreciate the opportunity to testify before the committee and will be pleased to answer any questions that you may have.

Mr. BURTON. Thank you, Dr. Klasco.

[The prepared statement of Dr. Klasco follows:]

MICROMEDEX
THOMSON HEALTHCARE

Testimony of Rich Klasco, M.D.

Vice President, Micromedex Corporation

Before the

House Committee on Government Reform

November 14, 2001

Mr. Chairman and distinguished members of the Committee, I appreciate the opportunity to testify before you today.

September 11 taught us many things, good and bad.

One good thing we learned is that America has over 57,000 heroic agencies on call, 24 hours a day, seven days a week. Police, firefighters, emergency responders and health care providers, who deserve our very special praise. Together with the brave men and women in our armed forces, they are on the front lines of this new war against terrorism.

Another thing we learned is that every American police station, fire department, and emergency medical service—and, indeed, every potential American victim of biological terrorism--has an urgent need for quick access to comprehensive and accurate information to assist in triage and treatment.

Mr. Chairman, I know the importance of this from my personal experiences as an emergency room physician. When a life is in your hands, and you have only minutes, sometimes seconds, to make the right decision, you need information--good, hard, quick information.

I was on call in the ER on the day of the Columbine High School shootings. Wounded students soon arrived who had suffered gunshot trauma to both their spinal columns and their bowels. The problem this situation poses is that the recommended drug treatment for spinal injury is also known to seriously heighten the risk of severe infection, and such infection can be a major life-threatening complication of a bowel injury. In order to decide whether to administer this drug, I (along with two colleagues) consulted a computerized medical information database in the ER. We were able to quickly retrieve the information we needed to make a sound and immediate medical care decision.

The information that I used the day of the Columbine shootings – and many times before and since – and the computer system that provided me access to that information in the ER, is what is known in the medical field as "decision support" technology. It allows a care giver real time access to information that can confirm or correct a diagnosis or treatment and, in the process, improve medical outcomes.

MICROMEDEX
THOMSON HEALTHCARE

Testimony of Rich Klasco, M.D.
November 14, 2001
Page Two

Mr. Chairman, in the wake of recent events, it is clear that our nation's emergency responders could strongly benefit from access to similar decision support technology in order to respond effectively to biological terrorism. To meet this need, Micromedex has been working day and night over the past eight weeks to develop *BioDex*, an electronic information product delivered on CD-ROM for use on a personal computer, and *Mobile BioDex*, an electronic product that can be accessed by an emergency responder at the response site via a hand-held device.

BioDex contains comprehensive, easy to access information on all the agents most likely to be used in a bioterrorist event, including information regarding all of the treatable CDC "Category A" critical biological agents, their appropriate medical treatments, including antidotes and drugs, and the appropriate protective clothing to ensure the safety of healthcare workers and first responders.

While this type of information may sound boring, anyone who has watched the recent difficulties experienced by a myriad of public health, law enforcement and other government officials attempting to quickly find and communicate accurate information to respond to the introduction of Anthrax into the U.S. mails knows otherwise. The importance of quick access to comprehensive and accurate information on biological agents to the protection of public safety and medical personnel, and to the proper treatment of victims of biological exposures cannot be overstated. Quite simply: *BioDex* can save lives.

Mr. Chairman, Micromedex would like to partner with the federal government to immediately get this crucial information into the hands of the more than 22,000 law enforcement agencies, 29,000 fire departments, and 6,000 hospitals in the United States. Within days, and with your help, we can provide all of those on the frontlines of bioterror response with BioDex. It will be accessed on a local computer with a version downloadable to a hand-held device. To ensure our first responders have access to this life-saving information, we would also propose preloading a handheld device with the mobile BioDex product and providing this along with the BioDex CD.

A Colorado-based division of The Thomson Corporation, Micromedex is uniquely qualified to help these new American heroes in carrying out their mission of protecting Americans from bioterrorism through preparedness and response planning. Micromedex is the premier manufacturer of medical information databases for decision support.

- For almost 30 years, Micromedex has been the reference standard for every U.S. poison center.

MICROMEDEX
THOMSON HEALTHCARE

Testimony of Rich Klasco, M.D.
November 14, 2001
Page Three

- U.S. military health professionals used us for on-the-spot decision support during Operations Desert Storm and Desert Shield.
- In addition, at the DOD's request, Micromedex personnel back in the U.S. provided round-the-clock consultation regarding diagnosis and treatment of a variety of unusual and exotic health risks, from the special chemicals used regularly by the military to poisonous snakes and plants indigenous to the area.
- Micromedex knowledge also helped the World Health Organization's International Programme on Chemical Safety to diagnose and treat the victims of the Wakayama, Japan arsenic poisonings.
- Over 500 physicians, pharmacists, and other healthcare experts from leading universities, such as Harvard and Stanford, make up the Micromedex editorial board that reviews this content. With a staff of 400, one quarter of whom are medical writers and editors, Micromedex reviews the world's literature every day.

Mr. Chairman, competent, comprehensive medical information in the hands of our nation's emergency responders and public health care providers can strongly improve the safety and effectiveness of any response to a biological event that may, in the future, be required. I hope that the members of this committee can support out efforts to put this knowledge in the hands of these individuals and entities.

Finally, Mr. Chairman, Micromedex is proud of its corporate good citizenship. Our parent organization, the Thomson Corporation, has already pledged $5 million to World Trade Center relief efforts and to assist the families and loved ones of victims.

I appreciate this opportunity to testify before the Committee and I would be pleased to answer any questions that you may have.

Mr. BURTON. You know, this isn't the first time that we have held hearings where our health agencies testify and then we have another panel testify, and it's like you are talking to two different worlds. The health agencies indicate that there's one train of thought, one line of reasoning as far as dealing with epidemics or terrorist attacks like the anthrax scare, and then you talk to people like yourselves and you get a different perspective, that there are other possible approaches or complementary therapies that can be used in conjunction with those to save lives.

So I would like to start off with a general question, and that is, start with you, Dr. Jonas, why is there this attitude at our health agencies that there is only one approach to use the antibiotics, and when you are talking about complementary or homeopathic or alternative therapies, that they are untried, untrue and unproven, and they really don't have any desire to go ahead and research those?

Dr. JONAS. Well, sir, I have sat on both sides prior and this is the first time I sat on as a nongovernmental representative, and I think there are a couple of reasons. No. 1, when you are tagged as being someone whose primary duty is to protect the public health, then you take an ultraconservative approach and require—or I think a more extensive data base before one would make a public announcement that something is useful for fear that your remarks might be taken out of context and that they generate things that others would criticize.

I think there is a deeper reason, however and that has to do with belief. Montaigne said 500 years ago that there's nothing so firmly believed as that which is least known. And I think in these areas, a lot of the information is not known, even by our public health officials. So we get individuals who believe in complementary medicines and believe so strongly that they are willing to promote them without evidence, and then we get individuals who believe so much against them that they are not willing to look at the evidence in an open-minded way. Unfortunately, most of the support comes from the more conservative, the latter side, and so the investment then in research to try to get that information isn't forthcoming.

But I think faith and belief supplanting science and rationale is the underlying cause, and that is not a judgment, sir, that is an observation.

Mr. BURTON. How do you bridge that kind of gap, because, you know, there are things that have been accomplished and proven over time that the conventional belief wouldn't listen to. And I guess maybe this is an age-old question. I think Pasteur faced the same thing in his day and age when he talked about vaccinations and cleanliness and surgery and so forth. And it gets very frustrating here especially when you are looking at a possible terrorist threat against the United States and limited resources to deal with some of those terrorist threats should they occur. If we had a smallpox epidemic right now, we would be limited to 12 to 15 million vaccinations. What would we do with the other 230 some million people in this country? I mean, if there are complementary and alternative therapies that could be used to save a lot of those lives—maybe not a large percentage of those—how do we get that message across?

And I know this is a general question, and it's not really scientific-related, but I am frustrated, quite frankly, because we have had these hearings time and time and time again, and it seems there is a narrow approach by our health agencies, and when you talk to others in the alternative and complementary therapies and homeopathic therapies, they have a different view. And to get them together so we can all work together to make sure that we have the best approach to solving these problems is just like breaking down a wall with your fist.

Dr. JONAS. Right. I think that the government can play a large role in this. I think an example is the Office of Alternative Medicine and now the National Center for Complementary and Alternative Medicine.

Mr. BURTON. Let me interrupt. The gentleman who is here from the Office of Alternative and Complementary Medicine—I don't know if you listened to him or not, but his attitude is very much like the rest of the attitudes at CDC and FDA. I mean, he's got a very conservative view on complementary and alternative therapies. And when you talk about testing some of these things, they don't do it.

Dr. JONAS. Wouldn't you agree, Mr. Chairman, that they are doing more than they would have without such an office? I think that certainly is advancing the field.

I agree with you that we need a more open attitude. I experienced a number of the pressures that he's going through right now and how to deal with them, but I tried to maintain an open attitude to a variety of possibilities and not simply cut things off because I didn't think they were plausible, but to actually look at the evidence. I think one way to do that is to make sure that practitioners who had experiences in these areas are an integral part of guiding those types of offices and actually work in those types of offices. I think that is one thing that could help.

Mr. BURTON. In other words, having some people on the advisory boards and so forth who are having input into the leadership of those agencies so that they will look at those alternatives.

Dr. JONAS. I think that is one approach, and also having individuals in those offices who have those types of attitudes who are interested in that. You wouldn't ask an orthopedic surgeon to run an office who was doing pediatric research. You need to have individuals that are widely supportive and widely knowledgeable about the areas actually in charge of those places.

Mr. BURTON. I will try to get ahold of Secretary Thompson and ask that that be done. Remind me to do that.

Comment?

Dr. MCDANIEL. I think Dr. Jonas hit the nail on the head and pretty well summarized it. In some ways I think of myself as almost an anarchist about freedom until I was elected to be an official down in Austin for 2½ years, and all of a sudden fiduciary responsibility for people that I don't even know, and the all the variations that may be in the formula, you get more personally involved when you see them and you know what they are and you are in a situation and you feel the pressure of it.

Even when I was hearing the officials speak during the early phases of the AIDS epidemic, I was amazed at how bending and

yielding the FDA could be under crises and panic, and even found out and told me, "You could have an individual physician—I indeed attest this—and you can start next week." So I was really amazed because FDA gets nothing but hell and criticism, and some of it is well founded because human beings like power and protection, but they are also responsible for the regulation of poisons that get elevated to the status of drugs. If you and I were responsible for that, we would be very conservative, too. And if anybody doubts that, look at how many drugs have been pulled off the market in the last 10 years after years and millions of dollars of development, and they had to be pulled off. They are responsible to the public to have something safe and effective.

Another thing is about—as Dr. Jonas hit about belief, I have found that people are very religious in terms of developing the idea and it is right, and everybody else is wrong, and we all got together, this is canonized and acceptable and we followed that. And I call that the dark side of this equation. But on the other light side, human beings can be very spiritual and understanding and forgiving and will take actions and break the laws and all the regulations when it calls for it, but they usually want really good substantiation even as an administrator in the government, but they don't like to do it because they are held responsible for it.

I was thinking about the vaccine. If they turned something loose, like a drug, and it works before they've done all the regulatory tasks, they are heroes, but if it doesn't, who gets drawn and quartered?

Mr. BURTON. I understand.

That was a great defense for the FDA that you just made. It doesn't alter the fact that there are alternative and complementary therapies out there that are not being thoroughly investigated, and you wonder why, because not only are they having a different viewpoint, but there's not a lot of investigation or clinical studies being done on alternatives that ought to be done.

Dr. MCDANIEL. It takes a lot of money to do studies. I have been trying to move up the ladder. Dr. Straus gave an excellent interview in the JAMA—two pages. He called this pioneer medicine, and you start with anecdotals, and you get case series, and you work your way up. Once you get past case series, you start getting into $500,000 to $1.2 million just like that. And this is very demanding and difficult. And I was taught, and the scientists that have been here, "Where is your double-blind placebo random-assigned crossover?" But on the other hand, just in the last year, the number of physicians and even faculty members that all of a sudden wanted to know more about this, and I couldn't imagine some of the hell I have been through for pursuing this path off the beaten path, why they were showing such interest, and their statement was, "Helped my little boy." "My daughter's surgery was canceled." "My wife is alive." One patient was all it took to change their attitude when they saw it themselves.

Mr. BURTON. Well, therein, as Shakespeare said, lies the rub. Do any of the other gentlemen have a comment on that?

Dr. GORBACH. I am a NIH success story. I have been funded continuously for 35 years, and most of my salary is paid by the NIH, so I work for the government. I have five NIH grants, but when

I put in grants—I put in three now for probiotics—they always get turned down. So I get well-funded for my other research, which is on nutrition and HIV, but the review panels just don't believe in anything that isn't straight party-line conventional therapy. Even if you present a study which is very well designed in order to prove efficiency, they don't acknowledge the first step that there may be some worth to exploring the question. So I think it is a problem with the study sessions of the NIH.

Tomorrow, I am going to a study session at the NIH. I serve on a study session, but my colleagues just don't believe in this type of medicine. I have to put a different hat on when I go to the NIH, because I can't talk about probiotics. They won't accept it.

I think the way to deal with this, Mr. Chairman, is that if the NIH puts out what they call an RFA, if they have a request for an application, in which that is the program that they want to study, whether it is probiotics, homeopathy or the carbohydrate, then the study session has to deal with the applications, and they must give out the money that is allocated. But if you put it into the general study sections, these applications, I find, they just get cut up and slaughtered.

Mr. BURTON. Well, if you have suggestions, because you are on the side that's looking at new approaches to dealing with major problems in our health area—if you have suggestions, I'd wish you submit those to me in writing, and we will pursue them with the agencies and with the Secretary of HHS. This is a time that we've never experienced before where we have terrorist attacks and terrorist threats on the United States of America, and while we want to make sure that we have the best science and the best medicine, we want to make sure that we get to the bottom of it as quickly as possible so we can protect the largest number of people. And if there is a cemented mental attitude about research in any of the agencies, we got to break through that so we get as much bang for the buck and as many results as we possibly can.

So if you have suggestions—and I hope I am making myself clear the way I am expressing myself—if you have some suggestions on how we can get that done, I would like to know what they are, and I will talk to the Secretary about that.

Dr. KLASCO. Mr. Chairman, much of our discussion today focused on the use of complementary or alternative therapies as an adjunct to stretch otherwise constrained resources to meet the needs of 240 million people. We talked about diluting vaccines in order to make a limited supply meet the needs of our country, and we have talked about many other agents.

I think one of the most important ways that we can stretch our limited resources to meet our needs is to take the information that we already possess, put it in the hands of those people who are going to be on the front lines, and empower them to use our resources wisely, empower them to use our resources for people who are actually exposed or actually infected, and to spare the use of precious resources for those people who turn out not to be infected.

Mr. BURTON. Your comment in your opening statement was not lost upon me, and I understand that you would like to have this information that you produce given to the various agencies around the country so that there is real quick access to it in the event of

an emergency, and we will see if we can figure out a way to make sure that is done. So I want to make sure we followup on that.

I know you have been here a long time, and I don't want to prolong this, but there are a few questions I would like to ask. Let me start with Dr. Jonas.

Homeopathy has been used around the world for some time. Can you explain how it's used and the success rate in a generic sense?

Dr. JONAS. We have looked at this in quite detail. It's used, as you say, all around the world for a variety of conditions. We published a med-analysis of all the clinical research that was done in homeopathy in 1997 in the Lancet, and the amount of research, unfortunately, wasn't large enough to say that we can identify a specific condition in which it has been proven safe and effective.

Subsequent to that there has been additional research that I mentioned in my testimony that has demonstrated that, but the overall effects did show that it was effective, about twice as effective as placebo on average in the clinical studies.

Mr. BURTON. Well, if it's twice as effective as placebo on average, then it would have a positive impact on those who did not benefit from other forms of prevention.

Dr. JONAS. Yes. There were two other similar summaries of the studies that came to similar conclusions, one did not, and there has been criticism about the statistics and the statistical approaches on that from the conventional community saying that it is not adequate evidence.

Mr. BURTON. So there is inconsistencies, and so they are not going to pursue any studies on that?

Dr. JONAS. Well, they are pursuing some studies of it. I have a couple of NIH grants, and actually there are two or three other NIH grants that I know of specifically on homeopathy, and there is currently an RFA out in which they did put experts in the area of homeopathy on the review panel, and it's currently under review. That potentially could fund a center in these areas as well as other frontier areas. So there is some money being put into it.

Mr. BURTON. You talked about digital biology. Can you explain a little bit more about that and its potential applications?

Dr. JONAS. Digital biology is a concept that has been really developed by a French researcher by the name of Jacques Benveniste who claims he has been able to digitize biological signals and record them on a computer and then deliver them through an electromagnetic frequency off of a wave file and reproduce those digital effects. If this is true, and if this is something that could be developed, then it is a technology that possibly would allow us to detect agents as well as possibly deliver medical treatments in an electronic format. So it is an exciting procedure.

The Department of Defense actually is supporting some research in one of my labs to see if we can replicate some of those claims.

Mr. BURTON. How about our health agencies, are they doing anything on this?

Dr. JONAS. The only support of this that I know of is from DARPA, the Defense Advanced Research Products Agency, which funds what they consider out-of-the-box types of things. This is one of those things that I wouldn't dare submit to a NIH review group. It wouldn't even get the time of day.

Mr. BURTON. It sounds like it is an exciting research project.

Dr. JONAS. It's what's called a high impact, high risk. That's the terminology that's used. I mean high risk in the sense that if you find nothing, you have wasted your money. But high impact, if you find something, it will revolutionize medicine.

Mr. BURTON. Do you think the White House needs a senior domestic policy advisory on complementary medicine to coordinate the OAM issues worldwide and governmentwide?

Dr. JONAS. Yes, I do, sir, and we are actually discussing this on the White House commission.

Mr. BURTON. You are on the commission?

Dr. JONAS. I am on the White House Commission for Complementary Medicine, yes, and I do believe something like this is needed. You only have to look to the success of the OAM and the National Center for Complementary Medicine in terms of the stimulus that they have provided in the research area.

There are many things that need to be done if we are going to properly integrate complementary medicine into our healthcare system, including education, licensing, technology transfer, business issues, and a senior-level effort in those areas I think could go a long way toward moving that forward.

Mr. BURTON. Is your advisory panel going to make that recommendation to the——

Dr. JONAS. I can't speak for them right now. It is under discussion, but it is one of the considerations, one of the things they are strongly considering, yes, sir.

Mr. BURTON. How many people are on that advisory panel?

Dr. JONAS. There are I think 16. Has it increased—16 or 17.

Mr. BURTON. Well, if you need assistance in making that recommendation to the President and the White House, I'll be glad to work with you on that. So if you'll let me know, we could send a note over there to the——

Dr. JONAS. Thank you very much. As we get closer, I'll let you know that.

Mr. BURTON. OK. Dr. McDaniel, how does the public find good information about micronutrients, and is the government providing this information?

Dr. MCDANIEL. Well, it's available on various search engines. In fact, Acta Anatomica, Volume 161–1998, out of Switzerland, points out that with a MEDLAR search—I think that comes out of the national library—that in that year alone, there were over 20,000 journal articles published worldwide on glycobiology, glyconutrition, glycoscience with a MEDLAR search, and it doesn't require the government to disseminate everything or do everything. I think this is a private company that is doing the technology that we talked about. But where the problem is in some of these out-of-the-box things is being able to get the funds to do the research to get the type of evidence base, because the funds are limited even for all of the drug studies. We've got 20,000 journals in the world, and we still haven't got all the drug studies done in a century. And here you come up with something else outside the box. It just doesn't get funded, as Dr. Gorbach said about, and I was sitting here feeling—I got into all of this. I was taught all the same things that—of the men that preceded us and the ladies then, and I found

out that prebiotics or probiotics were very important, and I think after nutrition and the role it plays in health and disease, that the flora in our bowel and what it contributes to health and disease is going to be another very common economical approach. As an addition to energy, I would call what you were talking about, which is as old as Oriental medicine, and we're just applying it in a more technical, modern——

Mr. BURTON. I see Dr. Jonas grabbing for the mic there.

Dr. JONAS. Sir, I just want to say that we shouldn't be thinking that the government should be funding all of this research. It is very expensive——

Mr. BURTON. No, no. I don't think anybody has indicated that the government should be funding it, but it seems like there's roadblocks to some of this research.

Dr. JONAS. There are roadblocks, and one of the major roadblocks is that there are currently few incentives for the private sector to move into this area. The current patent structure, the current tax incentives and these types of things result in a very large amount of money going into standard medical technologies and drugs and this type of thing.

Mr. BURTON. Do you have recommendations on how that could be changed?

Dr. JONAS. Well, I think that should be looked at. I think we should look at patent laws in terms of the relation to natural products, and how can we incentivize the private sector to begin to invest in this. I think we should look at the FDA regulations to create a category that will allow for approval of products so that they don't have to spend $250 million for a drug classification that they may not recover or tax incentives that then would incentivize the private sector to move into these areas.

Mr. BURTON. Let me just tell you that Members of Congress—we have 40 some members on this committee. Do you see how many is here right now? My colleague from Ohio and I. But the thing is we have so many things on our plate, that we can't concentrate—there are few people who have concentrated on what we're talking about here today, and what we need from you folks is recommendations on how we can cut through the logjam and solve the problem. So if you have suggestions, I implore you to give those to us. If it's a change in our patent laws or a suggested change or a suggested change in how research is done on nutrients so that it's more cost effective and could be done in the private sector or if it's a tax incentive for people to invest in new technologies and new methodologies, we'd like to have those, and we can make those suggestions.

Dr. JONAS. In March 2002, the White House Commission will be providing you with a number of specific suggestions in those——

Mr. BURTON. Well, I'll look forward to that. Yes, sir?

Dr. MCDANIEL. I wanted to also mention another thing that I do think is an area of government that—in response to your first question. It is the hesitancy of people to get outside the box or out of standard practice of medicine because of exposure to litigation. If it works—but if it doesn't work—and nothing works 100 percent of the time—the exposure ends in——

Mr. BURTON. Malpractice.

Dr. MCDANIEL [continuing]. Malpractice insurance, and they won't even cover you if you're doing it. I know a practitioner in Texas that got involved with some of this energy flow-type thing, and he had to appear before the State Board of Medical Examiners. We've had a number of incidences that I've been involved in after DSHEA was passed that physicians, very frustrated with patients with chronic unresponsive conditions, found out through their patients and their own self-administration, "Hey, this works." And they tried it and another—the next thing they knew, they were turned in by their peers and are appearing before the State Board of Medical Examiners. I happen to be one of those, turned in by no less than the dean of my own medical school to defend my license for doing this work. They found out, surprise, that I had an FDA individual exemption to do research on it, and I had never charged a patient a dime, which kind of tilted the machine. But if I hadn't have had those, I would be in deep you know what.

Mr. BURTON. Well, I think I understand that. These glyconutrients that you're talking about, you know, you can't make a medical claim on those, because if you do, then of course there's another avenue that has to be pursued and you could be held responsible. So you don't make those claims. But I know in your opinion, you think they really help with a lot of medical problems.

Dr. MCDANIEL. I will put it this way. The glyconutrients do not treat, cure or mitigate any disease. They give the body, under the control of genes, what the cells need——

Mr. BURTON. I understand.

Dr. MCDANIEL [continuing]. To do normal structured and function. It is not normal to be sick.

Mr. BURTON. I understand.

Mr. LaTourette, do you have any questions?

Mr. LATOURETTE. I do, but I can wait until you're done.

Mr. BURTON. I'll be through here in just 1 second. I only have two more questions and then I'll yield to my colleague.

Mr. LATOURETTE. Patience is a virtue.

Mr. BURTON. OK.

How much training do doctors get in medical school about biological warfare and terrorism?

Dr. KLASCO. Very little. At least during my time in medical school, anthrax was an esoteric disease of slaughterhouse workers. So there's a real gap. There's a knowledge gap. But the knowledge fortunately exists. We just need to get it out into the hands of the responders.

Mr. BURTON. The gentleman from Ohio.

Mr. LATOURETTE. Thank you, Mr. Chairman, and I won't take long. I appreciate all you gentlemen coming here today, and I appreciate the fact that the chairman has these hearings on alternative methods of looking at things. We hear from the CDC and a lot of other people that do wonderful work, but I can remember a hearing that the chairman had last year on autism and some research relative to whether or not the early childhood vaccinations may be contributing to things in a way that people—that everybody to be vaccinated as early as possible didn't want to hear, and I find it to be elucidating. And I don't know whether it was you, Dr. McDaniel, or you, Dr. Gorbach, that said that sometimes one of

these cures, it's my child—I can remember when Dr. Gorbach was going over the antibiotics, our—my first child had horrible ear infections, and we went through ampicillin, amoxycillin, Ceclor, and the ear kept oozing. And finally some wonderful pediatrician came out with a couple needles that looked like you would give it to a horse and said, we're going to fill this with gamma globulin, and I didn't think that this was going to be—and apparently it was that—the introduction of gamma globulin—and I think as I'm hearing you, Dr. McDaniel, talking about glyconutrients—gave the body the ability to not be sick, and then she's been fine ever since.

Dr. Jonas, I am not as smart or well versed as the chairman is on many subjects, and if you don't believe me, you can just ask him later, but I read your testimony about homeopathy, and I guess I'm a little unclear. I read your observations about influenza breakouts and other things from previous centuries. Can you just describe for me in general—I understood taking a small amount of medicine and inserting it—is it similar to an inoculation where you take a portion of the disease and reinsert it back into the person to build-up an immunity, or is it something else?

Dr. JONAS. I guess you could say it is similar to that, yes. However, instead of focusing on a particular peptide, as you would in an inoculation where you're trying to get the immune system to produce a specific antibody, what you're trying to do is match the stimulus, the homeopathic remedy, in a global fashion, with the entire person's response so that they get an overall healing response. So it's the level of focus in which you have it. You can use it, apparently, at the level, like you might for a particular infectious agent, and that's done in a number of countries. But the classical homeopathic approach is really an attempt to give the body a particular signal, a particular energetic stimuli, that it responds completely, so it responds both mentally and physically. And there's a very special matching process that goes on for those that practice that type of classical homeopathy.

But the analogy is very similar to a vaccine or very similar to a toxin, in which if you take a little bit of the toxin, you develop a tolerance for it, so that if you then get a higher level of that toxin as a stressor, you'll be able to respond to it.

Mr. LATOURETTE. Can you give me an example of what was used for influenza, for instance, what was the homeopathic remedy?

Dr. JONAS. Yes. For example, there's usually about four or five remedies that are used for influenza, depending upon the symptoms. If someone had a type of headache in which they were not able to move, they just had to lay on the bed but they were very thirsty, then that matched the symptoms of a particular remedy called baptisia, which when they had given it to healthy people produced those kinds of symptoms. So that type of an influenza would respond to baptisia.

If someone had a completely different type, if they were not thirsty, for example, but were crying all the time for some reason—sometimes that happens—had aches down a part of their spine, that corresponds to tests that have been done with pulsatilla in healthy people, which is another plant product, and they would get that remedy.

Mr. LATOURETTE. Got you. Thank you very much.

Dr. Gorbach, you were talking about probiotics and particularly the LGG that you were most familiar with. You indicated that the news is encouraging on probiotics, but the studies I think you indicated were as a result of pediatric studies and they were 7 to 10-day courses for Cecor or amoxycillin and those matters. And I think I heard you say that there's a need for a clinical trial to determine whether or not probiotics can be effective in fighting off some of the—or diminishing the side effects from Cipro. Are any clinical studies underway that you're aware of?

Dr. GORBACH. No. No clinical studies underway.

Mr. LATOURETTE. And is that because of the reluctance of NIH and others to—I mean, have you submitted such a thing saying that, hey, I've got this great stuff?

Dr. GORBACH. Well, I'll have to say we've only been in this current crisis for a matter of weeks. It takes a few months even to put together an NIH application. But besides that, I personally am not doing research on this. It's a conflict of interest for me, because I am an investigator, but in this case I own the patent on it, so I rather encourage other people from universities to do the research where I don't have a conflict of interest, and I would hope that this issue of antibiotic side effects with Cipro would become important enough for others to submit applications and do research.

I help a lot of investigators, about 30 around the world, who are doing research in various aspects, by giving advice, but I don't feel it proper to do research of my own product itself.

Mr. LATOURETTE. Got you.

Dr. GORBACH. So I hope someone else does it.

Mr. LATOURETTE. Well, I do, too, to tell you the truth.

And then, Dr. Klasco, you made observations about the preservation of scarce resources, and anthrax is a pretty big deal around Capitol Hill because of what happened at the Ford Building and the Hart Building and other places. And there's been sort of—even though Bayer has been, you know, kind enough—I don't know if that's the right word, but they've slashed their prices and others have indicated you can take these antibiotics, there's a great deal of concern, and so you have a lot of people taking 60-day courses of Cipro that probably shouldn't be taking 60-day courses of Cipro.

The advice that has been generated by the Bush administration and also by the Attending Physician here at the Capitol is that unless you've been exposed don't run out to the drugstore and hog up everybody's Cipro, one, because it's a scarce resource, and, two, it may do you harm through some of the side effects that Dr. Gorbach has been talking about.

Does everyone agree with that prudent approach by both the administration and our Attending Physician?

Dr. GORBACH. Everyone agrees, except if you're exposed.

Mr. LATOURETTE. Right.

Dr. GORBACH. And then it's very difficult to persuade a postal worker that he or she shouldn't take Cipro. So it's a very difficult position for the physicians, the health authorities to make that call, but the general view—I think it's been rather conservative—do not give Cipro unless there's an indication. I know as a physician I'm getting a lot of phone calls from my patients to stock up on Cipro, and I have refused to write any scripts. And the recommendations

now that we're giving and teaching to the community of physicians is if you have someone with a potential exposure, do not write a script yourself, but consult with the authorities to see if that person in fact has a legitimate exposure, because otherwise—I mean, we're already giving 32,000 courses of Cipro. But it could get even worse.

Mr. LATOURETTE. Right. Dr. Klasco, is there something you wanted to say relative to that?

Dr. KLASCO. I agree with the way Dr. Gorbach just phrased things. I would differ in one slight regard, in that health care providers shouldn't have to look to a central authority to guide their patient care decisions. They should be armed with the tools that they need so that their knowledge, expertise and training can make an informed decision in the setting of a patient care experience.

Mr. LATOURETTE. Thank you. And Dr. McDaniel, last to you, like homeopathy, I'm not real familiar with glyconutrients and, as I understand it, they are sugar-based nutrients and I think in your testimony you said it was heresy to suggest such things would be beneficial in the past. And, I mean, is that rooted in the fact that your mom said you shouldn't be eating a lot of candy, I suppose, but I don't know that's an oversimplification. But is the basic tenet of your research on glyconutrients is if you increase the body's levels, it brings you to a point where you don't have to—not that you don't have to worry about it, but your body is better able to deal with infection and you don't get sick. Is that where you are?

Dr. MCDANIEL. Except that you don't eat more candy.

Mr. LATOURETTE. I understand that.

Dr. MCDANIEL. They are sugars that aren't sweet. And actually the business end of antibodies, the variable-end that matches up are written in sugars. Who we are and the reason we can't take a transplant from anyone other than an identical twin is written on the surface of our cells in sugars. But in the packet, you see there that the head of immunology and allergy at the University of Health Science Center in Houston showed in mixed culture, followed by—that showed the cytokines which are, as I referred to them, little IBM cards, that the various cytokines that are made to be able to identify bacteria, yeast, tumor cells, viruses, go up on a dose-response basis. And then it follows through, there with the 4-hour cytolytic assay, that the natural killer cells that come out of this will punch holes in the virus-infected cells. And I presented a conference here in Washington that it will do the same to tumor cells. It puts holes in them. So these are used. But they're not complex—you know more about this problem than you think you do. I do a lot of lecturing. Everyone knows the difference in taste of vine-ripened tomatoes versus those picked green, shipped across the country, allowed to turn red; you take them home in great anticipation and they're tasteless red mush. We've plowed up our gardens, chopped down our orchards, insulted many of the things that have come to our table.

Our work started with aloe vera. Why have human beings been using aloe vera for over 5,000 years? And we found out with cooperation of work and a review done at Washington University in St. Louis that in the endoplasmic reticulum, you need nine mol-

ecules of the sugar that is in the aloe gel to start the synthesis of these cytokines, or the little IBM cards.

Why that is so important? We raise it by the tons in the rice patties of Louisiana and Texas, through the grain fields up to Canada, but on the way to our table, what do we get? White flour and white rice, and you strip that sugar out, making white flour and white rice, creating a deficiency such that when you add it back from the aloe plant, people say, "It's a miracle; look what happened." It is not a miracle. It is correcting the supply of sugars that are missing from our diet that we have to have, and that happens to be a very critical one in the endoplasmic reticulum.

Mr. LATOURETTE. Well, I thank you very much for that explanation, and, again, I thank you all for your work. I thank you for your testimony before the committee. And I guess I was more hopeful that I could leave here, Dr. McDaniel, and indicate to people that said that Dr. McDaniel has indicated I had to eat that extra Kitkat or whatever, but I appreciate your research very much. And thank you, Mr. Chairman.

Mr. BURTON. And I want you to know that there are very few areas where I have more knowledge than the gentleman from Ohio, except possibly in postal reform. We have a big difference of opinion on postal reform, which I'm sure would be of little interest to any of you.

Let me just end up by saying I really appreciate your being here, and I meant sincerely what I said, that if you have input that you'd like to give to us on—or suggestions on how to make things better for research in these homeopathic and alternative and complementary therapies, we would like to do it.

I would like to talk to you about getting this information to Mr. Thompson, and then I appreciate very much you being here. We stand adjourned.

[Whereupon, at 4:37 p.m., the committee was adjourned.]

[The prepared statement of Hon. Wm. Lacy Clay and additional information submitted for the hearing record follows:]

Statement of the Honorable William Lacy Clay before the Sub-committee on National Security Veterans Affairs and International Relations

"Comprehensive Medical Care of a Bioterrorism Exposure – Are We Making Evidence-Based Decisions? What Are the Research Needs?"

THANK YOU, MR. CHAIRMAN. I WELCOME THE OPPORTUNITY TO MEET WITH THE COMMITTEE TODAY. I THANK THE WITNESSES FOR BEING HERE TO SHARE THEIR KNOWLEDGE AND EXPERTISE. THE PURPOSE OF THE HEARING IS AMONG THE HIGHEST PRIORITIES THAT WE MAY HAVE AS A COUNTRY. WE HAVE TO EXAMINE THE FACTORS OF MEDICAL CARE THAT SHOULD BE CONSIDERED IN ASSESSING THE RISKS OF BIOLOGICAL TERRORISM ATTACKS IN THE UNITED STATES.

TO DATE, WE HAVE NO COMPREHENSIVE ASSESSMENT OF THE THREATS POSED BY BIOLOGICAL WEAPONS. WE MUST NOT ASSUME ANSWERS UNTIL THESE ASSESSMENTS ARE COMPLETE. THE HEALTH OF THE CITIZENS OF THIS

COUNTRY DEPENDS ON THE ACCURACY OF THESE ASSESSMENTS AND RESULTING ANSWERS.

I LOOK FORWARD TO LEARNING AT THIS HEARING JUST HOW SAFE ARE THE VACCINES AND OTHER THERAPUETICS THAT ARE AVAILABLE FOR USE IN CHEMICAL OR BIOLOGICAL ATTACKS. ADDITIONALLY, I WOULD HOPE TO LEARN MORE ABOUT ALTERNATIVE TREATMENTS AND ANY NUTRITIONAL THERAPIES THAT ARE AVAILABLE AND EFFECTIVE IN THE TREATMENT OF THE EFFECTS OF A BIOLOGICAL ATTACK.

THE THREAT IS REAL. IT WILL REMAIN REAL FOR THE FORSEEABLE FUTURE. THE AMERICAN PEOPLE NEED BOTH PROCEDURES FOR DISTRIBUTING MEDICAL TREATMENTS AND THE KNOWLEDGE OF HOW TO IMPLEMENT THOSE PROCEDURES THAT ARE ESTABLISHED. WE MUST MAKE SURE THAT OUR RESEARCH NEEDS ARE GIVEN TOP PRIORITY.

MR. CHAIRMAN, I ASK UNANIMOUS CONSENT TO PLACE MY STATEMENT INTO THE RECORD.

Illinois Vaccine Awareness Coalition (IVAC)
P.O.Box 946, Oak Park, IL 60303
Barbara Alexander Mullarkey, spokeswoman 708-848-0116
Mary Gorski, membership 708-442-5915
Connie Roux, regional coordinator 217-355-6506
www.vaccineawareness.org

28 November 2001

Rep. Dan Burton
c/o Beth Clay
FAX: 202-226-1274

Re: "Comprehensive Medical Care for Bioterrorism Exposure--Are We Making Evidence-Based Decisions? What Are Research Needs?"

Thank you for convening this hearing. Illinois Vaccine Awareness Coalition members agree with your three themes:

-We must think outside the box.
-We must work together.
-Information is power.

Contrast the testimonies of Wayne B. Jonas, M.D., NIH's director of the Office of Alternative Medicine (1995-1999) and that of present director Stephen E. Strauss, M.D.

Dr. Jonas' investigation of homeopathy data, electronic detection and neutralization of infectious and toxic agents, light therapy, ozone, and friendly bacteria signals cutting edge research.

On the other hand, Dr. Strauss reflects "medical business as usual" when he insists on "an unwavering trust in the currently approved drugs and vaccines." With his attitude of negativity toward natural remedies, why is he the director of NIH's National Center for Complimentary and Alternative Medicine?

For our children's sake,

Barbara

Barbara Alexander Mullarkey, spokeswoman

P.S. Please include this letter in the hearing record.