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PARKINSON'S DISEASE RESEARCH AND TREATMENT

HEARING
BEFORE A
SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE
ONE HUNDRED SIXTH CONGRESS
FIRST SESSION

SPECIAL HEARING

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PARKINSON'S DISEASE RESEARCH AND TREATMENT

TUESDAY, SEPTEMBER 28, 1999

U.S. SENATE,
SUBCOMMITTEE ON LABOR, HEALTH AND HUMAN
SERVICES, AND EDUCATION, AND RELATED AGENCIES,
COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9:40 a.m., in room SH-216, Hart Senate Office Building, Hon. Arlen Specter (chairman) presiding.
Present: Senators Specter, Cochran, Gorton, and Murray.
Also present: Senator Wellstone.

OPENING STATEMENT OF SENATOR ARLEN SPECTER

Senator SPECTER. Good morning, ladies and gentlemen. The hearing of the Appropriations Subcommittee on Labor, Health and Human Services, and Education will now proceed.

We have a hearing today which focuses on Parkinson's Disease. This is a medical problem of enormous impact. We have with us today a very distinguished panel, including Mr. Michael J. Fox.

One of the issues of developing public concern, public support, for research occurs in a very natural way, when someone of the prominence of Michael J. Fox comes forward and talks about his own situation. Senator Cochran, who has been the originator of the idea for this specialized hearing, and I, were just talking to Mr. Fox, who told us about his own personal reaction on going public, so to speak, of how he felt good this morning, with a sense of purpose, in coming to this hearing. Mr. Fox is one of thousands, tens of thousands, hundreds of thousands, of people in America who suffer from Parkinson's.

A very distinguished Pennsylvanian, Mr. Jim Cordy, will be with us today as a witness. Whenever I am in Pittsburgh, which is often, Mr. Cordy is by my side with an hourglass. He holds the hourglass up to demonstrate that time is fleeting. This subcommittee has been very active in increasing the funding for Parkinson's research, as part of our overall drive for funding of the National Institutes of Health.

Senator Harkin, who is the ranking Democrat, will be here shortly. But he and Senator Cochran and I and others have been working very hard to increase that funding. Last year, we added \$2 billion, which was unprecedented, to NIH funding.

I say frequently that the National Institutes of Health are the crown jewel of the Federal Government—perhaps the only jewel of the Federal Government.

We had a subcommittee markup yesterday and a full committee mark up today, and we go to the floor tomorrow. I said to Michael that this was a very unique time for him to be here, because we put \$2 billion additional in for NIH funding. The testimony which we had heard earlier—we will ask Dr. Fischbach about that today—is that we are within 5 years of conquering Parkinson's. While that is good, I do not think it is good enough, if we can do it faster. Because every day that we spend, it takes lives.

The Parkinson's issue is related to another very controversial matter, and that is stem cell research, which had a major breakthrough last year, last November, a veritable fountain of youth when stem cells can be substituted, posing enormous promise for Parkinson's and Alzheimer's and many, many other diseases. There is a prohibition on NIH funding being used for development of stem cells. In the bill, we have a provision to curtail that limitation, to have broader NIH funding, which we are going to defer action from this bill until February, because we want to pass this bill by Thursday night, the end of the fiscal year, September 30th.

That issue, which is going to require extensive debate, would preclude our effort to do that. So I talked to the Majority Leader, Senator Lott, who says that if we take it out and avoid the debate now, we will be able to have extensive hearings and have that debate on a freestanding bill next February. I do not like that, but it is the best that can be done under these circumstances. So that all of our efforts are being trained on this issue.

I have been asked to announce that the National Institute of Neurological Disorders and Stroke plans to support eight new Parkinson's Disease Centers of Excellence in fiscal year 1999, raising to 11 the number of funded Parkinson's centers, averaging about \$1.3 million each, and that the NIH has committed a total of \$73 million to Parkinson's Disease research for excellence, authorized by the Morris K. Udall Parkinson's Disease Research Act, which we included in our appropriations bill in fiscal year 1998.

Now, I am delighted to defer to my colleague, Senator Cochran.

OPENING STATEMENT OF SENATOR THAD COCHRAN

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

Let me thank you, first of all, for conducting the hearing, convening the hearing, with this outstanding panel of witnesses. We have an opportunity and an obligation. The opportunity is to achieve a cure of Parkinson's Disease. And we are told by experts that this is the most curable of the neurodegenerative diseases.

We have an obligation to fund this at a level as high as possible. The authorized level is our target. The Morris K. Udall Act creates that target. It emphasized the commitment of the Congress, when that Act was passed, to find a cure to improve the quality of life of those who suffer from Parkinson's Disease. We intend to carry out that mandate and that obligation.

We also have the example of Morris K. Udall, whom the chairman and I knew very well personally, and others from the Congress who suffered from this disease. Former Senator, the late Millward Simpson, of Wyoming, the father of Alan Simpson, our distinguished colleague, who is Assistant Leader of the Senate, was a victim of Parkinson's Disease.

In my State of Mississippi, one of my best friends, Noah Swett, a circuit judge, who was known around the country for his wit and wisdom, was also a victim of Parkinson's. There are many others. Celebrities like Michael J. Fox, members of Congress, judges, and many, many people throughout our country, whose names are not that well-known but who are just as important and should be just as important to this Congress.

So we are hopeful that this hearing will serve as a catalyst to give us information that can move this process along more rapidly. We thank you all for being here, and particularly for the medical researchers and physicians who are working so hard to make this dream come true.

Senator SPECTER. Thank you very much, Senator Cochran.

We now proceed to our first witness. He is the distinguished Director of the National Institute of Neurological Disorders and Stroke at NIH. Dr. Gerald Fischbach has been there since July of 1998. Before that, Dr. Fischbach was Chairman of the Neurobiology Departments at Washington University, Harvard Medical School and Massachusetts General Hospital. He is past President of the Society for Neuroscience and a member of the National Academy of Sciences.

STATEMENT OF GERALD D. FISCHBACH, M.D., DIRECTOR, NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE, NATIONAL INSTITUTES OF HEALTH, DEPARTMENT OF HEALTH AND HUMAN SERVICES

Senator SPECTER. Welcome, Dr. Fischbach. Thank you for your very productive work in this very important field. The floor is yours. We are going to set the clock at 5 minutes for each witness, which is our custom, to leave us the maximum amount of time for dialogue.

Dr. Fischbach.

Dr. FISCHBACH. Thank you, Senator Specter, for having this hearing. Thank you, Senator Cochran, for support of the hearing, as well. I wanted to thank Senator Harkin, as well, for your steadfast and wonderful support of biomedical science and the NIH budget.

I also want to acknowledge the many hundreds, actually, of physicians and scientists who have brought us to this point where we can speak optimistically about halting a neurodegenerative disorder like Parkinson's Disease, and where there is hope for many neurodegenerative disorders of all sorts—childhood, adult and in the aging population.

I want to start and give you a 30-second primer on Parkinson's Disease. This is a disorder that begins with a small group of cells deep in the brain. These cells make a neurotransmitter called dopamine. When these cells are lost, and dopamine is lost, the powerful action that dopamine exerts on brain circuits that control movement is lost. These circuits are inhibited, they are locked up, and smooth, coordinated movements suffer because of that.

In the past, Parkinson's Disease has been called a progressive disorder. I want to tell you some reasons why I personally am optimistic that we can change that. There is a chance to make real inroads in halting the steady progress of dopamine loss and the symptoms of Parkinson's Disease.

My reasons can be boiled down to three. One, we know a lot about these dopamine neurons. Two, we know how they die. Three, we have the wonderful appearance on the scene of stem cell biology, which offers a type of promise that is really unprecedented in the past 25 years of biomedical research.

These neurons, we know where they live. We know exactly where they are located. We know how they function. We know the circuits in which they are a part. This is the result of years of intensive study in animal models, subhuman primates and lower species.

We know the circuits well enough so that, using modern techniques of imaging and precise microelectrode recording, we can ablate parts of the circuit that are uncontrolled, that are firing inappropriately, which lead to inhibition of movement. Many of you have heard of the success, the partial success—hopefully the increasing success—of pallidotomy, to remove a region of the brain which is no longer controlled by dopamine.

There has been another really important advance, which is to insert electrodes deep in the brain and stimulate parts of the circuit that are deficient in Parkinson's Disease. This technique of deep brain stimulation may revolutionize the therapy of Parkinson's Disease. It says that the circuits are still there, even though the dopamine neurons have degenerated. They are there to be reawakened and to function once again. So I personally have great hope that NINDS, in collaboration with the VA and other institutes, is going to make a major effort in studies of deep brain stimulation.

Perhaps the most exciting advent is the appearance of stem cells on the scene. These are cells derived from the embryo, the fetus or the adult, which can proliferate, renew themselves and, on cue, can be made to differentiate into the cell that is needed. In the case of Parkinson's Disease, it has already been possible in animal models to place stem cells in the region of damage and to encourage them to produce dopamine and, remarkably, to cure, in these animal models, the movement disorder that is triggered by one of several experimental procedures.

We also know how these dopamine cells die. It turns out that nerve cells die in very few ways. There is a limited number of programs of cell death. It is a type of cell suicide. They do not die passively, but cells have to activate a suicide program. We know a lot about that program. It is activation of a cascade of enzymes, each one of which offers novel therapeutic targets.

Here is where Parkinson's Disease will benefit a number of other neurodegenerative disorders and will in turn benefit from them. Because it seems that cells die in Alzheimer's Disease and in ALS and in Huntington's Disease by exactly the same mechanism. Indeed, cells die in disorders that you would not ordinarily consider neurodegenerative, such as epilepsy, or depression, or any one of a number of childhood disorders. Once we understand this cascade better, perhaps, through studies of Parkinson's Disease, we will shed light on all of these disorders.

There are an enormous number of needs. I do not want to be overly optimistic. We must be able to detect this disease much earlier than we do. We must understand the environmental factors and the genetic factors that predispose people to the disease. We

need better animal models. We need better ways of delivering drugs to the brain. We need more knowledge of stem cell biology.

Now, much of this will be addressed through the Udall Centers that Senator Specter mentioned. I suspect that, altogether, we will bring about 200 new investigators into the field—counting students, junior faculty and the senior staff involved. If you have a chance to look through the list of projects in those centers, they touch on all the vital needs in Parkinson's Disease.

This path will be hard. It is going to take great effort by cooperation among all of the National Institutes of Health, cooperation with other agencies in the government, and especially cooperation hopefully through a public/private partnership with the very powerful and very wise advocacy groups for the patients.

PREPARED STATEMENT

We have to be targeted and we have to be broad. We have to allow for serendipity. Not everything is known. We must fund research that may have bearing on Parkinson's Disease in a very immediate and direct way. I agree with Louis Pasteur, who said that chance favors the prepared mind. Our job at the NIH is to prepare us constantly and as well as we possibly can.

Thanks.

Senator SPECTER. Thank you very much, Dr. Fischbach.
[The statement follows:]

PREPARED STATEMENT OF GERALD D. FISCHBACH, M.D.

Mr. Chairman and members of the committee, I am pleased to tell you what NIH is doing to reduce the burden of Parkinson's disease. I want to convey my enthusiasm and optimism. I also want to emphasize that the task before us, conquering Parkinson's disease, will not be easy. The problems ahead will challenge the insight and ingenuity of scientists and physicians throughout the country and require coordinated effort by several NIH Institutes working closely with private Parkinson's groups. Finding a cure for Parkinson's is not like sending a man to the moon or making the atom bomb, where a resolute effort to apply what is known produced success. We still need to learn a great deal before we can stop this disease, but I am encouraged that the pace of discovery is increasing each year, and that we are on the right track.

Parkinson's disease is a devastating, complex disease. Starkly put, Parkinson's destroys the ability to control movement. It begins with tremor and difficulty in initiating voluntary movements, and it progresses relentlessly, with a broad spectrum of symptoms, including depression and dementia in some patients. Nevertheless, there are several reasons for hope.

- At first, the degeneration of nerve cells is confined to one region of the brain and one type of nerve cell. These are nerve cells that normally transmit messages to other cells by releasing a chemical called dopamine. We are rapidly learning, down to the level of single molecules, how cells make dopamine and respond to it. Therefore the target early in disease is clear.
- A second reason for optimism is the discovery that nerve cells often follow a "final common path" to degeneration in Parkinson's disease and in many other disorders. Apoptosis, this death program, is often called "cell suicide" because cells participate in their own destruction by activating a cascade of enzymes that disrupt the integrity of genes and normal cell metabolism. Each step in the cascade offers new therapeutic targets to halt the progression.
- We have new insights about what damages nerve cells provoking the cell death pathway. Mechanisms such as free radical damage, malfunction of mitochondria (the cells' energy factories), "excitotoxicity" from excessive release of neurotransmitters, abnormal protein aggregates, and sudden elevations of calcium inside cells have been implicated. Again, each event offers opportunities to slow the damage caused by disease.
- Levodopa, when first introduced, seemed to be a miracle drug liberating Parkinson's patients from immobility. This drug helps replenish the brain's dimin-

ishing supply of dopamine. Unfortunately the effects of levodopa are not sufficiently lasting, side effects can be serious, and, most importantly, levodopa cannot halt the underlying death of nerve cells. It is encouraging that as we learn more about dopamine and other neurotransmitters in the brain, we are learning how to prolong and enhance the effects of levodopa and develop new drugs.

- Neurotrophic factors, an entirely new class of therapeutic drugs, were identified as natural brain chemicals that promote the growth and survival of nerve cells in the development of the nervous system. We are now learning how neurotrophic factors can be used to protect against neurodegeneration in adult brains, with promising results in animal models of Parkinson's disease.
- Years of analysis of the brain circuits that control movement are leading to dramatic advances in surgical repair of Parkinson's disease. Pallidotomy is a surgical procedure designed to rebalance the normal interplay of brain circuits that initiate and restrain voluntary movement. The procedure is now carried out with exquisite precision guided by advanced brain imaging and microelectrode recordings from single brain cells. An astounding new technology, chronic brain stimulation, involve electrodes implanted deep in the brain. Beyond relief of symptoms, chronic brain stimulation may even slow the progression of the disease. We must pursue this possibility and determine the long term consequences of these surgical procedures.
- Stem cells offer an entirely new therapeutic approach. Cell implantation offers hope for actually replacing nerve cells lost in Parkinson's and many other diseases. Clinical trials of fetal tissue transplantation, still underway, have developed methods for implanting cells into the brain, and demonstrated the viability of the concept and promising results for at least some patients. Now, neural stem cells, cells that have the capacity to renew themselves indefinitely and to specialize to form all cell types of the brain, offer a potentially unlimited supply of dopamine cells. Stem cell therapy has already produced dramatic success in animal models of Parkinson's and other neurological diseases.

Beyond the impact on Parkinson's disease itself, Parkinson's research will certainly lead to insights about many other diseases in which nerve cells die. Neurodegeneration—the death of nerve cells—is a ubiquitous problem. Most notable are the classic chronic neurodegenerative diseases such as Alzheimer's, Huntington's, and ALS. Many devastating neurodegenerative disorders also attack the brain of infants and children. Nerve cell death is critical in stroke, brain and spinal cord injury, and in epilepsy. Alcohol and drug abuse can cause neurodegeneration. Even severe depression, long thought to be related to a chemical imbalance in the brain, is associated with degeneration of nerve cells. The same destructive processes come into play and provoke the same cell death programs. Advances in Parkinson's disease will shed light on all of these disorders, and research on these other disorders may also advance understanding of Parkinson's disease.

Let me now focus on a few critical issues that must be resolved as we move forward.

- Early detection of Parkinson's disease is absolutely crucial. More than 75 percent of the dopamine cells have already died before the first symptoms are detected. Preventing cells from dying in the first place is the best hope for effective medical therapy. Extensive efforts to develop early detection of neurodegenerative diseases, though brain imaging and other approaches, are a major thrust of programs at the NINDS, the National Institute of Aging, and other components of NIH.
- Thorough epidemiological and environmental studies are essential to identify factors that set off the disease process. The National Institute of Environmental Health Sciences is leading a major NIH initiative to detect risk factors in the environment that may influence the onset or progression of neurodegeneration in Parkinson's disease.
- We must also follow the genetic trail. Though most people do not inherit Parkinson's disease, we can learn a great deal by studying the rare families that carry a Parkinson's disease gene. The first gene defect that causes Parkinson's disease, a mutation in the protein synuclein, was identified just three years ago, and two more Parkinson's genes have since been discovered. We already have clues that synuclein plays a role not only in familial Parkinson's disease but also in the more common non-inherited form. Synuclein may also play an important role in the development of Alzheimer's disease, again demonstrating the close ties among brain diseases.
- The advent of new surgical therapies, like deep brain stimulation, reinforces the importance of better understanding the brain circuits that control movement. If we understand the circuits perhaps we can reactivate them. Likewise, the more

we are learning about dopamine and other neurotransmitters the greater the options to restore motor control to Parkinson's patients.

- We are expanding our efforts in experimental therapeutics to keep the pipeline full of potential new treatments. Finding better animal models that truly mimic the slow neurodegeneration of human Parkinson's disease is critical to expediently move candidate therapies to human testing. This is one area where genetic technology may be essential. Other technologies, like high-throughput drug screening and gene arrays, promise to greatly expedite the search for cures and must be made accessible to any researcher with a good idea.
- We need to develop methods to deliver drugs to the brain. Many potentially therapeutic substances, such as neurotrophic factors, do not cross the blood-brain barrier which excludes substances from the general circulation.
- For no area of medicine is the promise of stem cells greater than for treating diseases of the human brain. We must learn how to control the survival, proliferation, and specialization of neural stem cells so we can repair the damage wrought by Parkinson's disease. The recent startling demonstration that even 60 year old human brains harbor stem cells presents the possibility that we may someday learn how to empower the Parkinson's ravaged brain to repair itself, if only we can learn the control signals.

In addition to the National Institute of Neurological Disorders and Stroke (NINDS), the National Institute of Aging, the National Institute of Mental Health, the National Institute of Environmental Health Sciences, the National Human Genome Research Institute, the National Institute on Drug Abuse, the National Institute of Diabetes and Digestive and Kidney Diseases, and the National Center for Research Resources all support research on Parkinson's disease. Led by NINDS, the Parkinson's Disease Coordinating Committee has undertaken several initiatives, including a major workshop in 1995 that identified new directions for Parkinson's disease research and a cooperative program announcement on "Mechanisms of Cell Death and Injury in Neurodegenerative Disorders."

Finally, as you have just heard, the NINDS has now funded 11 Morris K. Udall Parkinson's Disease Research Centers of Excellence. These centers will play a key role in coordinating and carrying out research efforts in Parkinson's disease. The centers will explore many aspects of Parkinson's disease, from basic science to clinical applications. They will play a particularly important role in bringing scientists and clinicians together to move research advance to therapy that can benefit patients.

We believe that current extensive efforts by the NIH in Parkinson's research are justified by the extraordinary opportunities that neuroscience research now presents for fighting this disease and the implications for other diseases. Because we know so much about Parkinson's, this disease can lead the way in confronting the broader problem of neurodegeneration. What we learn about the broader problem of neurodegeneration will also help in the fight against Parkinson's disease. We have an extraordinary opportunity and a great challenge. Neuroscience has arrived at a state when we can contemplate translating fundamental discoveries into a cure for seemingly inexorable neurodegenerative disorders. Thank you Mr. Chairman. I would be happy to answer any questions.

STAYING WITHIN THE CAPS

Senator SPECTER. We are facing a controversial appropriations bill because of the Balanced Budget Act. We are determined to stay within the caps. We have projected a budget which does that, but has substantial forward funding, which is a practice that the Congress has engaged in for many, many years.

If you would turn the green light on, we are going to take 5-minute rounds for everyone, including me.

The budget for our subcommittee is at \$91.7 billion, which is \$4 billion over last year. That is largely accounted for by the \$2 billion increase in NIH funding and the increases in education funding, again, where there is a consensus. We are going to have a problem on the floor of the Senate. We are going to have a bigger problem in conference with the House. We have to run through the raindrops in a hurricane to find something that is acceptable to the Congress and to the President to get this bill signed.

I think it is very important for America that we get a bill signed on appropriations on the two big priorities, health care and education. I think the American people are really sick and tired of the kind of partisan bickering that has come out of Washington for so long.

But a big help in persuading the Congress to accept this \$2 billion increase is to be as tangible as we can. Last year, we increased the funding by almost \$120 million, coming up to \$920 million. This year, the projection will make an increase again of that magnitude—\$120 million.

Now, what tangibly can you say will be accomplished on Parkinson's—or let me articulate the question a little differently—what tangibly was accomplished last year by this appropriation of \$920 million, almost a billion dollars, and the increase of \$120 million last year?

Dr. FISCHBACH. Well, in the area of Parkinson's Disease, we were able to fully fund the 11 centers. This all happened within a year—two review cycles. That was an extraordinary effort and a wonderful accomplishment.

Senator SPECTER. I do not want to cut you short, but the time is limited. Fine, for last year. Now, how about next year? If you get this \$120 million more, if we push you up to a billion, 20 million dollars, what will that increase in funding enable you to do?

Dr. FISCHBACH. I think it will enable us to pursue these efforts at the level we funded them. It will allow us to reach out to all neurodegenerative disorders and use what we learn there to focus on Parkinson's Disease. It will allow us to undertake expensive clinical trials, which we could not do now. It will allow us, I believe, to begin to contemplate a national effort, an epidemiologic effort, in cognitive health, which will identify early risk factors for the disease.

Senator SPECTER. The subcommittee has heard testimony earlier that I referred to briefly in my opening statement, that it is realistic to conquer Parkinson's within 5 years. Now that was about a year ago, so I guess it is 4 years now. A two-part question. Would you concur that we are that close to solving Parkinson's? Second, what could we do to even make it a shorter time interval to conquer Parkinson's?

Dr. FISCHBACH. I concur that we are close to solving—and I mean the word “solving”—Parkinson's Disease. I hesitate to put an actual year number on it. I think, with all the intensive effort, with a little bit of skill and luck, 5 to 10 years is not unrealistic. We will do everything possible to reduce that below 5 years. I would not rule that out.

Senator SPECTER. Well, will more money enable you to do it in less than 5 years?

Dr. FISCHBACH. I believe that we are doing a great deal now, in terms of clinical trials. We have to be concerned with the sanction and the ability of the community to undertake these efforts.

The advent of stem cells, the possibility of applying them aggressively in a variety of disorders will only be limited by the resources around the country.

Senator SPECTER. Will the elimination of the restriction on stem cells be a significant factor in expediting solving Parkinson's?

Dr. FISCHBACH. Yes, it certainly will. It absolutely will. If NIH-funded investigators can use stem cells, understand how to make them form dopamine neurons, ensure their survival in the brain, enhance the placement of those cells, it will certainly lead to a more rapid solution of those problems.

Senator SPECTER. Thank you very much, Dr. Fischbach.
Senator Cochran.

Senator COCHRAN. Thank you, Mr. Chairman.

Doctor, let me, first of all, thank you for your hard work in the effort to develop information, a full range of information, that will equip medical doctors and scientists to be more successful in the future in coming up with a cure and improving the quality of life for people who have Parkinson's.

Dr. Harold Varmus, who is not here today, the Director of NIH, is out of the country. We want the record to show that we appreciate his attention to this subject and his efforts to emphasize and improve the response that NIH is making to this challenge.

For some time, we were a little concerned, and I want to ask you about this, about how the score-keeping works at NIH. We appropriate money here and we identify areas of priority and concern, where we think emphasis ought to be placed by NIH, and then we are given a report that so much money has been spent in Parkinson's research or cancer research or some other disease research.

Some worry that there is a lot of overlapping, and that while we are trying to target funds for Parkinson's, we are seeing funds that are described as being used for Parkinson's, but may not be as specific to the disease as some in Congress would like. What is the response that you could give to those who worry about whether or not the score-keeping is accurate?

Dr. FISCHBACH. My response is that grading grants, rating them as to whether they are directly or indirectly relevant to a particular disorder is not an exact science. I am anxious personally to make this as precise as possible, and would like to work with all experts who have opinions about it. There are different opinions about it.

There was a concern raised 2 years ago about the relevance of the funds to Parkinson's. I personally, with senior members of the staff, reviewed our grants and tried to categorize them better than a slightly, admittedly, outdated system at the NIH. So I think we are on the right track. I look forward to working with all classes of opinion about the relevance of the grants. I think we can come as close as possible.

I am concerned about closing down the window of opportunity too narrowly. I think there are unknowns in Parkinson's Disease research. They may well be found in studies that are not directly related to Parkinson's Disease. This is all a matter of judgment that I think the community has to come to some consensus about and inform Congress about.

If you trace the history of discoveries, really fundamental discoveries in Parkinson's, not many of them were because the research was directly and immediately focused on Parkinson's Disease. I think we have arrived at the time in our history when we can focus money directly on this disease, given the advances we have in hand. But I think we need enough money to do both, to do the direct and do the relevant research, as well.

Senator COCHRAN. When Senator Hatfield was winding up his service here in the Senate, and particularly as chairman of the full committee on appropriations, he convened a series of hearings looking into how we could better use appropriated dollars to support the work that is done by the medical community and the research community in coming up with cures for illnesses generally. One of the things that we found out in those hearings was that fewer and fewer medical doctors and research scientists were going into the field.

What can we do here to encourage those who are the best and the brightest and have the capability of really finding the answers we need to solving these problems to devote a career to medical research, so that we will have the kind of talent and resource pool we need to carry out the work that you and others like you are doing?

Dr. FISCHBACH. I think that is something our Institute and our National Council struggle with every day. It is alarming that the number of talented young people going into biomedical research is declining. There is some hope in the last year that it may be on the upswing. But among the things we have thought about is to shorten the training period. We need to get people into the scientific work force before their late thirties, to increase stipends, to reduce medical school debt, and to make this type of career attractive by providing funds for them to continue their career.

Some would say it is just not acceptable for someone in their forties or fifties to have only a 25 percent chance of renewing their grant when they are doing good work. I think all the arrows are pointed in the right direction, and that adds to my optimism.

Senator COCHRAN. Thank you.

Senator SPECTER. Thank you very much, Senator Cochran.

One final question, Dr. Fischbach, before moving on to the next panel. That is that the Parkinson's Action Network has been concerned as to the utilization of funds. Senator Cochran touched on this. But let me put into the record their specific concerns, so that that will be before the public, and your specific response.

The assessment by the Parkinson's Action Network researchers found that 54 percent of the grant portfolio, they say, was not Parkinson's focused, and that 26 percent of the funding was spent on "research completely unrelated to Parkinson's." I think it is important for the record that you respond to that.

Dr. FISCHBACH. We have studied their report. We actually were shown the figures of the panel of 15 judges. We would be eager to work with that panel to try and rectify the disparities.

I would note that a significant fraction of that panel—I think it was 6 or 7 out of the 15—essentially agreed with our scoring. So there were two populations of judges on that panel, those who agreed were within 5 to 10 percent—some within 2 percent—of our figures, but a significant percentage, the remaining eight or nine judges, did not feel that our research was focused on or relevant to Parkinson's Disease.

My only response is that we are trying to reach some common ground. We offer and would welcome discussion, with no holds barred and with no animosity, with those judges to try and reach

a more rational agreement about what is and is not meritorious as directed to Parkinson's Disease.

Senator SPECTER. Well, I thank you for that response, and I commend you for your willingness to sit down and work with them to try to come to common ground. One of the difficulties that this subcommittee has and that I do personally is the tremendous number of requests from every organization—and there are many—in a variety of fields, wanting a bigger share, and many very unusual ailments.

So that people are understandably desperate to find a cure to their problem. That is one of the motivating factors that I find in trying to give you extra funds, so that you can tackle a broader range of problems. The allocation of funding is extremely difficult. But that is essentially a professional matter which the Congress leaves to the experts at the National Institutes of Health, as you see where the money can be most productively used, considering a wide variety of factors.

But I think it is very important, when people come to this subcommittee or to you, that we listen to them and try to accommodate their interests to the extent we can. If there is a challenge as to how the funds are being used, to try to analyze it and try to come to common ground.

Dr. FISCHBACH. We will.

Senator SPECTER. OK, thank you very much, Dr. Fischbach.

We turn now to our second panel, Mr. Michael J. Fox, Mr. James Cordy, Dr. J. William Langston, and Ms. Joan Samuelson.

If you, lady and gentlemen, would step forward, we will proceed with your testimony.

We welcome you all here. Ms. Samuelson is president of the Parkinson's Action Network and has been very active in promoting funding. Dr. Langston is the president of the Parkinson's Institute and a renowned expert in the field. Mr. James Cordy—where is your hourglass, Jim? OK—has been an extraordinarily effective advocate in this field.

As I noted earlier, we have with us today Mr. Michael J. Fox, a successful actor for many years. First, as Alex P. Keaton, on the television series "Family Ties." You always work with a middle initial, do not you Mr. Fox? Later in many movies, including "Back to the Future," and, most recently, on television again in the highly acclaimed "Spin City." Michael was diagnosed with Parkinson's in 1991, at the age of 30.

He has become very, very active in Parkinson's advocacy. One of the facts of life is that when someone like Michael J. Fox steps forward, it very heavily personalizes the problem, focuses a lot of public attention on it, and has the public understanding of the need for doing whatever we can as a country to conquer this disease and many, many others. So we thank you for being here, Michael J. Fox, and look forward to your testimony.

Again, we will put the lights on, for 5 minutes, on testimony.

Mr. Fox, we are going to start with you.

STATEMENT OF MICHAEL J. FOX, ACTOR

Mr. Fox. Mr. Chairman and members of the subcommittee, thank you for inviting me to testify today about the need for greater Federal investment in Parkinson's research.

Some, or perhaps all, of you, most of you, are familiar with me from my work in film and television. What I wish to speak to you about today has little or nothing to do with celebrity save for this brief reference. When I first spoke publicly about my 8 years of experience as a person with Parkinson's, many were surprised, in part, because of my age. Although 30 percent of all Parkinson's patients are under 50, and 20 percent are under 40, and that number is growing.

I had hidden my symptoms and struggles very well, through increasing amounts of medication, through surgery, and by employing the hundreds of little tricks and techniques a person with Parkinson's learns to mask his or her condition for as long as possible. While the changes in my life were profound and progress, I kept them to myself for a number of reasons—fear, denial for sure, but I also felt that it was important for me to quietly just soldier on.

When I did share my story, the response was overwhelming and deeply inspiring. I heard from thousands of Americans affected by Parkinson's, writing and calling to offer encouragement and to tell me of their experience. They spoke of pain, frustration, fear, and hope. Always hope.

What I understood very clearly is that the time for quietly soldiering on is through. The war against Parkinson's is a winnable war, and I have resolved to play a role in that victory. What celebrity has given me is the opportunity to raise the visibility of Parkinson's Disease and focus attention on the desperate need for more research dollars. While I am able, for the time being, to continue doing what I love best, others are not so fortunate.

These are doctors, teachers, policemen, nurses, and, as you had indicated earlier, legislators, and parents who are no longer able to work to provide for their families or to live out their dreams. The 1 million Americans living with Parkinson's want to beat this disease. So do the millions more Americans who have family members suffering from Parkinson's. But it will not happen until Congress adequately funds Parkinson's research.

For many people with Parkinson's, managing their disease is a full-time job. It is a constant balancing act. Too little medicine causes tremors and stiffness. Too much medicine produces uncontrollable movement and slurring. And far too often, Parkinson's patients wait and wait—as I am right now—for the medicines to kick in.

New investigational therapies have helped some people like me control symptoms but, in the end, we all face the same reality—the medicine stops working. For people living with Parkinson's, the status quo is not good enough. As I began to understand what research might promise for the future, I became hopeful that I would not face the terrible suffering so many with Parkinson's endure. But I was shocked and frustrated to learn the amount of funding for Parkinson's research is so meager.

Compared to the amount of Federal funding going to other diseases, research funding for Parkinson's lags far behind. In a coun-

try with a \$15 billion investment in medical research, we can and must do better.

At present, Parkinson's is inadequately funded, no matter how one cares to spend it. Meager funding means a continued lack of effective treatments, slower progress in understanding the cause of the disease, and little chance that a cure will come in time.

I applaud the steps you are taking to fulfill the promise of the Udall Parkinson's Research Act. But, we must be clear, we are not there yet.

If, however, an adequate investment is made, there is much to be hopeful for. We have a tremendous opportunity to close the gap for Parkinson's. We are learning more and more about this disease. The scientific community believes that with a significant investment into Parkinson's research, new discoveries and improved treatment strategies are close at hand. Many have called Parkinson's the most curable neurological disorder and the one expected to produce a breakthrough first.

Scientists tell me that a cure is possible—some say even by the end of the next decade—if the research dollars match the research opportunity.

Mr. Chairman, you and the members of the subcommittee have done so much to increase the investment in medical research in this country. I thank you for your vision. Most people do not know just how important this research is until they or someone in their family faces a serious illness. I know I did not.

The Parkinson's community strongly supports your efforts to double medical research funding. At the same time, I implore you to do more for people with Parkinson's. Take up Parkinson's as if your life depended on it. Increase funding for Parkinson's research by \$75 million over the current levels for the coming fiscal year. Make this a down payment for a fully funded Parkinson's research agenda. It will make Parkinson's nothing more than a footnote in medical textbooks.

I would like to close on a personal note. Today you will hear from, or have already heard from, more than a few experts in the fields of science, bookkeeping and other areas. I am an expert on only one—what it is like to be a young man, husband and father, with Parkinson's Disease.

With the help of daily medications and selective exertion, I can still perform my job, in my case, in a very public arena. I can still help out with the daily tasks and rituals involved in home life. But I do not kid myself—that will change. Physical and mental exhaustion will become more and more of a factor, as will increased rigidity, tremor and dyskinesia.

PREPARED STATEMENT

I can expect, in my forties, to face challenges most will not expect until their seventies or eighties, if ever. But with your help, and if we all do everything we can to eradicate this disease, in my fifties, I will be dancing at my children's weddings, and mine will be one of millions of happy stories.

Thank you for your time and attention.

Senator SPECTER. Thank you very much, Mr. Fox, for those very profound and moving words.

[The statement follows:]

PREPARED STATEMENT OF MICHAEL J. FOX

Mr. Chairman, Senator Harkin, and members of the Subcommittee—thank you for inviting me to testify today about the need for a greater federal investment in Parkinson's research. I would like to thank you, in particular, for your tremendous leadership in the fight to double funding for the National Institutes of Health.

Some, or perhaps most of you are familiar with me from 20 years of work in film and television. What I wish to speak to you about today has little or nothing to do with celebrity—save for this brief reference.

When I first spoke publicly about my 8 years of experience as a person with Parkinson's, many were surprised, in part because of my age (although 30 percent of all Parkinson's patients are under 50, and 20 percent are under 40, and that number is growing). I had hidden my symptoms and struggles very well, through increasing amounts of medication, through surgery, and by employing the hundreds of little tricks and techniques a person with Parkinson's learns to mask his or her condition for as long as possible.

While the changes in my life were profound and progressive, I kept them to myself for a number of reasons: fear, denial for sure, but I also felt that it was important for me to just quietly "soldier on."

When I did share my story, the response was overwhelming, humbling, and deeply inspiring. I heard from thousands of Americans affected by Parkinson's, writing and calling to offer encouragement and to tell me of their experience. They spoke of pain, frustration, fear and hope. Always hope.

What I understood very clearly is that the time for quietly "soldiering on" is through. The war against Parkinson's is a winnable war, and I am resolved to play a role in that victory.

What celebrity has given me is the opportunity to raise the visibility of Parkinson's disease and focus more attention on the desperate need for more research dollars. While I am able, for the time being, to continue to do what I love best, others are not so fortunate. There are doctors, teachers, policemen, nurses and parents who are no longer able to work, to provide for their families, and live out their dreams.

The one million Americans living with Parkinson's want to beat this disease. So do the millions more Americans who have family members suffering from Parkinson's. But it won't happen until Congress adequately funds Parkinson's research.

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For people living with Parkinson's, the status quo isn't good enough.

As I began to understand what research might promise for the future, I became hopeful I would not face the terrible suffering so many with Parkinson's endure. But I was shocked and frustrated to learn that the amount of funding for Parkinson's research is so meager. Compared with the amount of federal funding going to other diseases, research funding for Parkinson's lags far behind.

In a country with a \$15 billion investment in medical research we can and we must do better.

At present, Parkinson's is inadequately funded, no matter how one cares to spin it. Meager funding means a continued lack of effective treatments, slow progress in understanding the cause of the disease, and little chance that a cure will come in time. I applaud the steps we are taking to fulfill the promise of the Udall Parkinson's Research Act, but we must be clear—we aren't there yet.

If, however, an adequate investment is made, there is much to be hopeful for. We have a tremendous opportunity to close the gap for Parkinson's. We are learning more and more about this disease. The scientific community believes that with a significant investment in Parkinson's research, new discoveries and improved treatments strategies are close-at-hand. Many have called Parkinson's the most curable neurological disorder and the one expected to produce a breakthrough first. Scientists tell me that a cure is possible, some say even by the end of the next decade—if the research dollars match the research opportunity.

Mr. Chairman, you and the members of the Subcommittee have done so much to increase the investment in medical research in this country. I thank you for your vision. Most people don't know just how important this research is until they or someone in their family faces a serious illness. I know I didn't.

The Parkinson's community strongly supports your efforts to double medical research funding. At the same time, I implore you to do more for people with Parkinson's. Take up Parkinson's as if your life depended on it. Increase funding for Parkinson's research by \$75 million over current levels for the coming fiscal year. Make this a down payment for a fully funded Parkinson's research agenda that will make Parkinson's nothing more than a footnote in medical textbooks.

I would like to close on a personal note. Today you will hear from, or have already heard from, more than a few experts, in the fields of science, book-keeping and other areas. I am an expert in only one—what it is like to be a young man, husband, and father with Parkinson's disease. With the help of daily medication and selective exertion, I can still perform my job, in my case in a very public arena. I can still help out with the daily tasks and rituals involved in home life. But I don't kid myself . . . that will change. Physical and mental exhaustion will become more and more of a factor, as will increased rigidity, tremor and dyskinesia. I can expect in my 40s to face challenges most wouldn't expect until their 70s or 80s—if ever. But with your help, if we all do everything we can to eradicate this disease, in my 50s I'll be dancing at my children's weddings. And mine will be just one of millions of happy stories.

Thank you again for your time and attention.

STATEMENT OF JOAN I. SAMUELSON, PRESIDENT, PARKINSON'S ACTION NETWORK

Senator SPECTER. We turn now to Ms. Joan Samuelson, President of Parkinson's Action Network, an organization founded to support and encourage research and funding to produce an effective treatment and cure for the disease. She earned her degree at UCLA, an undergraduate and a law degree from the University of California at Berkeley, the founder of the Parkinson's Action Network, she has been President since 1991.

Thank you for your good work, Ms. Samuelson, and the floor is yours.

Ms. SAMUELSON. Thank you very much, Chairman Specter. Thanks so much to you and to Senator Cochran for your leadership on this issue. Thank you for your determination to add the additional \$2 billion to the NIH budget, to enable us to have adequate funding without robbing Peter to pay Paul. Thank you so much for this hearing, for this opportunity to be here today.

Senator Cochran, thank you so much for your leadership on that. We just deeply appreciate it.

When I was thinking this morning about how to use 5 minutes to try to talk about how desperately we need adequate funding for Parkinson's research, I realized that what I should do is try to have you, as best you can, sit in our shoes for those 5 minutes, because it is so confoundingly hard to describe what our life is like. So that is what I am going to try to do. It is about waiting for a rescue, basically.

I am 13 years post my Parkinson's diagnosis—a day I will never forget. At this point, the drug we all take, l-dopa Cinamet, just does not work as well as it did at the beginning. Because my cells have deteriorated to the point where they cannot work well enough, and there is not enough there to work with.

I am sure Dr. Fischbach talked about that a bit, and Dr. Langston will talk about that problem and all the things that they have available to try to solve it. But my reality is that this morning when I woke up, I reached over and popped that pill. It took an hour for me to be able to move enough to get out of bed. That is the frozen body that is the reality that I live with part of the time

now. That is one of those moments when all I am doing really is waiting for a rescue. I am waiting for that medication to kick in.

At first, the medication does provide that rescue. Boy, it is the most amazing miracle when it does. Because I would go from being in that frozen body to being able to come here and talk to you today and power myself on my own two feet and function in the world and be an independent citizen, with dignity. It is just that pill that did it. It is a miracle. But then it stops working.

In 1991, Anne Udall, one of Mo Udall's kids, took me to visit him at the Veterans Long-Term Care Facility. He had recently retired from the Congress because of his advanced Parkinson's and a fall that he had had as a consequence of Parkinson's, which is a frequent occurrence. Anne decided that we should go meet him. She blurted out something in the cab that I am sure she still regrets, which is that she said, you know, I guess I am taking you to see your future. Indeed she was.

He had entered the next stage that I have not entered yet and that I pray I will never reach, which is the departure from active society. At that point, he was still able to sit up in a wheelchair, and I could understand a few words that he was able to say, although with great difficulty, but he had departed from the society that I now still get to function in with dignity.

Two years later, she took me back to see him again. At that point, he was lying in his bed, unable to move, unable to speak. That was what I see as the living death which is the next stage, which is then followed by death itself. So those are three stages that I look forward to with great fear and desperation and want to have delayed—to have a rescue from as soon as I can.

What the scientists tell us, and Dr. Langston will talk about this more, is that they are ready to deliver that rescue. Attached to my testimony is a copy of a research agenda that we are collaborating with a wide variety of scientists around the country to show the Congress the clarity of their vision. Dr. Fischbach talked about needing a targeted and broad research agenda. That is in fact what this is. It talks about prevention and it talks about brain repair, which is the thrilling array of therapies, including stem cells, that the scientists are very close to being able to provide.

It is really astonishing to me their willingness to be so precise about these timetables, to talk about a cure within 5 to 10 years, to talk about effective therapies in fact with 5 and even sooner. But what they tell us every time they talk about it is how little money they have to do it. We are thrilled to have these additional centers, pursuant to the Udall Act. But what it really is is \$8 million to \$10 million. That is a tiny little step toward what they have identified conservatively now as \$240 million.

So, to simply fully fund the Udall Act, which is not done yet, is really just a first step. It is a very important step. That is what we are asking for this year, for the \$75 million, \$50 million of which would go to the Neurology Institute and \$25 million to the Environmental Health Sciences Institute, of which Dr. Ken Olden, who is here, is the Director.

They want to get started. They want to work on this. But it is really in the hands of the Congress to provide them with the weaponry to make this happen. It is really not the fault of the NIH that

they are not able. Because we do not want them to rob Peter to pay Paul. We want them to be able to focus on this aggressively without taking money from anything else.

But it is really in the hands of the Congress to make that decision. So we have tried to get the rescue from the medication, and then that stops working. We want the scientists to deliver it. But, honestly, we really feel that the rescue is in the hands of the Congress now. Because the money has to get to the scientists so that they can actually deliver it to us.

Michael talked about his vision. Every one of us has our own. This hearing room is full of people, whether they have Parkinson's themselves or they have a loved one that lives with it as they do every day. Every one of us has our own personal vision of how we are going to get back these precious freedoms of movement and speech and dignity that we all so desperately want to have our entire lives.

My personal vision centers on my family. I am lucky to have my four nieces here today, who are sitting with me. I have to say, without bias, they are among the most adorable and wonderful people on the face of the Earth. I thank them for being here. I thank my brother and sister for bringing them.

PREPARED STATEMENT

My personal vision is that I live a normal life and that I am able, as they grow up, to continue to be their buddy and their role model, as I feel I am today. I do not want that taken from me. I need that rescue. We need the help of the Congress to deliver it.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF JOAN I. SAMUELSON

Thank you for this opportunity to testify before you on Parkinson's research funding. We are most grateful to Chairman Specter and the other members of the Committee, in particular Senator Cochran, for making this day possible. The Parkinson's Action Network was created in 1991 to give voice to a community that has been largely invisible, and to increase funding for Parkinson's research in an effort to speed research, deliver breakthroughs and cure this dreadful disease.

I am one of a million Americans who suffer with Parkinson's. Parkinson's is a devastating progressive neurological disorder that makes it difficult to walk, causes uncontrollable tremors, and in its final states robs individuals of the ability to speak or move. It is caused by the degeneration of brain cells that produce dopamine, a neurochemical controlling motor function.

After 13 years with a Parkinson's diagnosis, I am at a crossroads—physically and medically. Despite all my efforts and the best medicine available, I have moments every day when I live in a frozen body, waiting for my remaining dopamine cells to receive the drugs and let me move. I watch, with frustration and fear, my ability to speak and swallow begin to slip. I have already been forced to give up so much that I love: my law practice, running, hiking—and some of my dreams. The hardest thing is being unable to do all the automatic unappreciated routines like getting out of bed in the morning, turning on the light, dressing. Every day these activities get more and more difficult—and some days they are almost impossible.

Without a medical rescue, I know what is coming: the retreat from active, independent life; then the living death of the so-called "end stage."

Eight years ago in 1991, Anne Udall, whom I met in my first years as an advocate, took me to meet her father, Congressman Mo Udall. At that time he was 15 years post diagnosis, retired from Congress because of his advanced Parkinson's, and living at the Veterans' Long Term Care Facility. On the way there, Anne said almost without thinking, "I guess I'm taking you to see your future." And she was.

At that time, Congressman Udall was still able to sit up in a wheelchair and could speak somewhat, although it was very difficult to understand. When I returned just

two years later he was completely bedridden and frozen, but in all likelihood his mind was entirely intact. We'll never know. I'm so much closer to that fate than when I first started advocating for a greater investment in Parkinson's research.

Losing independence and freedom is what scares me and those in the Parkinson's community the most. Perhaps you can understand my increasing frustration; and why I am not content to wait patiently for a cure—not when I know more can be done.

I have been meeting with Parkinson's scientists from across the country—dozens of eminent researchers—working to shape a research agenda and budget that would match the promise in finding more effective treatments and getting us closer to a cure. Wherever I go and to whomever I speak, I have found an almost unanimous consensus among the experts that we are close to unraveling this disorder. But they all say they could be working much harder.

The real problem is not the science—it's the meager (and unacceptably small) size of the federal commitment to eradicate Parkinson's.

The attached research agenda is the first attempt to summarize the several areas showing great promise for a rapid return on a research investment. The estimated annual cost for this focused research campaign is conservatively estimated by the neuroscientists at \$185 million—almost double the initial Udall Act authorization.

Passing the Udall Parkinson's Research Act in 1997 was a great achievement, but the promise of that Act has yet to be realized. The law authorizes the National Institutes of Health to spend at least \$100 million for focused Parkinson's research. Small increases to Parkinson's research have been made, and several additional Parkinson's research centers are promised. We're glad to see that. But the new spending is a tiny effort in contrast to what the scientists could be doing.

Over the last eight years, we have tried with little success to significantly increase funding to Parkinson's research. As the attached chart shows, when we started, the number for Parkinson's funding was pitifully low [stuck for years at about \$26 million]—and it has never grown much greater. The NIH has increased its reported number significantly but primarily by including increasing amounts of “related” funding, not funds for focused or direct research.

In fact, the gap between the funding and the potential research has become a chasm. The small increase in Parkinson's spending has produced only a skirmish when what we need is a serious war.

It has never been altogether clear how much is being allocated for Parkinson's-focused research—the requirement in the Udall Act. As a result, beginning in fiscal year 1997, Representative Fred Upton, the Udall Act's House sponsor, asked the NIH to document its reporting by providing information on the grants it included as “Parkinson's research.” Then, we asked scientists who are experts in Parkinson's research to evaluate the NIH research portfolio on Parkinson's. In both years, the results confirmed what we were hearing from the nationwide research community: despite the passage of the Udall Act, funding for research that actually would benefit Parkinson's patients remains unacceptably low.

This past year, the Parkinson's Action Network asked a group of 15 key Parkinson's researchers from many of the nation's top academic or independent research centers to review abstracts of the grants the NIH identified as spent for Parkinson's research in fiscal year 1998 at the National Institute of Neurological Disorders and Stroke (NINDS). Many are the chairs of their departments; the majority receive and/or have received NIH research funding and currently serve and/or have served on NIH study sections. (We had waited for several months for the NIH-wide list requested by several members of Congress but it was unavailable.)

Their evaluation found the federal research investment in Parkinson's to be far less than that report by NIH to Congress. Specifically, the scientists found that 26 percent (\$19 million) of the grants allegedly spent on Parkinson's research, were spent on research that is non-related to Parkinson's. For example, the grants funded research focused on Alzheimer's disease, Huntington's disease, drug abuse, AIDS, and work at the National Institute of Diabetes and Digestive Kidney Diseases, among other things, and had no likely benefit for Parkinson's. Furthermore, the evaluation found that of the \$75 million NINDS claims to spend on Parkinson's, only 44 percent (\$33 million) is spent on research directly related to Parkinson's. Another 28 percent (\$21 million) is spent on research that may indirectly benefit Parkinson's, with the remaining 26 percent (\$19 million) spent on research that will not help Parkinson's patients.

While we have felt enormously frustrated in our efforts to get a clear picture of Parkinson's research funding, we do not want this to be a debate about numbers. The real message is this: more funding must be devoted to Parkinson's focused research. Without it, the scientific community won't have the ammunition to find ef-

fective treatments and the path to a cure to help me and the million Americans living with this disease.

The solution is with the Congress. We believe NIH and the institutes with a particular focus on Parkinson's want to do more—but need the resources to do so. They don't want to take funding away from other critical research—and neither do we. What the Parkinson's community is asking is for the Committee to provide an additional \$75 million more for Parkinson's—over and above what is currently being spent. Of this funding we would like to see \$50 million for the National Institute of Neurological Disorders and Stroke and \$25 million for National Institute of Environmental Health Sciences—where the promise for finding a cure is the greatest.

The consequences of inaction are very real for the Parkinson's community. The costs to society are enormous as well. With annual costs now in excess of \$25 billion, we are only seeing the tip of the iceberg. Very soon the Baby Boom generation will reach the average age of onset—57—and the annual costs in medical care, lost wages, disability will grow exponentially.

At the height of the polio epidemic there were 58,000 people diagnosed with the disease. And of that 20 percent became what they called “paralytic”—those permanently disabled and crippled by the disease. People took enormous precautions in the summer polio “season” when it seemed to strike the most.

Parkinson's strikes 60,000 people every year and the season for Parkinson's is 365 days a year.

We must rally against Parkinson's as we did so successfully against polio. We must bring an end to this disease that disables so many. And the only way that is going to happen is through an adequately focused research effort that is driven by the desire to save lives.

Please don't let another year go by without fulfilling the promise of the Udall Act. Thank you.

Senator SPECTER. Thank you very much, Ms. Samuelson.

Would you ask your daughters to stand, so we can all see them.

Ms. SAMUELSON. Stand up. From the left they are Anna, Rachel, Sarah, and Leah.

Senator SPECTER. Your brother is here.

Ms. SAMUELSON. My brother is here, Mark Samuelson, and his wife Beth. My sister Judy Samuelson. I am so fortunate to have such wonderful family.

Senator SPECTER. Thank you very much. That certainly does personalize it.

STATEMENT OF JAMES CORDY, PRESIDENT, GREATER PITTSBURGH CHAPTER, NATIONAL PARKINSON'S FOUNDATION AND LEADER, PARKINSON'S ALLIANCE

Senator SPECTER. Our next witness is Mr. James Cordy, of Pittsburgh, Pennsylvania. It says here he is an effective and tireless advocate. I can personally attest to that. He has a unique perspective, as a Parkinson's patient, and he has an ability to articulate the needs of the Parkinson's community. He is a founder of the Parkinson's Alliance, the only national group comprised of an administered by individuals with Parkinson's Disease. He served as President of the Pittsburgh Chapter of the National Parkinson's Foundation, and is a member of their Board of Directors.

Thank you for joining us today, Jim, and the floor is yours.

Mr. CORDY. Thank you, Senator Specter, Senator Cochran.

I contracted Parkinson's 12 years ago, which is a further statement that this is not an old person's disease. I was 40 when that happened. Prior to that, I was in research and development for a specialty steel company. Not noted in my credentials, I was part of that magnificent grassroots effort that saw enacted into law the Morris K. Udall Parkinson's Research and Education Act.

I am here today to give testimony in support of a dramatic increase in Parkinson's research that that bill envisioned. I brought

this hourglass today, as I carry it a lot of places as you well know, to serve several functions. Hopefully it will keep me within my allotted time period. But, more importantly, it is to convey to you that we who have Parkinson's are in a race against time. Just at the top chamber is depleted relentlessly grain by grain, so is my top chamber, my brain, losing brain cells which control movement, day by day.

I am here today to help give Parkinson's a human face, as Joan and Michael did. Parkinson's is a degenerative disease of the brain. When my medications are working, I approach some form of normalcy. In fact, I sometimes think I do not do our cause a service because I look pretty good. But when those medications are not working, I struggle, as Joan and Michael talked about. I cannot, at times, button my shirt, tie my tie, drive my car, shuffle papers. Some things seem pretty small. A friend of mine recently was able to put his socks on again. That was a big improvement in quality of life.

I witness this disease slowly but surely erode my physical abilities. I lost my facial expression, my sense of smell and I have a monotone voice. I would not be here today if that was the extent of my problems. Unfortunately, those are just a preview of the horrors to come if we do not cure this sinister disease.

With Parkinson's Disease, what terrifies me and all that have it is the real possibility we might end up like the recently deceased Morris Udall, bedridden, unable to move or talk. I have heard the saying that God helps those who help themselves. We certainly try to do that. We successfully encouraged Congress to pass the Morris K. Udall bill. We supported last year's record increase in NIH appropriations.

But we did not stop there. In an effort to make sure that there is a continual pool of high-quality Parkinson's research proposals, a group of us, mostly with Parkinson's Disease, have formed a group called the Parkinson's Alliance, with the concept of providing seed money. This program is intended to encourage new approaches to Parkinson's Disease research, thinking outside the box as they say.

Relatively small grants from the private sector will be made to new researchers and researchers not previously working in the Parkinson's arena. These grants are intended to underwrite the costly pilot data that is a virtual necessity to get an NIH grant now. Congress and I think NIH, through your appropriations committee, needs to be prepared to fund these additional proposals if we are going to reach the potential of this new and exciting program.

I could not help but thinking back to when the Udall bill was introduced several years ago, when Congressman Upton said we can cure Parkinson's for the price of an on-ramp on an interstate. That seems like a fairly small amount.

We are going to cure Parkinson's Disease. The certainty with which I make that statement is based on the opinion of a majority of neuroscientists that Parkinson's is curable in the near term. When Dr. Fischbach and other scientists make that 5 to 10 years, I say that despite their extremely good credentials, medical science is exploding so rapidly that it is impossible for us to predict that.

I just cite the things like the Internet. Who knew what the Internet was 3 or 4 years ago? Now it is part of our daily lives. So I look for that 5 to 10 to be cut down to 2 to 4. Again, stem cells might do that.

I have been coming to Washington for 4 years. Conditions have changed dramatically. Back then, there was a massive budget cutting and deficits. Now we have surpluses. Four years ago there were relatively few people who knew about Parkinson's. Now, thanks to people like Muhammad Ali and Michael J. Fox, awareness has increased and it is widespread, all of which should promote a more positive climate for Parkinson's Disease.

PREPARED STATEMENT

The reasons for passing the Udall were compelling. But we have not realized to date the necessary resolve to get the job done. It was suggested that we have a neurodegenerative initiative, with Parkinson's leading the way. This could result in a possible domino effect in neurology and neurological diseases. It would rid this world not only of Parkinson's, but ALS, Huntington's, and Alzheimer's. To have this domino effect, the first piece must fall. We need the sense of commitment and sense of urgency to realize the potential of the Udall bill to cure Parkinson's in years rather than decades.

Again, I just want to thank all of you for your support. Senator Wellstone, who I see just arrived, thank you.

Senator SPECTER. Thank you very much, Mr. Jim Cordy, for those very poignant and personal comments. It certainly brings the whole issue home.

[The statement follows:]

PREPARED STATEMENT OF JAMES CORDY

Mr. Chairman and members of the committee. My name is Jim Cordy. I've had Parkinson's disease for 12 years. Formerly I was an engineer in R&D at a specialty steel company. Parkinson's forced me onto disability 4 years ago. I am president of the Greater Pittsburgh chapter of National Parkinson Foundation, on their national board of directors, and leader of the Parkinson Alliance. I am also part of that magnificent grassroots effort which saw enacted into law the Morris K. Udall Parkinson's Research and Education Act. I'm here today to give testimony in support of the dramatic increase in Parkinson's Disease research envisioned by the Udall bill.

I brought this hourglass to serve several functions: Hopefully, it will help me stay within my allotted time, but most importantly, it is intended to convey to you that we who have Parkinson's are in a race against time. Just as the top chamber is depleted relentlessly grain after grain, so is my top chamber, my brain, losing nerve cells which control movement day by day.

I'm here today to help give Parkinson's a human face. Parkinson's disease is a degenerative disease of the brain. When my medications are working I approach some form of normalcy. Perhaps as I walk away from this table some may think "he doesn't look so bad to me". But those medications without which I would be unable to function lose their effectiveness with time. The beginnings of that loss are just happening to me. I'm falling behind in my race against time. As a result my hands and legs sometimes shake and my body is stiff. I have witnessed this disease slowly but surely erode my physical abilities. I can no longer tie my tie, wash my hair or tuck my shirt in. I can't shuffle papers or drive my car. I have lost my facial expression, sense of smell and I now have a monotone voice. But I wouldn't be here today if that was the extent of my problems. Unfortunately those are just previews of the horrors to come if we don't cure this sinister disease. What terrifies me and all who have Parkinson's disease is the real possibility that I might end up as the recently deceased Mo Udall bedridden unable to move or talk.

I sometimes think I do not serve the Parkinson's research cause well when I come to Washington.

The image I want to leave you with is the horror of Parkinson's disease. A woman from California wrote to me describing the final ordeal her mother suffered. The body of this former Olympic athlete had shriveled to 60 lbs and she had assumed a fetal position for her final three years. Three years. This is the image of Parkinson's I want to leave you with this and the promise of hope.

I've heard the saying that God helps those who help themselves. We have certainly tried to do that. We successfully encouraged Congress to pass the Udall bill. We supported last year's record increase in NIH appropriations. But we didn't stop there. In an effort to make sure there is a continual pool of high quality Parkinson's research proposals a group of people, many with Parkinson's disease, the Parkinson Alliance, began promoting the seed money concept. This is a program is intended to encourage new approaches in Parkinson's disease research. Relatively small grants from the private sector are made to new researchers or researchers previously not working in the Parkinson's field. These small grants are intended to underwrite the cost of developing pilot data for the purpose of submitting an application to NIH for a much larger research grant. Congress and NIH will have to be ready to fund the additional applications that soon will sprout from the seeds.

We are going to cure Parkinson's disease. The certainty with which I make that statement is based on the opinion of a majority of neuroscientists that Parkinson's is curable in the near term. The question is when? I've been coming to Washington for 4 years. Conditions have changed dramatically. Back then there was massive budget cutting and huge deficits. Now we have surpluses. Four years ago relatively few knew what Parkinson's was. Now in part because of our efforts, but more because of well known people such as Muhammad Ali and Michael J. Fox, the awareness has increased dramatically. We have widespread bipartisan support, we have done everything that we can think of to do. All of which should promote a more positive climate for Parkinson disease research.

Senator Specter, committee members, Dr. Fischbach thank you for your support. We have made real progress. The reasons for passage of the Udall bill were compelling but we have not realized to date the resolve necessary to get the job done. It was suggested that we have a Neurodegenerative Disease Initiative with parkinsons leading the way. This could result in a possible domino effect that would rid the world of not only parkinsons but ALS, Huntingtons and Alzheimers. To do this the first piece must fall. We need the commitment and sense of urgency necessary to realize the potential of the Udall Bill and cure Parkinson disease years rather than decades.

STATEMENT OF DR. J. WILLIAM LANGSTON, PRESIDENT, PARKINSON'S INSTITUTE

Senator SPECTER. Our final witness is Dr. J. William Langston, President of the Parkinson's Institute. He is a graduate of the University of Missouri Medical School. He served as Chief of the Valley Medical Center. He is a member of the faculty at Stanford University and a Senior Scientists with the California Institute of Medical Research.

Thank you for joining us, Dr. Langston, and we look forward to your testimony.

Dr. LANGSTON. Thank you very much. I would like to start by thanking you, Senator Specter and Senator Cochran, for having us here and having this hearing.

I am a neurologist. I do research in Parkinson's Disease. I have dedicated my entire career to trying to find the cause and cure for this disease. I think, after listening to Michael Fox and Jim Cordy and Joan Samuelson, you can probably understand why.

I have a very singular purpose in testifying, as a researcher, someone out there embattled in the field, trying to solve this disease. That is to try to give you the perspective of the research community as to why there is optimism in the field.

Senator Specter, you said something that really heartened me in your opening remarks. That is that there have been estimates that

we could possibly make major progress, perhaps solve the disease, find the cause, in 5 years, but that was not fast enough. Well, we feel the same way. I want to tell you, there is a whole cadre of researchers out there, lined up, ready to go if you and NIH can give us the support to get there.

A second comment that was made by Dr. Fischbach that I think is extremely important and that I would like to emphasize is that while science is full of serendipity and unexpected surprises in research, sometimes you hit a point where it is time to focus. I truly believe that we now are at a point where there is enough knowledge—and Dr. Fischbach superbly outlined all of the research that is going on in this field—that it is time to focus.

With a focused effort, the pieces are in front of us, the science is there, I think we can make major progress towards this disease. I laud NIH's efforts. It is a wonderful first step. We have a long way to go, and I think everybody would agree on that.

There is a real sense of excitement, promise and urgency in the research community. I think most of us feel that this disease can be solved. It may be the first of the diseases to be solved. But we must pursue every lead relentlessly if we are going to get there.

I would like to mention just several major research areas where I think there has been progress. Again, Senator Specter, you asked what has been done with NIH funds. Earlier this year, in the *Journal of the American Medical Association*, a twin study was published, the largest twin study ever done in Parkinson's Disease. It involved every twin, living twin, that served in World War II. The results of that twin study were very important.

They showed that the vast majority of patients, particularly older patients with this disease is probably due to something in the environment or triggered by something in the environment. That means that we need to invest in epidemiology. Epidemiology is expensive. It is time consuming. Without knowing if this was the right direction to go, we would not want to put that kind of money into this science. Now we know that is the way to go.

If we can find the triggers, or causes, in the environment, we could have primary prevention of this disease, and eradicate it. So that is the future and the past in that area.

There are also genetic forms of Parkinsonism. Two years ago, researchers at NIH cloned the first gene that causes a form of Parkinsonism. While these families are very rare, it has yielded tremendous research dividends already. We now know of proteins that are abnormal in the brains in Parkinson's. This is a lead that could help us solve and perhaps cure this disease.

In terms of mechanisms of degeneration, there is a huge amount of research going on. If we can find out why those cells die, we can intervene and block that process. Parkinson's is usually mild when it is first diagnosed. If we could stop the disease there, we could basically have something that was close to a cure.

There has been a huge amount of progress in surgery. Dr. Fischbach has already talked about those.

Stem cell technology looms as a very exciting area. For those of us who lived through the fetal transplant era and Federal bans, I think it is like Yogi Berra once said, it's *deja vu* again. We are hav-

ing trouble because of bans on research. That needs to be changed. This is one of our great hopes, I think, for a cure for this disease.

Once cells die in the brain, they are gone forever. To repair the brain, we are going to have to find ways to get new sources of cells, put those into the brain, so they can take over the job of the missing cells.

I would like to close, since I see my red light is up, with one final statement. I really believe what I am about to say. I think today it can truly be historical for Parkinson's research. I hope that we have convinced you, and ultimately can convince Congress, that a major investment in Parkinson's research is not only critically needed, but justified many times over by the opportunities in front of us.

Such an investment could yield huge dividends, not only for Parkinson's, but other neurodegenerative diseases, as well. Possibly, just possibly, we may be able to end this terrible disease once and for all.

Thank you.

Senator SPECTER. Thank you very much, Dr. Langston.

[The statement follows:]

PREPARED STATEMENT OF J. WILLIAM LANGSTON

Good morning. It is a pleasure and honor to be here. I would like to begin by briefly describing my own background. I am a neurologist, and have dedicated my entire professional career to research and patient care in Parkinson's disease. I have published 250 papers in the area and I see patients with this disease every day and. I am also founder and President of the Parkinson's Institute in Sunnyvale Ca, located in the heart of Silicone Valley.

My goal today is to impart the sense of excitement, promise, and urgency that currently pervades the Parkinson's disease research community. I believe with the adequate resources and manpower, we can solve the complex riddle of Parkinson's disease. Research opportunities abound—never before have we had so many new leads. But we must pursue these leads as vigorously as possible if we are to conquer this terrible disorder.

I would like to begin with research on the cause. As a result of a study published earlier this year in the Journal of the American Medical Associate, we now have a much clearer picture of how to invest our resources to achieve this. This NIH funded study involved interviewing all of the living twins who served in World War II. Nearly 20,000 twins were interviewed, the largest twin study ever done for Parkinson's disease. After examining all of the identical and fraternal twins with suspected disease, the results showed that typical Parkinson's disease, when beginning over the age of 50 is not due to genetic causes, but rather must be caused or triggered by something in the environment.

For the research community, this is a huge branch point. It means that we can and should focus on environmental influences by studying populations of individuals, including the WW II twins. Such studies require major investments in time and money, but with this new data we now know that such an investment is worth it. Studies to date have pointed to pesticides, herbicides, rural living, certain heavy metals, and of course there is the inverse relationship to cigarette smoking. Let me stress that, if causative agents can be identified in the environment, ways to avoid and/or minimize effects of exposure could lead to primary prevention of the disease. This is our ultimate dream.

Does this mean there is no role for genetics? Not at all. Unexpectedly, the same study in twins showed that when parkinsonism begins earlier in life there is a strong genetic component. I think I can safely state that there is a near unanimous consensus in the research community that unraveling the genetic parkinsonisms, while solving a very small percentage of the cases, will provide invaluable new clues on the cause of typical Parkinson's disease. Finding new mutations that cause parkinsonism will lead to identification of new genes. This will lead to the identification of new proteins that may be key players in the process of cell death.

Let me give an example. In 1997, investigators at the human genome project identified a mutation in a form of familial parkinsonism. The mutant gene produces a

protein known as α -synuclein. It turns out that only a few families on earth have this mutation, but this same protein has been found to aggregate in nerve cells in virtually all cases of typical sporadic Parkinson's disease, in structures known as Lewy bodies. This has opened up an entirely new avenue of research, and raised the possibility for the first time that Parkinson's disease may be a protein aggregation disorder, something that has been suspected for years in Alzheimer's disease. A second and entirely different mutation has already been identified in another form of familial parkinsonism, and I suspect there will be many more. The affected proteins can be used to model Parkinson's disease in transgenic mice, and can be used to study mechanisms of cell death. An all out approach to identify new genetic forms of parkinsonism could have scientific yield, and we are just in the beginning stages of this research.

And this is only one of the many areas of laboratory investigation that are currently underway to better understand Parkinson's disease. Areas currently under investigation include studies on free radicals, excitotoxicity, nitric oxide, the process of programmed cell death, and even inflammation as possible causes of cell death in Parkinson's disease. Each represents an exciting and important area of basic research, which, if positive could have enormous therapeutic repercussions. If we can identify the mechanisms by which these cells are dying in the brain, even if we don't know what kicks the process off, we may be able to intervene by blocking the process, and slowing or halting disease progression. This could lead to secondary prevention if we could identify the disease in its preclinical state, something I will return to later.

Now I would like to turn to patients who have already been affected and disabled to a greater or lesser degree by Parkinson's disease. Primary and secondary prevention are exciting goals, but what can do for those who have already been damaged by the disease? We must find ways to repair or restore the damaged areas of the brain. It sounds impossible, but in fact new strategies are emerging constantly.

To explain how this works, I need to give you a brief primer. In Parkinson's disease, the brain cells that make a substance called dopamine begin to die. Without dopamine, the motor system shuts down, leaving patients frozen and unable to move. Because the brain is incapable of making new cells, one of the few hopes for a cure is what we call cell replacement therapy. Progress in neural transplantation has been substantial over the last 15 years. We now know that this technique is feasible and safe. Furthermore, it is known that transplanted cells survive after transplantation into the brain and are capable of exerting therapeutic benefit, although technological barriers remain (for example, only approximately 10 percent of cells survive). However, the recognition that the use of human fetal tissue is likely to be limited in the foreseeable future, an intensive effort is under way to find alternatives. Promising lines of research in the use of xenografts, bioengineered cell lines, and the use of progenitor or pluripotent cells. The latter are in the earliest stage of development, but may be the most exciting in the long term. Any success in this area could lay the groundwork for serious attempts to cure this disease. To quote my colleague, Dr. Rusty Gage of the Salk Institute, a preeminent researcher in this area. "This is an ambitious agenda which, while focusing on Parkinson's disease, if funded in excellent laboratories, will yield broadly relevant results".

How do we best get there, the most quickly? To quote Dr. Gage again "One should consider establishing regional testing centers, where reliable models in rat, mouse and monkey are routinely established; where basic investigators can apply to try out their latest ideas without having to set up the models in their own labs and learn by making all the mistakes that have already been made. These centers could also be places where better models are being designed all the time. These centers could eventually form an alliance with clinical trials to make sure that the trial reflects what is really known from the pre-clinical work, and if a clinical trial is conducted, it would be done in such a way that no matter how it turned out, the pre-clinical centers could take the results and build on them".

There is an alternative strategy that should be vigorously pursued. This involves reviving or restoring cells that are still in the brain, but are non-functional. Even though most of dopamine is gone, only about 60 percent of cells are lost, well below the threshold that leads to symptoms. This means that there are many cells still present that are not functioning. If we can turn on even half of these remaining brain cells, we might be able to reverse the Parkinsonism entirely, and there are substances that may do this. Growth factors are being actively investigated, but do not get to the brain. A new family of trophic factors has been discovered in the last few years called neuroimmunophilins. These compounds can cross the blood-brain barrier, and if effective, could accomplish everything we hope to achieve with surgery, without the surgery.

This brings me to currently available surgical techniques. The last decade has led to a true renaissance surgical approaches for Parkinson's disease. This was the direct result of the powerful model for Parkinson's disease, which has allowed us to learn a great deal about the circuitry of the basal ganglia. For the first time we know where to intervene to balance out the abnormal brain circuits in Parkinson's disease. A particularly exciting innovation is the use of deep brain stimulation. Electrodes are placed deep in the brain, and stimulated using a device that resembles a cardiac pacemaker. This technique is as effective as older ablative procedures, but not permanent and therefore much safer. It can be done on both sides and in areas of brain that we could not otherwise approach. One deep stimulation area in particular has been found to be very effective, the subthalamic nucleus or STN. Indications are that between 10 to 30 percent of patients may be able to go entirely off medications. But to continue this work, a great deal of work needs to be done, both experimentally and in practice. We still don't understand how it works and we may not have found the best area to stimulate yet. Few centers in the country are trained or experienced to do this type of surgery, and because of expense, large scale trials have yet to be done. A great deal of work lies ahead of this to bring this exciting new technique to fruition.

Finally, I want to draw your attention to a critical research area where there is a huge gap, and that is the need for a biomarker. Simply put, this is a biologic test that can be used to determine presence or absence of a specific disease. At the moment there is no biomarker for Parkinson's disease. We desperately need one because clinical examination is accurate only about 75 percent of the time. This means we are wrong 1 out of every 4 times. This not only affects patient care, it can severely affect research. For example, when investigating the cause, if some of the patients you are studying don't even have the disease you think they do, one might easily miss a vital clue as to the cause. In carrying out new drug trials, mixing in patients that don't have the disease might easily one thinks they have could dilute out an otherwise positive result.

Fortunately we have an exciting start in this area with new imaging procedures. Positron imaging technology is a powerful way to look at the brain during life, but for cost and technical reasons will likely remain a research tool. A newer technology, called SPECT scanning, could be widely used, but at the moment less than a handful of centers are doing this procedure, and we have a long way to go before this can be widely used for both research and practice. The other major gap is there is much more to be learned from it. In the long run, we will really need a biomarker that can be used to screen the general population for preclinical disease. If that can be developed, and we learn more about the mechanism by which cells die, we may be able to intervene to halt the disease with "neuroprotective" before it even appears clinically, something that could be the near equivalent of cure.

In summary, I would like to close by saying that I believe that this could be a historical day for Parkinson's disease research. I hope that, by the end of this hearing, we will have convinced you that a major research investment in not only critically needed, but fully warranted. I truly believe that we are at a place in the scientific history of research on Parkinson's disease where such an investment could yield huge scientific dividends. If so, our society and the patients we serve will be the real winners.

Thank you for your kind attention.

ISSUE IN HANDS OF CONGRESS

Senator SPECTER. In listening to your testimony, Ms. Samuelson is exactly right, that this issue is in the hands of the Congress. There is no doubt about that. We have a total budget which is almost \$1.8 trillion, a staggering sum of money. Nobody can really comprehend that amount of money. If you took a large room like this, there would be insufficient space to stuff \$10,000 bills into it.

When Jim Cordy talks about the desire of conquering Parkinson's in 2 to 4 years, I agree, and less if possible.

When Michael J. Fox asks for \$75 million more, we could do it if we increased overall NIH funding by about \$1.3 billion.

If we start the battles among the various institutes and ailments, I think it would be very counterproductive. So what has to be done is to raise all the boats with the overall funding. That is something that many of us would like to see happen.

Just a very brief statement on the practical politics of what happens. Two years ago, we had a sense of the Senate resolution to double NIH funding over 5 years, 98 to nothing. Then, when the issue came up about adding the money, to add first a trillion dollars, 3 years ago, it lost, 63 to 37. So Senator Harkin and Senator Cochran and I doubled the request. Senator Wellstone joined. If at first you do not succeed, double the request.

We asked for \$2 billion. Again we lost. We got a few more votes. But this subcommittee went to the drawing board with some sharpened pencils, and we found the money by rearranging priorities.

Again, this year, we have determined to rearrange the priorities and add \$2 billion more. So when you had \$120 billion to research, that is very, very substantial. But I do not disagree with you, Mr. Fox, about adding \$75 million more. When you look at our total budget and you look at the wealth of this country, there is no reason why every valid research application should not be granted. Every one ought to be granted.

Right now, there are about seven closed doors which are unopened. Out of every 10, three are opened for research; seven are closed. But that requires the will of the Congress to do so in the priority-setting. You have available to you the members of the Senate and the House who have voted no on increasing NIH funding. So it is a fairly direct matter to mobilize America to get the increased funding.

When you come and tell your stories, and understandably with tears in your eyes, and Michael J. Fox wants to see his children's weddings, it is very understandable.

When Ms. Samuelson wants to be the buddy to her family youngsters, it is understandable.

When Jim Cordy gets emotional about having a normal life, it is understandable. We have to fund Dr. Langston.

Any concluding comment, Dr. Langston? I will give you each one more chance for a concluding comment.

Dr. LANGSTON. Well, I just want to say, again, for someone who is out there working day to day on this disease, seeing patients every day with this disease, something like that is heartening and inspiring. I just hope we can look back and see that this was the beginning of something very, very important that helped us solve this disease as we go into the new millennium.

Thank you again for the opportunity to be here.

Senator SPECTER. Mr. Fox, you put your finger right on top of the core issue—hope, hope, there is good reason for hope.

Mr. FOX. Right.

Senator SPECTER. But we have to translate that hope into action now. Concluding comment, Michael?

Mr. FOX. I would say my comment is—and I did not graduate from high school, but I learned enough Latin to be able to say this—*carpe diem*. We are there. If I can do anything, I hope that I can bring a little attention to the fact that—you know, all kinds of people have hardships and struggles and face issues.

Certainly by highlighting our battle, we are not diminishing anyone else's battle or need for help. But someone mentioned the word "prioritizing." We are there with this. We are really there. If we

can just get a focus on it, I really think we can get this done. We will be out of your way.

Senator SPECTER. Thank you very much, Michael.

Any concluding comment, Ms. Samuelson?

Ms. SAMUELSON. Well, I do think that says it all. This is the time. We realized some time ago that what we needed to do as a community was partner up with the scientists, to help them get what they needed. I think it is a partnership with the Congress. It is thrilling to hear that there is interest in that, in getting this done and providing the money to do it.

Senator SPECTER. Thank you very much.

Jim Cordy, any final comment?

Mr. CORDY. You talked about trying to convince Congress to do this. The number that Joan came up with, it would cost society \$25 billion a year, and if we spend \$100 million a year to cure that. You were talking about people grasping the billions of dollars. I broke that down. For every dollar spent, we would save \$250. That is just a tremendous return on investment and one I do not think we can pass up.

Lastly, one other thing, just so I do not catch a lot of hell from my granddaughter, and my niece is standing up, she is in attendance, and I would certainly like to dance at her wedding.

Senator SPECTER. Thank you very much, Jim.

Senator Cochran.

Senator COCHRAN. Mr. Chairman, let me conclude my part of this hearing by thanking you for your strong leadership. You have really shown the way, and you have gone out front in leading us to more dollars for NIH. We now have to continue to support you, as we go to the full committee today and the floor of the Senate tomorrow, to get support for this additional funding, and then make it stick in conference, and get the President to sign one of our bills. That will be helpful, too.

But we have an opportunity, as I tried to mention in my opening statement, an opportunity and an obligation. The opportunity is to give people a chance to restore normalcy and control over their own life, to find a cure for this dread disease. We have the opportunity to give renewed hope to millions of Americans who are affected by Parkinson's Disease, by making clear our commitment to provide the resources necessary to cure the disease.

For those who are involved in the research, like Dr. Langston and Dr. Fischbach, we thank you for your very strong, imaginative and dedicated efforts to make this dream a reality.

Thank you.

Senator SPECTER. Thank you very much, Senator Cochran. Thank you for all of your leadership and help.

Senator Wellstone.

Senator WELLSTONE. Thank you, Mr. Chairman. I am not really a member of the committee.

Senator SPECTER. Well, in that event, Senator Wellstone, we will still let you speak.

Senator WELLSTONE. I thank you for your graciousness. I actually do not have any prepared remarks. Let me do this in 1 minute.

I always agree with Senator Cochran.

Senator COCHRAN. Do not hurt me now.

Senator WELLSTONE. I thought I was hurting myself.

I think that you really have done excellent work, Mr. Chairman. I think you are right about the need to expand the NIH budget. If I could snap my fingers and have it my way, we would do even much more. Because otherwise we would get one group of people with a disease pitted against another group of people, and it just does not make sense.

I know we do not earmark, but I love this language, you know, having worked on this legislation for a long time, that will make it clear that we will get the funding that we absolutely believe we deserve, that is in the Udall bill. So we have got to do the work. That is right. The only other thing I would say is I would like to thank everyone.

Jim, when you talked about the courage of Muhammad Ali, or Mr. Fox for being here, you are right. It is important for people who are so well known nationally to speak out and to say, look, you know, with the funding we are providing, we could finally cure this disease, and we are going to tell you time is not neutral, it is not on our side, and we need for you to do this. I also want to thank the people in the Parkinson's community, whether it be people with Parkinson's and whether it be their loved ones, for their speaking out too.

It has been a really important, effective citizens' lobby. The only reason we are where we are today is because of the strength and the courage and the dignity of the people in the community. So I agree with Michael J. Fox, that you will be out of our way, but only after we get this job done.

Thank you.

Senator SPECTER. Thank you very much, Senator Wellstone.

Without objection, we will put a statement from Senator Murray in the record.

[The statement follows:]

PREPARED STATEMENT OF SENATOR PATTY MURRAY

Mr. Chairman: I want to thank you for scheduling this important hearing and I want to also thank all of today's witnesses for coming before the Subcommittee to present their testimony. I look forward to reviewing your written testimony and want to commend all of you for your commitment and dedication to increase the awareness of Parkinson's, and working to one day find the cure for this devastating illness.

I have heard from many families in Washington state who have been touched by Parkinson's. I have heard their stories and know the heartache they face. I know first hand how a disease like Parkinson's can strike the entire family. Last year I met with a young father who told me that he was not able to go camping with his son last summer. He told me how he had always enjoyed the camping trips he had with his son but he could no longer endure the physical demands of camping. He has lost this precious time with his son, and his son has lost as well.

As a member of the Senate Appropriations Committee and the Senate Health, Education, Labor and Pensions Committee, I have worked hard to increase our commitment to biomedical research. As a Member of the Appropriations Committee, I have worked, along with our Subcommittee Chairman, to increase NIH funding by well over 40 percent since 1993. As a member of the HELP Committee, I was part of the Committee's efforts to revitalize and modernize the Food and Drug Administration to ensure that life saving, experimental drug treatments got to patients faster. I consider enactment of the FDA Modernization Act as one of the major accomplishments of the 105th Congress. My work was based on my belief that we must improve access to treatments and life saving drug therapies.

I have now become more and more concerned about access. We have 47 million Americans with no health insurance. We have health care decisions being made by

health insurance bureaucrats instead of doctors and patients. We have health insurance companies that are denying access to clinical trials and experimental treatments, and health insurance policies that discourage or penalize those who need access to highly specialized care. What good does it do to double NIH funding or modernize the FDA when millions of patients are denied access to new drug treatments and therapies?

Could you briefly touch on the issue of access and how we can ensure that all Parkinson's patients can access life saving treatments? What impact or role do clinical trials play in expanding access and knowledge of Parkinson's disease? How important is it for a Parkinson's patient to have access to speciality care and cutting edge biomedical advances?

Senator SPECTER. We thank all of you for coming. May the record show that in this audience there are many people here in wheelchairs, with canes and walkers, showing the disability and the further need for action and for adequate funding.

CONCLUSION OF HEARING

Thank you all very much for being here, that concludes the hearing. The subcommittee will stand in recess subject to the call of the Chair.

[Whereupon, at 10:50 a.m., Tuesday, September 28, the hearing was concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

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