Mr. Chairman, Senator Baucus, Members of the Committee:

I am Peter Corr, Senior Vice President, Science and Technology, Pfizer, Incorporated. Thank you for allowing me to address the Committee today on a critical issue – the link between our nation's global competitiveness and our investments in higher education.

Every single day in my work at Pfizer, I see irrefutable proof that a workforce with higher education is absolutely crucial to the ability of the United States to maintain its leadership position in science, technology and business. The scientific and technological advances we can expect in the near future – particularly in medicine, with our budding knowledge of genomics, proteomics and gene therapy – will make higher education increasingly important to society.

With regard to this, virtually every day I am reminded that:

- Science is getting more difficult, more complex, because we are learning more with better—more demanding—approaches;
- We need more scientists who can master multiple scientific disciplines.
- And, to meet this need we need to begin training scientists at an earlier age and nurturing their interest in science as they learn.

The availability of world class scientists from multiple disciplines is **<u>the</u>** critical element in the US retaining its worldwide leadership in the biomedical sciences, advancing our understanding of disease processes, and discovering and developing new therapeutics.

This was my view during my 20-year tenure as a university professor, and it has been reconfirmed in my position at Pfizer, the largest private biomedical research organization in the world.

Inquisitive, highly skilled young scientists are the lifeblood of any science-based business. Pfizer depends on the dogged inventiveness of over 15,000 scientists, including chemists, clinicians, and those trained in integrated biology, molecular biology, pharmacogenomics and virology to name a few areas. While the number of non-social science Doctorates awarded has declined about seven per cent from 1997 to 2001 (the last year for which the National Science Foundation had such data), the number of Doctorates awarded in the physical sciences has fallen by almost 15 per cent and in the biological and agricultural sciences by almost nine per cent. Furthermore, although Pfizer has not experienced any significant problems in finding quality candidates to fill our needs, we are seeing a lack of fully qualified candidates in areas such areas as transporter science and exploratory clinical skills, as well as in multidisciplinary skills that I will discuss further.

In 1987, Dr. Robert Solow's won the Nobel Prize in Economics for showing that technological advances are more important than capital investments to a country's long-term economic growth.

This is also reflected in the recently announced National Institutes of Health Roadmap for medical research in the 21st Century where its Director, Dr. Elias Zerhouni, makes two points central to this discussion.

First, as biomedical research grows ever more complex, we need scientists who are well versed in multiple disciplines and collaborate with their colleagues in other disciplines easily. This includes biologists who understand molecular biology as well as integrative whole-organ biology, bioinformatics, genetics, mathematics, physics and chemistry, and other disciplines.

This kind of Renaissance approach to science requires the best education possible. It argues for multiple degrees or multidisciplinary degrees, degrees that usually require more courses and take longer than a single discipline Bachelors, Masters, or Doctorate. These are also degrees that cost more in tuition and opportunity costs for the student and the future employer.

The second message from the NIH Roadmap is that human clinical research is becoming harder to do. The “easy” diseases have already been addressed. Again, this is an issue I know all too well. Tougher research requires better minds, with better training. This requires clinicians who are well trained in basic science, who are able to take basic science findings from the laboratory to the clinic for evaluation in humans, and who are able to employ the most advanced and emerging technologies and approaches to their research.

The need for these kinds of scientists raises a number of educational questions and challenges. Science-based industries require a college-educated work force including those with advanced degrees. The National Science Board estimates that during the economic expansion of the 1980s and 1990s, the number of science and engineering jobs increased 159 per cent. And for this current economic resurgence, a recent Monthly Labor Review analysis projected that expected employment growth for scientists and engineers is about 47%, or roughly two million more jobs. Yet as I discussed previously, the number of physical and biological science Doctorates awarded in the United States continues to fall. That's in stark contrast to the our international competitors, where, for example, Japan awards three times as many scientific graduate degrees (as a percentage of all graduate degrees awarded) as does the United States, and Germany awards six times as many natural science graduate degrees (as a percentage of all graduate degrees awarded) than the United States.

We often approach this as a college level problem – how do we convince college students to pursue scientific and technical degrees. But students make the decision whether or not to pursue technical degrees and careers long before college. If they haven't made this decision and the necessary preparations in their early educational endeavors, it is very difficult to convince them to pursue these disciplines after they enter college. The problem is that most students don't even think of pursuing technical and scientific education or careers because they are not taught early enough, or consistently enough, to develop an ease and love for mathematics and the sciences. Simply put, most children are scared of math and science.

As recently reported by the Committee for Economic Development, both the number of high school seniors that like math and science, and who believe it is relevant to their lives has dropped dramatically since 1990. Interestingly, it also drops dramatically as they advance through the primary and secondary educational systems, with 70 per cent of fourth graders stating they like math, but only 47 per cent of twelfth graders making that same statement. The Committee goes on in their report, "Learning for the Future: Changing the Culture of Math and Science Education to Ensure a

Competitive Workforce," as to the reasons for this, and they are across the spectrum from cultural attitudes against learning math and science, poor teacher qualifications to teach these subjects, and poorly developed curriculums in our schools.

This is wrong. And this is dangerous. Core curriculums need to be developed to immerse elementary and secondary students in mathematics and science from the earliest days of their cognitive development and to continue that immersion throughout their education. We all know our children can do it. Most five- and six-year olds can recite the Latin species and genus of most every dinosaur, We should not let them lose that wonder and joy in the discovery of scientific and medical disciplines.

There's a reason that many students change their approach to their first high school science courses from wonderment to dread: They do not learn to think like scientists when their minds are young. By the time they reach late adolescence, the parts of their brains needed for science have not been effectively developed, which makes the necessary training at this stage much more difficult. And when they enter college, such students, bright though they may be, often avoid science courses altogether, because frankly, they are no longer equipped to succeed in these areas.

I know that many Senators are concerned enough to introduce legislation that address these concerns. I commend your leadership. Let me share some Pfizer programs that we believe are advancing the important task of encouraging young people to pursue careers in science and medical investigation. Through the Pfizer Education Initiative, we have over 1,700 of our employees volunteering with almost 300 community schools to develop more robust elementary and secondary math and science programs. In addition, we have engaged in a vigorous school science laboratory renovation and construction program, providing 18 schools with new labs. Similarly, Pfizer partnered with New York City schools to provide summer study grants for elementary and secondary science teachers to learn best-in-practice techniques for teaching science.

Finally, Pfizer has a broad range of undergraduate and graduate fellowship, internship, grant, and research opportunities. These programs integrate students and researchers in the Pfizer industrial research programs, and provide them the means to engage in cutting edge research both within the Pfizer complex and their home institutions.   One of these programs is the Pfizer Minority Medical School Scholarship Program, where $10,000 tuition scholarships are provided to eight students annually from four historically black US medical schools. To date, 135 medical students have received these scholarships.

Pfizer applauds this Committee's attention to this issue, and to its commitment to the development of primary and secondary education math, science and technical programs, increasing the number of quality teachers in those disciplines, and providing parents the resources necessary to help their children develop that joy of discovery. We must consider all feasible ways and means of getting more Americans interested in science at an early age; and then to pursue undergraduate and graduate programs.

This presents us with several related tasks: We need to improve the quality of science education at all our colleges and universities, as well as our secondary and elementary schools. We also need increase the number of colleges and universities that offer superior science educations. And, we need to increase the opportunity for science-oriented students to receive the best education possible. This is important, for in a science-based career, a small difference in the quality of education and skills can make a big difference in a person's success in the complex research, discovery and development process. For the United States to remain competitive in the global market, we need our best students to be able to attend the best colleges. And that need will only grow as our scientific knowledge expands and our science-based industries advance.

Let me address on final issue. To keep scientists in this country, we also need tax incentives that are directly linked to our ability to hire the best at competitive salaries. Without the Research and Development Tax Credit, which just expired June 30^{th}, our research and development budget, will become more expensive to finance than it is today. Study after study has shown that the R&D tax credit has led to increased private sector investment in research and development. I am aware that pending legislation would extend the credit from June 30, 2004 through the end of 2005. While I regret that this legislation does not make the credit permanent, I encourage you to help ensure the extension of the R&D credit is enacted before Congress adjourns this Fall.

We need the R&D tax credit extended permanently, and we need it soon. Thank you very much for your thoughtful consideration. I will be happy to answer any questions you may have.