

Open Letter to Honorable Senators Wayne Allard and Ken Salazar and Representatives Degette, Lamborn, Musgrave, Perlmutter, Salazar, Tancredo, and Udall

Introduction

In March 2008, small groups of volunteer citizens gathered for two weekends to consider what guidelines might best steer the development of some very powerful, new technologies. Of specific concern was nanoscience and nanotechnology and the ways these are merging with biotechnology, information technology, and cognitive science. The four together often are referred to as nano-bio-info-cogno (NBIC) science and technology, which may provide powerful ways to enhance human behavior and experience.

The fourteen of us were one of six groups, and we met at the Colorado School of Mines in Golden, Colorado. Along with two in-person weekends, we got together via computer conference for nine two-hour sessions with members of other groups and NBIC experts. (More information about this project is available at the National Citizens Technology Forum web site, <http://cns.asu.edu/nctf>).

The activity as a whole was sponsored by the National Science Foundation (NSF) as part of its effort to ensure that NBIC development takes into account a broad spectrum of perspectives from all citizens. The idea behind the forum is that it is important for citizens to consider how NBIC technologies should be developed *before* they are actually implemented. The hope is that concerned citizens will be able to provide decisionmakers in government, business, and society with the *informed, deliberative opinions* of ordinary people who have taken the time to study these issues with some care.

Enhancement

As a result of this process, we have formulated some recommendations for developing, educating the public about, and regulating nanotechnology (nanotech). Our comments are directed primarily toward the implementation of nanotech for human enhancement. Enhancement is defined as the improvement of human and cognitive abilities. These abilities are said to expand the knowledge of how the human brain works, and are leading researchers to explore ways to modify its processes.

Although some may argue cognitive and human enhancement is comparable to earlier inventions such as modern electricity and computers, in fact nanotech is vastly different in that the broad scale of biological, cognitive and informational applications is unlike anything seen before. Our recommendation is that nanotech be utilized for remediation to serve the goal of helping humans gain access to equality across the board as regards quality of life. Therefore, we suggest prioritization of funding should be given for issues of remediation.

Ideally, this type of technology should be available to those who need it the most no matter their income level. We strongly recommend that legislative action ensure that private insurers cover these needs and, failing that, government will step in to subsidize costs. Everyone, regardless of socioeconomic or cultural status, deserves equal access.

Education

We discovered that nanotech is a broad field encompassing a diverse array of scientific and technological developments, yet the general public remains mostly unaware of these developments and their far-reaching implications. We therefore felt compelled to make sure the general public becomes educated on the nature of these technologies, from a thorough, accurate, and easily accessible source.

One reason for such strong feelings of unease stems from the possible effects of nanotech on humanity, society, and the ecosystem. The developments in the field of nanotech are revolutionary. For example, currently in clinical trials are Brain Machine Interface (BMI) chips, which when implanted in the deep tissue of the brain allow a person to communicate with a computer via their brain signals.

This is only the beginning for nanotech, since it is in its infancy. Promising developments range from bionic eyes to nanoparticles which detect chemical and hormonal changes early, thus eliminating disease before symptoms emerge. For many, the possibility of the elimination of disease and the ability to attain a greater quality of life is a bright prospect, yet there are many possible adverse outcomes.

The dark side of nanotech was a ubiquitous concern in our group discussions. For many the maintenance of privacy and personal identity are problematic. Nanotech could make possible nanochips which allow us to communicate directly with computers or even link to the Internet. As citizens, we need to consider who should have access to our information, and for what uses.

To ensure the effective dissemination of information, with the goal of creating greater public awareness we propose the following policy recommendations:

1) Continued citizens' forums, funded annually by the National Science Foundation, to re-evaluate nanotech issues and update policy recommendations based on changes in emerging research and public opinion.

2) Create a federally managed online clearinghouse that consolidates all current resources and information on nanotech. These resources should be advertised in a variety of popular media.

3) The development of nanotech science exhibits explaining the technology, its relevance, its implications for the near and distant future, and nanotech products such as sunscreen, beauty products, food products.

4) Grants from the federal government to fund curriculum in public schools.

5) Convene an international nanotech summit involving government agencies, non-governmental agencies, industry leaders, and citizens. The goal of the summit is to engage in international dialogue on the development of nanotech, promote the exchange of ideas, and ultimately draft an international treaty of nanotech, which would establish appropriate regulations. The treaty should, at the least, restrict the use of nanotechnology in ways which might contaminate the human race or the environment, as well as in certain military applications in addition to avoiding empowering extremist groups by giving them access to nanotech, prohibit the exploitation of under privileged groups in relation to testing and implementation of the technology, and promote the open exchange of ideas among nations.

Regulation

It is our position that these new advancing technologies will reach into areas that are not overseen by current regulatory bodies, namely the FDA and the EPA. Therefore it is our desire to see a new regulatory body established to both extend regulatory oversight over human enhancing technologies, and to alleviate the burden on current regulatory agencies.

This new Human Enhancement Regulatory Agency (HERA) would not only be responsible for the extensive testing of these types of products and enhancements, but also would be the United States' point of contact with the rest of the world.

It is imperative that the global community reaches consensus on how these technologies will be governed. Because these human-enhancing technologies are inseparable from their hosts who are free to travel across international borders, it would be in the best interests of all to find common ground with respect to regulation and implementation of said technologies.

In addition to the creation of a new regulatory agency and a commitment to the international community, we would like to voice our concern about the potential use of these technologies for coercive behavioral modification, such as the use of implants to control prisoners.

It is also foreseeable that the application of non-reversible enhancing technologies in a military context would be the first step toward an arms race that would have the inevitable result of the complete dehumanization of the future soldier. Such forced implementation of these technologies should never be allowed in a free society, and therefore should be banned.

Nanotech is going to revolutionize the world. We believe that an informed public can alter the course of this technology, so as to avoid the possible disastrous outcomes of a technology which runs rampant without proper regulation, and to ensure that nanotech is used for the greatest good for the greatest number.

Finally, we completely acknowledge and support the ability of our representatives to be flexible in accommodating these technologies as they become available. However, no matter how far this technology advances it is never acceptable for our government to use such advances to usurp civil liberties and freedoms that are guaranteed to U.S. citizens under our Constitution.

Signed,

Eric Brown, Teri Burgess, Nichole Carter, Abraham Eng, Starlyn First, Brett Kuenne, An Light, Ricky Lott, Patrick Mingus, Rose Murray, Alex Ramirez, Eldrine Richardson, Ariel Thomas, Tara Van Bommel