

**United States House of Representatives
Committee on Science & Technology**

Hearing on:

**The National Nanotechnology Initiative Amendments Act of
2008**

OPENING COMMENTS

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Woodrow Wilson International Center for Scholars
Washington, DC**

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10:00 a.m.

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I WOULD LIKE TO THANK CHAIRMAN GORDON, RANKING MEMBER HALL AND THE MEMBERS OF THIS COMMITTEE FOR HOLDING TODAY'S HEARING. MY NAME IS DR ANDREW MAYNARD. I AM CHIEF SCIENCE ADVISOR TO THE PROJECT ON EMERGING NANOTECHNOLOGIES, A PARTNERSHIP BETWEEN THE WOODROW WILSON INTERNATIONAL CENTER FOR SCHOLARS AND THE PEW CHARITABLE TRUSTS. BUT THE VIEWS I EXPRESS HERE ARE MY OWN.

NANOTECHNOLOGY IS COUNTER-INTUITIVE. IT INVOLVES A WORLD WHERE MATERIALS DON'T PLAY BY THE RULES AS WE KNOW THEM, BUT DEMONSTRATE MANY STRANGE AND WONDERFUL BEHAVIORS. METALS CHANGE COLOR. INERT MATERIALS BECOME HIGHLY REACTIVE. WHAT WAS ONCE WEAK BECOMES STRONG.

FOR INSTANCE, NANOSCALE TITANIUM DIOXIDE LOOKS LIKE A WHITE POWDER—NOTHING SPECIAL. BUT ITS SUPER-FINE STRUCTURE—INVISIBLE TO THE NAKED EYE—ALLOWS THIS PARTICULAR MATERIAL TO BE USED TO KILL MICROBES, MAKE SELF-CLEANING WINDOWS AND ENSURE THAT MINERAL-BASED SUNSCREENS GO ONTO THE SKIN TRANSPARENTLY.

BECAUSE NANOTECHNOLOGY IS COUNTER-INTUITIVE, SAFE NANOTECHNOLOGIES WILL NOT JUST HAPPEN. WE WILL NEED

LEADERSHIP AND GUIDANCE TO HELP OVERCOME OUR HUMAN-SCALE PERSPECTIVE, AND ENSURE THE RULEBOOK FOR SAFE NANOTECHNOLOGY IS BUILT ON SOUND SCIENCE.

IN THIS CONTEXT, I WANT TO HIGHLIGHT FIVE AREAS I BELIEVE ARE ESSENTIAL TO UNDERPINNING THE DEVELOPMENT OF SAFE—AND THEREFORE SUCCESSFUL—NANOTECHNOLOGIES.

FIRST AND FOREMOST, WE NEED A TOP-LEVEL RESEARCH STRATEGY THAT IDENTIFIES THE GOALS OF NANOTECHNOLOGY RISK RESEARCH ACROSS THE FEDERAL GOVERNMENT, AND PROVIDES A ROADMAP FOR ACHIEVING THESE GOALS

SECOND, A MINIMUM OF 10% OF THE FEDERAL GOVERNMENT'S NANOTECHNOLOGY R&D BUDGET SHOULD BE DEDICATED TO GOAL-ORIENTED ENVIRONMENT, HEALTH AND SAFETY RESEARCH. ANY LESS WILL RISK COMPROMISING THE SUCCESS OF EMERGING NANOTECHNOLOGIES.

THIRD, A COORDINATOR SHOULD BE APPOINTED WITH RESPONSIBILITY FOR OVERSEEING AND IMPLEMENTING A NANOTECHNOLOGY ENVIRONMENTAL, HEALTH AND SAFETY RESEARCH STRATEGY ACROSS THE GOVERNMENT.

FOURTH, PUBLIC-PRIVATE PARTNERSHIPS ARE NEEDED THAT LEVERAGE GOVERNMENT AND INDUSTRY FUNDS TO ADDRESS CRITICAL NANOTECHNOLOGY OVERSIGHT ISSUES IN AN INDEPENDENT, TRANSPARENT AND TIMELY MANNER.

AND FINALLY, GOVERNMENT ACTIONS TO SUPPORT THE DEVELOPMENT OF SAFE NANOTECHNOLOGIES SHOULD BE TRANSPARENT.

WITHOUT TRANSPARENCY THERE IS NO CLEAR FOUNDATION FOR ENABLING STRATEGIC PLANNING, OR ENGENDERING TRUST WITHIN INDUSTRY OR THE PUBLIC.

I THINK IT IS FAIR TO SAY THAT TRANSPARENCY HAS BEEN AN ISSUE FOR SAFETY RESEARCH SO FAR WITHIN THE NATIONAL NANOTECHNOLOGY INITIATIVE. RECENTLY, THE NNI ANNOUNCED THAT \$68 MILLION WERE SPENT ON NANOTECHNOLOGY RISK-RELATED RESEARCH IN FISCAL YEAR 2006. BUT, AS HAS HAPPENED MANY TIMES NOW, NO CLEAR SUPPORTING DATA WERE GIVEN FOR THIS FIGURE.

SIFTING THROUGH RESEARCH CLAIMED TO BE RELEVANT TO NANOTECHNOLOGY SAFETY, I COULD FIND ONLY \$13 MILLION THAT WAS INVESTED IN RESEARCH THAT IS *HIGHLY RELEVANT* TO ADDRESSING THE

HEALTH AND ENVIRONMENTAL IMPACTS OF NANOTECHNOLOGY FOR 2006. THE SAME ANALYSIS FOR RESEARCH IN EUROPE REVEALS AN INVESTMENT OF \$24 MILLION IN NANOTECHNOLOGY SAFETY RESEARCH OVER THE SAME PERIOD.

UNLIKE THE NNI, THE INFORMATION THIS ANALYSIS IS BASED ON IS FREELY AVAILABLE ON THE WEB,¹ FOR ANYONE TO SEE AND VERIFY.

THE BOTTOM LINE HERE IS THAT, WITHOUT SUPPORTING EVIDENCE, ANY ASSESSMENT OF WHAT THE GOVERNMENT IS DOING TO ADDRESS NANOTECHNOLOGY IMPACTS IS NOT WORTH THE PAPER IT IS WRITTEN ON.

NANOTECHNOLOGY WILL NOT SUCCEED THROUGH WISHFUL THINKING. INSTEAD, IT WILL DEPEND ON CLEAR AND AUTHORITATIVE LEADERSHIP FROM THE TOP. THE PROPOSED NATIONAL NANOTECHNOLOGY INITIATIVE AMENDMENT ACT OF 2008 ADDRESSES EACH OF THE AREAS I HAVE JUST HIGHLIGHTED, AND IN MY PERSONAL OPINION SUPPORTS THE LEADERSHIP NECESSARY FOR THE SUCCESSFUL DEVELOPMENT OF SAFE NANOTECHNOLOGIES.

¹ <http://www.nanotechproject.org/inventories/ehs/>

I PARTICULARLY COMMEND THE COMMITTEE FOR PROMOTING TRANSPARENCY THROUGH A PUBLIC DATABASE OF RESEARCH. THIS WILL COMPLEMENT THE INTERNATIONAL PUBLIC DATABASE ON ENVIRONMENT, HEALTH AND SAFETY RESEARCH TO BE LAUNCHED BY THE ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT IN JUNE 2008.

I ALSO BELIEVE THE PROPOSED ACT TAKES AN IMPORTANT STEP IN ASSIGNING TO A SINGLE COORDINATOR THE RESPONSIBILITY FOR ENSURING THAT AN ADEQUATELY FUNDED AND LEVERAGED TOP-DOWN STRATEGIC PLAN FOR NANOTECHNOLOGY ENVIRONMENTAL, HEALTH AND SAFETY RESEARCH IS DEVELOPED AND IMPLEMENTED.

WHEN I LOOK BACK ON THE ORIGINS OF THE NATIONAL NANOTECHNOLOGY INITIATIVE, I AM IMPRESSED BY THE FORESIGHT AND QUALITY OF LEADERSHIP EXERTED BY CONGRESSIONAL VISIONARIES FROM BOTH SIDES OF THE AISLE, TOGETHER WITH THE PRESIDENT AND EXECUTIVE BRANCH, SCIENTISTS AND ENGINEERS, BUSINESSPEOPLE, AND EDUCATORS. BUT PERHAPS BECAUSE OF THE TREMENDOUS SUCCESSES ACHIEVED IN THE LABORATORY SINCE THE ITS CREATION, WE RISK LOSING SIGHT OF THE CHALLENGES INVOLVED IN TAKING THE NNI TO THE NEXT LEVEL OF RESEARCH, EDUCATION, GOVERNANCE AND COMMERCIALIZATION. IT IS MY BELIEF THAT WITH THE PROPOSED ACT—

AND WITH THE CONTINUED VIGILANCE OF THIS COMMITTEE—THIS WILL
NOT HAPPEN.

THANK YOU.