

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

Hearing on:

**“Research on Environmental and Safety Impacts of
Nanotechnology: Current Status of Planning and
Implementation under the National Nanotechnology Initiative”**

OPENING COMMENTS

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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 THIS HEARING.

MY NAME IS DR ANDREW MAYNARD. I AM THE 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.

A FEW YEARS AGO, NANOTECHNOLOGY WAS LITTLE MORE THAN THE STUFF OF SCIENTISTS' DREAMS. YET NOW IT IS BEING USED MORE AND MORE WITHIN PRODUCTS WE USE EVERY DAY. AND THE NANOMATERIALS THAT MAKE UP THESE PRODUCTS ARE AVAILABLE FOR ANYONE TO BUY AND USE.

FOR EXAMPLE, THIS BAG OF CARBON NANOTUBES WAS PURCHASED OVER THE INTERNET. ANYONE WITH A CREDIT CARD CAN PURCHASE SIMILAR MATERIAL, IN QUANTITIES RANGING FROM A FEW GRAMS TO HUNDREDS OF KILOGRAMS. AS THESE MATERIALS AND PRODUCTS BECOME MORE WIDESPREAD, THE QUESTION CONTINUES TO ARISE: "ARE WE DOING ENOUGH TO ENSURE THEY ARE SAFE?"

TAKE THESE CARBON NANOTUBES. ACCORDING TO COMPANY'S MATERIALS SAFETY DATA SHEET, THIS MATERIAL IS GRAPHITE—THE SAME STUFF THAT IS USED IN PENCIL LEADS—AND THE LISTED HEALTH PRECAUTIONS NO MORE THAN WHAT YOU WOULD TAKE FOR A NUISANCE DUST.

BUT UNDER CLOSER EXAMINATION, THESE CARBON NANOTUBES ARE AS SIMILAR TO PENCIL LEAD AS THE SOOT ON MY GRILL AT HOME IS TO DIAMONDS.

THIS IS WHAT SOME OF THE WORLD'S LEADING TOXICOLOGISTS WROTE IN THE JOURNAL *NATURE* LAST YEAR ABOUT CARBON NANOTUBES:

“ALTHOUGH IT IS NOT CLEAR WHETHER FIBRE-SHAPED NANOSCALE PARTICLES FORMED FROM CARBON AND OTHER MATERIALS WILL BEHAVE LIKE ASBESTOS OR NOT, SOME MATERIALS ARE SUFFICIENTLY SIMILAR TO CAUSE CONCERN: ANY FAILURE TO PICK UP ASBESTOS-LIKE BEHAVIOUR AS EARLY AS POSSIBLE WOULD BE POTENTIALLY DEVASTATING TO THE HEALTH OF EXPOSED PEOPLE AND TO THE FUTURE OF THE NANOTECHNOLOGY INDUSTRY.”

AS THIS PARTICULAR EXAMPLE ELOQUENTLY DEMONSTRATES, THERE IS A YAWNING KNOWLEDGE-GAP BETWEEN NANOMATERIALS ENTERING

COMMERCE NOW, AND WHAT WE KNOW ABOUT THEIR SAFETY. AND THIS UNCERTAINTY OVER HOW TO DEVELOP NANOTECHNOLOGIES SAFELY IS HAMSTRINGING REGULATORS, PARALYZING NANO BUSINESSES, AND CONFUSING CONSUMERS.

SO HOW DO WE BRIDGE THIS GAP? IN MY WRITTEN COMMENTS I CONSIDER WHAT WE NEED TO DO TO MOVE FORWARD, AND HOW THE GOVERNMENT'S ACTIONS MATCH UP TO THIS. BUT IN THE INTERESTS OF TIME, LET ME CUT TO THE CHASE HERE, AND GIVE YOU THE TOP SIX RECOMMENDATIONS ARISING FROM THIS ASSESSMENT:

FIRST, WE NEED A TOP-DOWN RESEARCH STRATEGY BY THE END OF THE YEAR AT THE LATEST. THIS MUST RESPOND TO OVERSIGHT CHALLENGES, AND IT MUST BE BACKED UP WITH AUTHORITY AND RESOURCES TO ENSURE ITS IMPLEMENTATION.

AS PART OF THIS STRATEGY, A FEDERAL ADVISORY COMMITTEE SHOULD BE ESTABLISHED TO ALLOW TRANSPARENT INPUT AND REVIEW FROM INDUSTRY, ACADEMIA, NON-GOVERNMENT ORGANIZATIONS AND OTHER STAKEHOLDERS.

SECOND, NEW MECHANISMS ARE NEEDED TO MAKE A STRATEGIC PLAN WORK. THESE MUST OVERCOME INSTITUTIONAL AND SCIENTIFIC

BARRIERS, AND ENSURE RESOURCES GET TO WHERE THEY ARE NEEDED TO GET THE JOB DONE. THEY MUST EMPOWER AGENCIES TO DO WHAT THEY DO BEST. AND THEY MUST PREVENT RESOURCES BEING SQUANDERED ON RESEARCH THAT IS ILL-CONCEIVED AND IRRELEVANT.

THIRD, 10% OF THE FEDERAL GOVERNMENT'S NANOTECHNOLOGY RESEARCH AND DEVELOPMENT BUDGET SHOULD BE DEDICATED TO GOAL-ORIENTED NANOTECHNOLOGY ENVIRONMENT, HEALTH AND SAFETY RESEARCH. A MINIMUM OF \$50 MILLION PER YEAR SHOULD GO TO TARGETED RESEARCH THAT DIRECTLY ADDRESSES SPECIFIC STRATEGIC CHALLENGES. THE BALANCE OF FUNDING SHOULD SUPPORT EXPLORATORY RESEARCH THAT IS CONDUCTED WITHIN THE SCOPE OF A STRATEGIC RESEARCH PROGRAM.

FOURTH. A PUBLIC-PRIVATE PARTNERSHIP SHOULD BE ESTABLISHED TO ADDRESS CRITICAL RESEARCH QUESTIONS. THIS SHOULD ENABLE GOAL-DRIVEN RESEARCH IN SUPPORT OF GOVERNMENT AND INDUSTRY OVERSIGHT, AND A COMMITMENT OF \$10 MILLION PER YEAR FOR THE NEXT FIVE YEARS SOUGHT; SPLIT EVENLY BETWEEN GOVERNMENT AND INDUSTRY.

FIFTH: A TARGETED PROGRAM OF PUBLIC ENGAGEMENT ON NANOTECHNOLOGY SHOULD BE ESTABLISHED THAT ENSURES TWO-WAY

COMMUNICATION BETWEEN THE DEVELOPERS OF THESE TECHNOLOGIES AND THE USERS.

AND FINALLY, TOP-LEVEL LEADERSHIP OF A SINGLE PERSON WITHIN THE FEDERAL GOVERNMENT IS NEEDED TO ENSURE APPROPRIATE ACTION IS TAKEN IN ADDRESSING THESE CHALLENGES.

MEMBERS OF THE NATIONAL NANOTECHNOLOGY INITIATIVE HAVE GREAT INTENTIONS TO DO THE RIGHT THING. BUT CONSIDERING WHAT IS AT STAKE HERE—THE QUALITY OF OUR ENVIRONMENT, THE VITALITY OF THE AMERICAN ECONOMY AND THE HEALTH OF PEOPLE LIKE YOU AND ME—GOOD INTENTIONS ARE NOT ENOUGH.

IT IS VITAL THAT WE TAKE ACTION NOW TO ENSURE A WORLD WHERE WE CAN NOT ONLY BUY ENGINEERED NANOMATERIALS LIKE THESE CARBON NANOTUBES, BUT WE CAN ALSO USE THEM WITHOUT FEAR OF HARM.

THANK YOU.