

International Association of Nanotechnology

The emerging field of nanotechnology is a hotbed of discussion. With so many applications – from nanomedicine to data storage systems – there is a need for an intermediary between nanotech researchers and government regulatory agencies. President **Lloyd L Tran** explains how the IANT is promoting collaboration in a bid to strengthen this exciting new arena and avoid any setbacks

To begin, can you explain the focus of the IANT?

At the IANT we are focusing on four primary areas:

- Fostering advanced technology and business development in nanotechnology
- Promoting responsible and beneficial applications of nanotechnology
- Training tomorrow's scientists, researchers and business leaders who can develop new nanotechnologies and products
- Collaborating with our partners to help develop international standards and regulatory framework, ensuring safety and protection of workers and the general public and avoiding potential misuse of new nanomaterials products

What strategy does the IANT employ to foster scientific research and business development in the area of nanoscience and nanotechnology for the benefit of society?

Through our annual International Congress of Nanotechnology meetings, seminars and workshops, we have been active in bringing together scientists, researchers, business leaders, government officials, NGOs and venture capitalists to share technology information, explore commercial applications and discussing various issues facing the deployment of new technologies.

Our executive team is actively involved in the development of nanotoxicology standards by working with other stakeholders such as ASTM International and the International Organization for Standardization (ISO). For example, ASTM has developed a new standard of safety guidelines, known as 'ASTM E2535 - 07 Standard Guide for Handling Unbound Engineered Nanoscale Particles in Occupational Settings'. We have been organising symposia to highlight issues related to the safety, environmental and ethical perspectives of nanotechnology applications. We have strived hard to promote a balanced view of nanotechnology and its impact on society at large. We normally invite a wide spectrum of experts including nanotechnologists, social scientists, business executives from around the world, and representatives from various government agencies such as the U.S. National Science Foundation, National Institutes of Health, National Institute of Standards, Environmental Protection Agency and the Department of Defense.

To what extent is IANT unique in the service it provides?

IANAT is a non-profit, non-political organisation promoting socially responsible frameworks, based on cooperative effort through our worldwide

membership. The Association was one of the first organisations to bring together nanotechnologists and business leaders, inviting them to share and collaborate with their colleagues from around the world. Even though we are located in the U.S., our scope is international and our philosophy is inclusive, transcending geography and political borders. Collaboration can help us to accomplish more with limited resources, and since we are exploring the new frontiers of science, we need to work together to solve the major challenges facing humankind, such as conquering diseases with nanomedicine, and solving the potential shortage of energy with nanomaterials.

As a non-profit organisation we have been working hard to maintain our independence, pursuing our own framework of core values in the midst of a changing environment. In some instances, we voiced our concerns regarding the usage of nanomaterials for destructive purposes, and back in 2005, we expressed our reservations about the massive funding by the Bush Administration – US \$50 million – to establish the Institute for Soldier Nanotechnologies at the Massachusetts Institute of Technology. We believed the money could be better spent on applications for the benefit of the common good, rather than for military purposes.

Nanotechnology is a very broad subject area, ranging from technology development to commercialisation, and from nanotoxicology to the ethical and societal impact of this emerging industry. How does the IANT ensure that it maintains its focus and fosters scientific research and business development across the entire nanotechnology arena?

To foster an emerging field with a wide range of disciplines, we are working with many subject experts who serve on the advisory board of the Association. Our large network of scientific and business advisors enables us to reach out to a high number of stakeholders worldwide – from those involved in scientific research, commercialisation applications, and environmental and health and safety issues, to the societal and ethical implications of nanotechnology.

Thanks to a grant under the U.S. Department of Labor, the Association has successfully developed a curriculum to train a new generation of nanotechnologists. Over the past three years, we have trained more than 325 scientists, engineers and business executives who have completed a Certificate Program in Nanoscience and Nanotech Business Re-engineering at the California Institute of Nanotechnology Training Center.

Having said that, it is a challenge for me to keep up with the fast-growing knowledge base and new developments in this exciting field. Besides my work as the President of the Association, I am working on my own research in the development of new nano-pharmaceuticals for treatment of Alzheimer's

disease as well as new nanomaterials for Lithium Air battery technology. By conducting my own research projects, I am able to relate with and appreciate the challenges my colleagues around the world are facing with their own research and business activities.

By what means is the IANT helping to engender friendship, equality and cooperation amongst its members around the world?

The Association has been organising the International Congress of Nanotechnology over the past eight years to build a bridge of friendship and collaboration amongst its members around the world. The Congress presents state-of-the art scientific discoveries, new product development, intellectual property and technology transfer, venture capital investment, safety, regulation, ethics, and environmental and societal aspects of nanotechnology. Normally we have 35-40 teams of delegates from around the world participating in the discussion at the Nanotechnology Congress.

Could you outline the societal aspects and impacts of nanotechnology?

Nanotechnology is not a product, but a new paradigm method that harnesses the unique properties of materials at the 1-100 nanometre scale. Nanotechnology is designed to develop new products with novel properties, capable of providing solutions to problems that cannot be solved on the macro scale.

The major benefits of nanotechnology include improved nanomedicine, nanopharmaceuticals, nano-manufacturing methods, nanomaterials for advanced battery-storage systems, nano-electronic components for computer and data-storage systems, better food production methods and nutrition, and lighter and stronger nano-composites in various industrial applications. As a new frontier, nanotechnology holds promise to greatly improve the quality of life, but, as with any frontier, there are some unknowns. As history attests, new technological developments often bring with them potentially negative side effects. Some of these latent risks include environmental and health and safety issues, the military application of nanomaterials for chemical and biological warfare, and surveillance through nanosensors – these are all a concern.

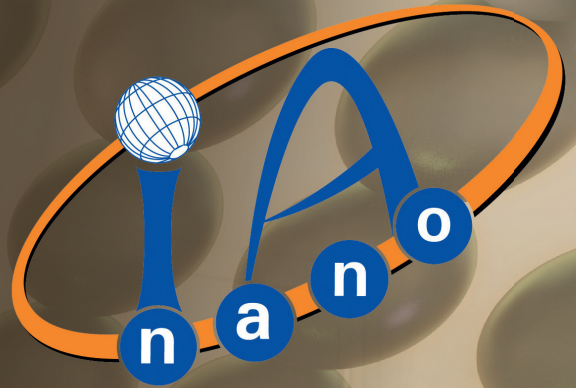
Whether nanotechnology merits special government regulation is a controversial issue that requires discussion, but regulatory bodies such as the U.S. Environmental Protection Agency, the State of California Department of Toxic Substances Control and the Health and Consumer Protection Directorate of the European Commission have proposed new sets of regulatory frameworks concerning the potential risks of nanoparticles.

Since many of our member companies are producing carbon nanotubes and other nanomaterials, the executives from the companies believe that any kind of government regulation frameworks could hinder their research and commercialisation, thus increasing the costs of business. As an industry association, we have served as an intermediary between nanotech companies and government regulatory agencies, helping our members reach amicable solutions. In fact, we have been working closely with the Department of Toxic Substances Control (DTSC), within the California Environmental Protection Agency since 2005, and have organised symposium and seminars as a part of our outreach initiatives to facilitate communication between our industry members and the California EPA.

We believe as the industry grows and becomes more mature, government regulation will become an intrinsic part of conducting business. Rather than avoiding these controversial aspects, the Association has developed a set of proposed regulatory frameworks that allow us to work with all stakeholders, while protecting the best interests of our community and society at large.

What future plans do you have for the IANT and in what way will they bolster the field of nanotechnology?

Our strategic plan calls for us to expand our scope of activities worldwide by forming partnerships with many member organisations to help them establish their national associations and local groups. We have found that many of our overseas members are facing similar challenges to the U.S. We believe that with our network of partners and members we can achieve our goal of fostering nanotechnology and its benefits to the global village we now live in, and for the success of future generations.



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