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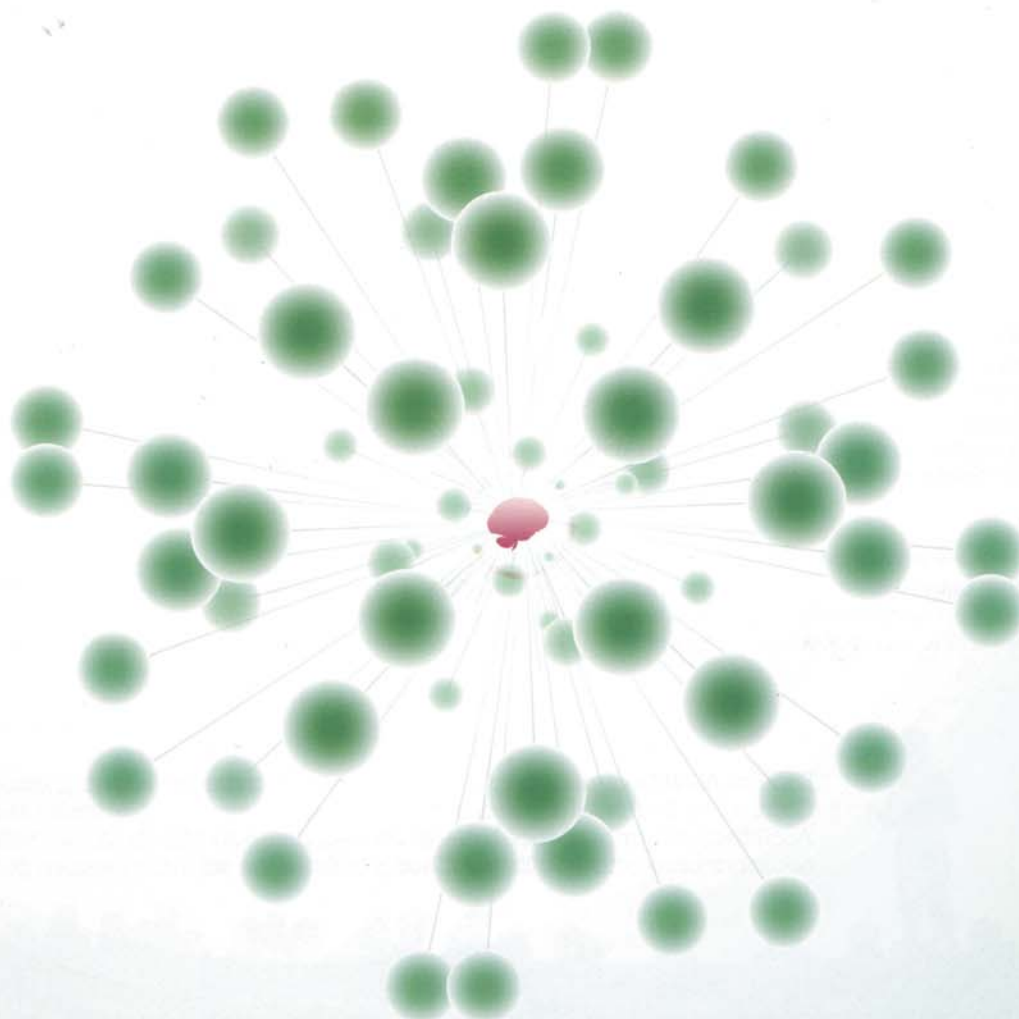
**Ministry of Research  
and Innovation:** Ontario

### RESEARCH SPOTLIGHT

Canadian Institutes of Health Research  
Arbor Research Collaborative for Health  
American Society for Nanomedicine  
Max Planck Institute of Molecular Cell  
Biology and Genetics  
Innovative Medicines Initiative

# The American Society for Nanomedicine

Founded in 2008, the Society is relatively young. Acting President, **Dr Esther Chang**, discusses how, in just under four years, its members have managed to make a mark in the field of nanomedicine



**The American Society for Nanomedicine (ASNM) is a professional, academic and medical non-profit organisation comprising members from the fields of nanotechnology, engineering and biomedical sciences. What are the main objectives of the Society?**

The Society's mission is the advancement of seminal research to unlock the potential of nanomedicine to benefit global health. While there are other societies encompassing nanotechnology more broadly, our focus is nanotechnology-based clinical applications, ie. nanomedicine. We emphasise the innovation and practicality of approaches for speedy translation into improved diagnosis, treatment and prevention of diseases. This is being accomplished through fostering an open forum of ideas and collaborative efforts in nanomedicine communities worldwide.

**Could you provide a brief overview of your duties as Acting President?**

Along with 10 other board members, I have been instrumental in setting the direction and goals of the ASNM over the past several years, and have also been involved with drafting bylaws. I was the principal organiser of

the Society's first, second and third annual meetings in 2009, 2010 and 2011. As Acting President, my role is to emphasise our goals and set the overall theme for each of these meetings in translational and clinical nanomedicine. I try to ensure the participation of high quality speakers, as well as planning and executing the meetings.

In addition, I serve as the liaison between the ASNM, our international counterparts and our funding entities. And, together with the other founding director, Dr Raj Bawa, I oversee the Society's management in order to further its mission and ensure the integrity of its finances.

**What is the purpose of the ASNM bylaws?**

The ASNM bylaws are a means, not an end unto themselves. ASNM is a non-profit, open, democratic and transparent professional society, focusing on cutting-edge research in nanomedicine for the prevention, diagnosis and treatment of human diseases. The Society has been focusing on translational and clinical research in nanomedicine. On various occasions, we encounter new issues, and the bylaws help guide us in their resolution.

### The Society encourages the advancement of translational and clinical applications of nanomedicine. What are the target diseases at the forefront of ASNM research?

Although the main focus of the Society is nanomedicine for all diseases, we have been investigating specific disease themes in each of our annual meetings. Cancer was the overall theme of the first and third annual meetings; infectious diseases (HIV/AIDS) were the main focus for the second; and the fourth annual meeting, taking place in March 2014, will centre on neuronanomedicine. The meeting will be chaired by Dr Howard Gendelman from the Department of Pharmacology and Experimental Neuroscience, University of Nebraska Medical Center, in collaboration with National Institutes of Health (NIH) National Institute of Neurological Disorders and Stroke. The Society's members are, and have been, leaders in nanomedicine research, addressing issues relating to a variety of diseases.

### You will be a Distinguished Speaker at the fourth annual meeting, representing the Lombardi Comprehensive Cancer Center and Georgetown University Medical Center. What points do you hope to raise that are pertinent to the field of oncology?

I will be presenting our studies on a treatment strategy for recurrent glioblastoma. We have developed a nanocomplex that crosses the blood-brain barrier (BBB) and carries the tumour suppressor gene p53 (SGT53), which is currently in clinical trials for various types of solid tumour. It has been shown that when systemically administered, this nanomedicine specifically targets primary and metastatic tumours throughout the body. Because of the specific targeting moiety incorporated as part of this nanomedicine, it also efficiently crosses the BBB to target tumours in the brain. Historically, these have been major challenges for the delivery of cancer therapy.

Brain cancers, like glioblastoma, are some of the most lethal forms of cancer. The percentage of brain cancer patients who survive five years post diagnosis is still less than 4 per cent, which is largely due to tumour recurrence. Since cancer stem cells (CSCs) have been implicated in

recurrence and resistance in many human cancers, including glioblastoma, an effective cancer treatment must be able to target and eliminate CSCs. We have found that SGT53 not only targets glioblastoma, but also targets and efficiently delivers its therapeutics to CSCs in these tumours. This treatment may open the possibility of reducing tumour recurrence and increasing patient survival.

### What role does ASNM play in tackling issues such as ethics, toxicity, patents and commercialisation?

ASNM strives to bring people together from different disciplines to discuss these crucial issues. In each of the annual meetings, we have hosted sessions addressing these topics. In fact, the fourth annual meeting will host a session entitled 'Legal, developmental, scientific and regulatory obstacles for product translation'.

### By what means does ASNM plan to facilitate the establishment of patient programmes and policies that contribute to early diagnosis and treatment?

The Society is interested in facilitating certain aspects of patient programmes and policies that contribute to early diagnosis and treatment. Members have been involved in various programmes, working groups and task forces that have influenced policy and have implications for opportunities in nanotechnology at the federal and state levels. For example, the Maryland Task Force to Study Nanobiotechnology positioned nanobiotechnology as one of the state's highest scientific priorities.

Through research, many of the Society's members and board members have been actively involved in novel translational work in diagnostics and treatment for a variety of diseases. A number of therapies, diagnostics and devices have been evaluated in clinical trials, and some of them are being commercialised.

This ASNM goal will also be accomplished through an open forum of ideas between nanomedicine communities worldwide, supported by government stakeholders who fund nanomedicine research. We have good evidence to

## A brain event



Each of ASNM's annual conferences focuses on a specific scientific discipline. Chaired by Dr Howard Gendelman from the University of Nebraska Medical Center, ASNM's fourth annual meeting – to be held on 28-30 March, 2014 – will centre on neuronanomedicine. **Dr Esther Chang** outlines the scientific sessions planned:

Neuronanomedicine is a new research field defined as the development and translation of nanotechnology for diagnosis and treatment of degenerative, malignant, inflammatory, infectious, vascular, addictive, behavioural and metabolic disorders of the nervous system. The research discipline is interdisciplinary and in its infancy. Hurdles – BBB restrictions, nanotoxicologies, and inefficient drug targeting of diseased brain regions and specific neural subcellular compartments – need to be overcome for success to be realised. These all pose significant challenges to the field.

In this fourth meeting, delivery, diagnostic, pathobiologic and therapeutic issues will be covered, providing a lively environment for discussion on how nanomedicines and nanomaterials can be used to positively affect malignant, neurodegenerative, inflammatory, addictive and neuroinfectious disorders.

### Sessions will cover the following topics:

- Central nervous system drug formulation and design, targeted delivery and toxicology
- Diagnostics at the nanoneural interface
- Nanoimaging for degenerative, inflammatory, infectious diseases and tumours of the nervous system
- Mechanisms for protein misfolding
- Alzheimer's, Huntington's and Parkinson's diseases
- Neuroregenerative medicine
- Novel therapeutics
- Nanotechnology for HIV eradication
- Developmental, legal, and US Food and Drug Administration (FDA) regulatory issues for product translation

show that a number of fruitful collaborations resulted from interactions fostered at the annual meetings.

**The education of physicians, scientists, engineers, molecular biologists, statisticians and others interested in the burgeoning field of nanomedicine is imperative to research progression. How does ASNM mentor students and professionals?**

ASNM brings together seasoned professionals, leaders in the field and younger researchers from diverse backgrounds to exchange research strategies, recent findings and technical challenges relating to their latest investigations. We strongly believe that we must engage the next generation of researchers in nanomedicine and, in annual meetings, we emphasise the participation of young and underrepresented groups in advancing this field, particularly through the establishment of Young Investigator Awards and travel fellowships. Our Society also emphasises equal representation of genders and backgrounds.

**Has ASNM encountered any challenges since its inception? How have these challenges been overcome?**

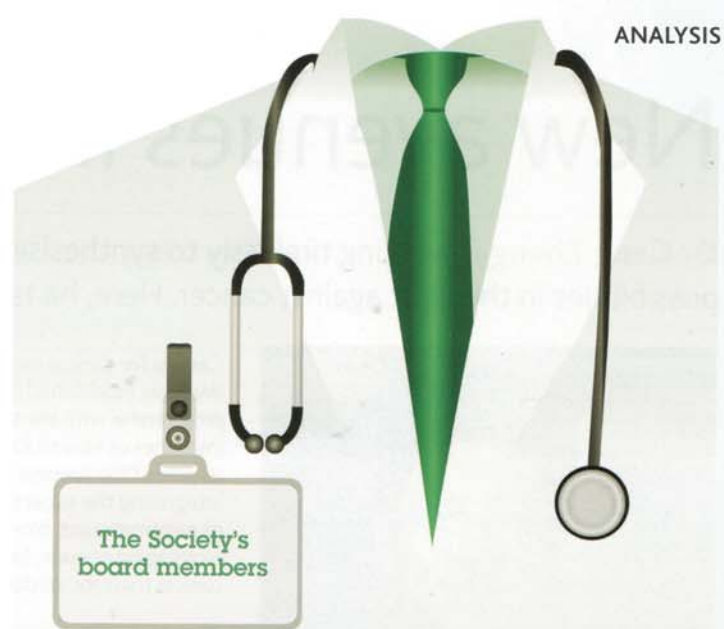
ASNM is a young organisation, but we are beginning to become well-known in the nanotechnology/nanomedicine field. Adequately promoting the Society and expanding its membership has been challenging, yet our Board and highly-involved members have been able to increase the visibility of the Society.

**In what manner has collaboration and coordination with international colleagues contributed to the advancement of the nanomedicine research field?**

Representing the ASNM, I am an executive board member and one of the six founding members of the International Society for Nanomedicine (ISNM) in Basel, Switzerland, which was established in 2009. Several other ASNM board members are also board members of the ISNM. They, and other ASNM members have been attending and contributing to various international conferences on nanotechnology/nanomedicine. Similarly, many international colleagues, including leaders in the field, are able to join us at our annual meetings as speakers and/or attendees. A number of research projects and joint papers are manifestations of collaborations between international colleagues.

In addition, I serve as Chair of the International Advisory Board for the Lundbeck Foundation Center for Nanomedicine in Copenhagen (NanoCAN). A number of American and European key investigators in nanomedicine have served on the Advisory Board, which encourages strong exchange and collaboration.

[www.amsocnanomed.org](http://www.amsocnanomed.org)



**Representing leadership and diverse expertise in the field of nanomedicine are:**

**Lajos P Balogh, PhD**

Editor-in-Chief, *Nanomedicine: Nanotechnology, Biology and Medicine* (Elsevier)  
AA Nanotechnology Consulting, Amherst, New York, USA

**Raj Bawa, PhD**

President and Patent Agent, Bawa Biotech LLC, USA  
Adjunct Professor, Rensselaer Polytechnic Institute, USA  
Scientific Advisor, Teva Pharmaceutical Industries, Ltd., Israel

**Michelle Bradbury, MD PhD**

Associate Attending, Department of Radiology, Memorial Sloan-Kettering Center, USA

**Esther H Chang, PhD**

Professor, Department of Oncology, Lombardi Comprehensive Cancer Center, Georgetown University Medical Center, USA

**Wah Chiu, PhD**

Distinguished Service Professor  
Director, National Center for Macromolecular Imaging, Baylor College of Medicine, USA

**Omid Farokhzad, MD**

Associate Professor, Harvard Medical School, Brigham and Women's Hospital, USA

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Canada Research Chair in Bionanotechnology and Nanomedicine,  
Professor of Pharmaceutical Sciences, University of Waterloo, Canada

**Howard Gendelman, MD**

Margaret R Larson Professor of Internal Medicine and Infectious Diseases  
Chair, Department of Pharmacology and Experimental Neuroscience, Center for Neurodegenerative Disorders, University of Nebraska Medical Center, USA

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