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\$70 million global research institute launched in the emerging field of nanomedicine

(*Nanowerk News*) Northwestern University's International Institute for Nanotechnology (IIN) is collaborating with Nanyang Technological University (NTU), Singapore, to establish the NTU-Northwestern Institute for Nanomedicine. Both universities are putting in substantive investments in this multi-million dollar research institute that will focus on the medical application of nanotechnology.

The medical field is an area where nanotechnology is expected to have the most profound impact and benefit to society, and the new NTU-Northwestern Institute for Nanomedicine is poised to realise significant advances. The new institute will support a global group of scientists working on joint research projects in the areas of disease diagnostics, timed-release therapeutics, and targeted drug delivery methods, which would greatly increase the efficacy of existing drugs. Researchers will also design new methodologies, such as gene silencing and theranostics, to treat diseases.

NTU President, Professor Bertil Andersson announced the collaboration on February 17th at the annual American Association for the Advancement of Science (AAAS) meeting held in Chicago. "This partnership with Northwestern and their International Institute for Nanotechnology is a testament of NTU's growing reputation as a new powerhouse in nanomedicine research," Professor Andersson said.

"The world-class expertise of Professor Chad Mirkin and his colleagues within the Northwestern International Institute for Nanotechnology, in biodetection and in nanotherapeutics, is a perfect match for NTU's expertise in drug delivery systems and biomaterials engineering. The future in the delivery of drugs is in nanomedicine which allows the medicine to be conveyed to the intended location that needs treatment," said Professor Andersson. "In short, it's medicine delivery with a postal address."

"This is a great opportunity to capitalise on the strengths of two outstanding universities to use nanotechnology to explore solutions to some of the most devastating medical problems," stated Northwestern President, Professor Morton Schapiro. "This partnership is a wonderful example of Northwestern's commitment to engage internationally in ways that will heighten global impact for the greater good."

Professor Chad Mirkin, Director of the IIN, George B. Rathmann Professor Chemistry, and scientific advisor to United States President Barack Obama; along with Professor Vinayak Dravid, IIN Director of Global Partnerships, Abraham Harris Professor Materials Science and Engineering, and Director Northwestern University's Atomic and Nanoscale Characterisation Experimental Center, will lead the Institute's effort at Northwestern.

"We have enjoyed a longstanding relationship with NTU. The commitment of both institutions in the establishment of this important new Institute for Nanomedicine will strengthen and expand the existing ties and provide a fertile foundation for exciting new medical advancements," said Professor Mirkin. "We are very much looking forward to working with our colleagues both here and at NTU to launch this new endeavour," said Professor Dravid.

NTU Provost, Professor Freddy Boey, a long-time collaborator of Professor Mirkin, said, "Northwestern University and NTU go back a long way. We have previously worked together on various research projects. This new

Institute formalises our relationship and takes it to a higher level.”

Northwestern Provost, Professor Daniel Linzer added, “Successful collaborations between academic institutions require significant and enduring faculty involvement. Northwestern and NTU faculty have been collaborating for many years now. We are delighted to work with NTU in the formation of the Institute and look forward to our faculty and students conducting research that yields a significant impact on human health.”

NTU is a research-intensive university with an international outlook, with remarkable success translating research into innovative applications. It has a student population of 33,500, with programs taught in English. It was recently ranked 41st globally by higher education information provider Quacquarelli Symonds. NTU is also ranked No. 1 in the world by Times Higher Education in industry income and innovation.

Some of the existing cutting-edge research projects at NTU include the new anti-glaucoma nanomedicine, Lipolat, which is undergoing clinical trials. Injected only twice yearly to replace the current daily eye drops, this nanomedicine reduces high eye-pressure, which if left untreated can lead to blindness. Another nanomedicine project is a new drug-eluting balloon. When coated with a gel, it can deliver drugs over a long period of time to prevent re-occurrence of cardiovascular plaque that narrow the arteries. This unique gel contains millions of timed-release nano-sized capsules which have anti-restenotic drugs in them to help prevent the re-narrowing of arteries after it has been widened.

Northwestern’s IIN is an umbrella organisation that catalyses and supports interdisciplinary research focused on the development of transformative nanotechnologies including nanomedicine. Established in 2000, the IIN is home to the first federally funded nanotechnology facility in the nation; currently represents and unites over S\$600 million in nanotechnology research, education, and infrastructure; and has positioned Northwestern as a world leader in the field.

Some of the remarkable research projects currently in various stages of development at the IIN include: a diagnostic system that detects disease-causing viruses and bacteria, as well as genetic mutations, with greater sensitivity and accuracy than ever before; a drug-delivery system that allows physicians to successfully combat inflammation after open-heart surgery; and skin moisturisers with gene regulators capable of penetrating deep into the skin and turning “off” disease-causing genes—a technology that has great potential for life-saving therapies for skin cancers. The IIN unites over 190 faculty experts from 25 different disciplines and major state-of-the-art facilities, all of which will greatly advance the collaborative research and translational medicine of this new Institute.

Source: *Nanyang Technological University*