

**JACKIE Y. YING**

EXECUTIVE DIRECTOR

## BIOGRAPHICAL SUMMARY



Jackie Y. Ying was born in Taipei, and raised in Singapore and New York, and graduated with B.E. *summa cum laude* in Chemical Engineering from The Cooper Union in 1987. As an AT&T Bell Laboratories Ph.D. Scholar at Princeton University, she began research in materials chemistry, linking the importance of materials processing and microstructure with the tailoring of materials surface chemistry and energetics. She pursued research in nanocrystalline materials with Prof. Herbert Gleiter at the Institute for New Materials, Saarbrücken, Germany as NSF-NATO Post-doctoral Fellow and Alexander von Humboldt Research Fellow. She joined the Chemical Engineering faculty at Massachusetts Institute of Technology (MIT) in 1992, and became its youngest Full Professor at the age of 35 in 2001.

Prof. Ying is currently the Executive Director of the Institute of Bioengineering and Nanotechnology (IBN), Singapore. IBN is a multidisciplinary institute founded by Prof. Ying in March 2003 to advance the frontiers of engineering, science and medicine; it has grown to 150 research staff under Prof. Ying's leadership. IBN's research is focused on nanomedicine, synthetic biosystems, biodevices and diagnostics, and green chemistry and energy. Over 1,260 papers have been published by IBN staff in leading scientific journals. IBN's innovative research has led to over 685 patents and patent applications, 131 of which have been licensed. This national research institute has spun off 12 start-up companies. It has trained 122 Ph.D. students. Its Youth Research Program has actively reached out to over 103,000 students and teachers from 290 local and overseas schools/universities through open houses, workshops and seminars. IBN staff has mentored over 2,500 students and teachers in full-time research internships for a period of at least 1 month.

Prof. Ying's research is interdisciplinary in nature, with a theme in the synthesis of advanced nanostructured materials for biomaterial and catalytic applications. Her laboratory has been responsible for several novel wet-chemical and physical vapor synthesis approaches that create nanocomposites, nanoporous materials and nanodevices with unique size-dependent characteristics. These new systems are designed for applications ranging from biosensors and diagnostics, nanomedicine and targeted delivery of drugs, cell culture substrates and biomaterials, *in vitro* toxicology and drug screening, pharmaceuticals and chemicals synthesis, to battery and fuel cells. Prof. Ying has authored over 350 articles with more than 21,900 citations (*h* index: 70). She has presented over 440 invited lectures at international conferences, and 110 invited seminars at universities and institutions.

Prof. Ying has been recognized with a number of research awards, including the American Ceramic Society Ross C. Purdy Award for the most valuable contribution to the ceramic technical literature in 1993, David and Lucile Packard Fellowship, Office of Naval Research Young Investigator Award, National Science Foundation Young Investigator Award, Camille Dreyfus Teacher-Scholar Award, Royal Academy of Engineering ICI Faculty Fellowship, American Chemical Society Faculty Fellowship Award in Solid-State Chemistry, Technology Review's Inaugural TR100 Young Innovator Award, American Institute of Chemical Engineers (AIChE) Allan P. Colburn Award for excellence in publications, World Economic Forum Young Global Leader, and *Chemical Engineering Science* Peter V. Danckwerts Lectureship.

Prof. Ying was inducted to the German National Academy of Sciences, Leopoldina in 2005 as the youngest member of the Academy. She was named one of the "One Hundred Engineers of the Modern Era" by AIChE in its Centennial Celebration, and honored with the Great Woman of Our Time Award for Science and Technology by Singapore Women's Weekly. She was the first recipient of the Singapore National Institute of Chemistry-BASF Award in Materials Chemistry. She received the Service to Education Awards from the Ministry of Education, Singapore in 2011 and 2015. She led the invention on MicroKit, which received the 2011 Asian Innovation Silver Award from the *Wall Street Journal Asia*. She was recipient of the International Union of Biochemistry and



Molecular Biology (IUBMB) Jubilee Medal in 2012. Prof. Ying was selected by The Muslim 500 in 2012, 2013, 2014, 2015, 2016 and 2017 as one of the world's 500 most influential Muslims. She was elected as a Materials Research Society Fellow in 2013, a Royal Society of Chemistry (U.K.) Fellow in 2014, an American Institute for Medical and Biological Engineering Fellow in 2015, an American Association for the Advancement of Science Fellow in 2015, and a Singapore National Academy of Science Fellow in 2016. She was selected as an Inaugural Inductee for the Singapore Women's Hall of Fame in 2014. She received the Crown Prince Grand Prize and the ASEAN New Invention and Innovation First Prize in the Brunei Crown Prince Creative, Innovative Product and Technological Advancement (CIPTA) Award, and the Medal of Honor from the Academy of Sciences of Iran in 2015. She was the inaugural winner of the Mustafa Prize "Top Scientific Achievement Award" in 2015 for her research in bio-nanotechnology. The laureate of this science and technology award receives a certificate, an engraved medal and US\$500,000 in prize money. Prof. Ying led the invention on Dengue Test Kit, which was named one of top 50 innovations in Singapore for 1965–2015 (INNOVATI50N). She was recognized with the Ibrahim Memorial Award of Islamic World Academy of Sciences-COMSTECH (2015), the Gano Dunn Award of The Cooper Union Alumni Association (2016), The Cooper Union Alumni Hall of Fame (2016), and Abdeali Tayebali Lifetime Achievement Award (2017).

Prof. Ying serves on the Advisory Board of the Society for Biological Engineering. She is on the Scientific Advisory Board of Molecular Frontiers (a global think tank that promotes molecular sciences), King Abdullah University of Science and Technology Catalysis Center, and National University of Ireland Galway Centre for Research in Medical Devices (CÚRAM). She is appointed to the Governing Board of Mechanobiology Institute and the International Advisory Panel of Brunei Technological University. She is an Honorary Professor of Jilin University (China) and Sichuan University (China), and an Adjunct Professor of National University of Singapore.

Prof. Ying was appointed by the U.S. National Academy of Engineering in 2006 to serve on the blue-ribbon committee that identified the grand challenges and opportunities for engineering in the 21st century. She was a member of the International Advisory Board of University of Queensland Nanomaterials Centre (Australia), Leibniz-Institut für Festkörper- und Werkstofforschung Dresden (Germany), and National Research Council Steacie Institute for Molecular Sciences (Canada). She was a founding member of the Board of Directors of Alexander von Humboldt Association of America. She was an Adjunct Professor of Nanyang Technological University (Singapore) and King Saud University (Saudi Arabia).

Prof. Ying is the Editor-in-Chief of *Nano Today*. Under Prof. Ying's leadership, *Nano Today* underwent a successful transition from a magazine to a journal, witnessing major increases in the Impact Factor from 5.929 in 2007 to 13.157 in 2015 (Thomson Reuters *Journal Citation Reports*®). *Nano Today* now ranks 5th among the 83 journals in the ISI Nanoscience and Nanotechnology category, 10th among the 271 journals in the Materials Science (Multidisciplinary) category, and 9th among the 163 journals in the Chemistry (Multidisciplinary) category. It is the only Asia-based journal in the top 10 journals in these three categories.

In addition, Prof. Ying is Advisory Editor for *Materials Today* and *Molecular and Supramolecular Science*, Honorary Editor of *Biomaterials and Biodevices*, Associate Editor of *The Nanotechnology and Nanoscience*, and Regional Editor of *Current Bionanotechnology*. She serves on the Honorary Advisory Board of *Journal of Biomaterials and Tissue Engineering*, and the Editorial Board of *Journal of Porous Materials*, *Nanoparticle Science and Technology*, *Journal of Metastable and Nanostructured Materials*, *Journal of Experimental Nanoscience*, *Biomolecular Frontiers*, *International Journal of Molecular Engineering*, *Wiley Interdisciplinary Reviews: Nanomedicine and Nanobiotechnology*, *Materials Science and Engineering C: Materials for Biological Applications*, *Journal of Biomedical Nanoscience and Nanotechnology*, *Nano Research*, *Cambridge Series in Chemical Engineering*, *Macromolecular Bioscience*, *Biomicrofluidics*, *The Open Catalysis Journal*, *Nano: Letters and Reviews*, *Nanoscience and Nanotechnology – Asia*, *American Journal of Nuclear Medicine and Molecular Imaging*, *Nano Energy*, *Nano Energy and Nano Environment*, and *Journal of Molecular and Engineering Materials*, *Biomaterials Science*, *Trends in Molecular Medicine*, *Materials Horizons*, *ACS Sustainable Chemistry & Engineering*, *Applied Materials Today*, *Bioengineering and Translational Medicine*, and *Journal of Emerging Infectious Diseases*.

Prof. Ying has over 170 primary patents granted or pending, 32 of which have been licensed to multinational and start-up companies. She has served on the Board of Directors and/or Advisory Boards of 10 start-up companies and 2 venture capital funds. One of the spin-off companies that she co-founded, SmartCells, Inc., has developed a technology platform that is capable of auto-regulating the release of insulin therapeutic depending on the blood glucose levels. Merck acquired SmartCells, Inc. in 2010, with milestone-based aggregate payments in excess of US\$500 million to further develop this nanomedicine for clinical trials.