For Immediate Release

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MEDIA RELEASE

IBN's Professor Jackie Y. Ying, Named One of "One Hundred Engineers of the Modern Era"

SINGAPORE, DECEMBER 1, 2008 — IBN Executive Director Professor Jackie Y. Ying was recognized as one of "One Hundred Engineers of the Modern Era"[1] at the American Institute of Chemical Engineers (AIChE) Centennial Celebrations in 2008. This list honors 100 engineers who have made significant contributions to the profession after World War II. The Awards and Recognition Subcommittee of AIChE's Centennial Celebrations developed this list using multiple secret ballots with a special review panel from nearly 1,000 names considered. The AIChE list recognizes chemical engineers in three broad categories: their achievement; leadership and new frontiers.

IBN's Professor Ying was listed for breaking ground in new frontiers on nanostructure manipulations; nanoporous materials and host matrices for quantum dots and wires. Other chemical engineers on this list include Professor James E. Bailey (1944-2001), recognized for his achievement as the father of modern bioprocess engineering and IBN Scientific Advisory Board Member, Professor Klavs Jensen, for his leadership in the field of chemical and biological microsystems. Professor Ying shared, "Some of the world's greatest inventions and scientific breakthroughs that will transform our lives are being made possible by the work of chemical engineers. It is therefore an honor to be part of this great tradition. At our Institute, engineers work alongside doctors and other scientists to develop new biomaterials and technologies that aim to make medical treatment more effective, less painful and more affordable for patients."

In its 100th year, AIChE also looked to the past to name 50 Engineers of the Foundation Age who were active up to the Second World War, including visionaries such as solar energy pioneer Hoyt C. Hottel (1903-1987) and Leo Baekeland (1863-1944), inventor of Bakelite and Velox photography paper. In looking ahead to the future, AIChE called on 25 thought leaders, including Professor Ying, for their vision for the future of chemical engineering[2].

Representing individuals who are truly at the cutting edge of advances in chemical engineering, Professor Ying's experiences contribute towards an independent view of the overall potential of research. While chemical engineering continues to address the great challenges faced by mankind in the coming century, Professor Ying

[1] Chemical Engineering Progress (CEP), AIChE, October 2008, Vol. 104, No. 10
[2] CEP, AIChE, November 2008, Vol. 104, No. 11

addressed urgent needs for the sustainability of civilization and quality of medical care, “our current dependency on fossil fuels has led to increasing demands on a diminishing source of energy, as well as global warming effects that threaten major climate changes. We need to develop alternative forms of energy, such as solar energy and biomass, and make them viable and affordable.”

Expanding on the need for new technologies to manage environmental issues, Professor Ying added, “We should also create approaches that would enable the fixation of carbon dioxide, and better still, convert this greenhouse gas to a useful form of energy. Nanostructured materials have a role to play in these emerging platforms. To render solar cells cost-effective and highly efficient, we would need to design and process novel nanocomposite systems. To convert biomass and carbon dioxide into practical forms of energy and useful petrochemicals, we would require new advances in catalytic chemistry and processes, most likely based on nanocomposite catalysts.”

Chemical engineers would also contribute significantly towards the development of healthcare in the future. According to Professor Ying, “chemical engineers can make a significant impact in engineering better medicine. This would involve the diagnosis of diseases at an early stage, and optimal treatment to individual patients. The former will require combined advances in nanosensors, nanofluidic devices, genomics and bioinformatics. The latter can take the form of smart drug delivery and regenerative medicine. For example, nanoparticles are being developed to target chemotherapeutics in killing cancer-specific cells, instead of creating horrible systemic side effects. Nano-biomimetic scaffolds may be constructed to guide the differentiation of one's own stem cells to regenerate damaged tissues and organs *in vivo*.”

In the next 25 years, chemical engineering can be expected to build on current advances in energy and biomedical research through their “ability to engineer at the molecular, nanoscopic, microscopic and macroscopic length scales, and integrate the complex, multiscale processes involved,” Professor Ying added. As its full potential begins to be better understood, nanotechnology can be applied across a wide range of industries from healthcare to consumer goods to fuels.

For interview requests with Professor Jackie Y. Ying, please contact

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About the Institute of Bioengineering and Nanotechnology

The Institute of Bioengineering and Nanotechnology (IBN) is a member of the Agency for Science, Technology and Research (A*STAR), Singapore. It was established in 2003.

Massachusetts Institute of Technology (MIT) Professor Jackie Yi Ru Ying, 42, was hand-picked by A*STAR Chairman Philip Yeo to lead the institute as its Executive Director in March 2003. She has been on MIT's Chemical Engineering faculty since 1992, and was promoted to Professor in 2001. She is among the youngest to be promoted to this rank at MIT. Under her direction, IBN conducts research at the cutting-edge of bioengineering and nanotechnology. Its programs are geared towards linking multiple disciplines across all fields in engineering, science and medicine to produce research breakthroughs that will improve healthcare and our quality of life.

IBN's research activities are focused in the following areas:

- **Drug and Gene Delivery,** where the controlled release of various therapeutics involve the use of functionalized polymers and hydrogels for targeting diseased cells and organs, or for responding to specific biological stimuli.
- **Cell and Tissue Engineering,** where biomimicking materials, stem cell technology and bioimaging are combined to develop novel approaches to regenerative medicine and artificial organs.
- **Pharmaceuticals Synthesis and Nanobiotechnology,** which encompass the efficient catalytic synthesis of chiral pharmaceuticals, and new materials for sustainable technology and alternative energy generation.
- **Biosensors and Biodevices,** which involve nanotechnology and microfabricated platforms for the detection and treatment of diseases, and the synthesis and screening of biologics.

IBN's innovative research is aimed at creating new knowledge and intellectual properties in the emerging fields of bioengineering and nanotechnology to attract top-notch researchers and business partners to Singapore. Since 2003, IBN researchers have produced a total of 445 papers published/in press, of which 184 were published in journals with impact factor greater than 3. IBN also plays an active role in technology transfer and spinning off companies, linking the research institute and industrial partners to other global institutions. As of October 2008, IBN has filed 637 patent applications on its inventions and the Institute is currently looking for partners for collaboration and commercialization of its portfolio of technologies.

IBN's current staff strength stands at around 170 scientists, engineers and doctors. With its multinational and multidisciplinary research staff, the institute is geared towards generating new biomaterials, devices, systems, equipment and processes to boost Singapore's economy in the fast-growing biomedical sector.

IBN is also committed to nurturing young minds, and the institute acts as a training ground for PhD students and undergraduates. In October 2003, IBN initiated a Youth Research Program to open its doors to university students, as well as students and teachers from various secondary schools and junior colleges. It has since reached out to more than 23,000 students and teachers from over 190 local and overseas schools and institutions.

In 2008, IBN celebrates 5 years of innovative research. For more information, please log on to www.ibn.a-star.edu.sg.

About AIChE
AIChE is the world's leading organization for chemical engineering professionals, with more than 40,000 members from 93 countries.

AIChE's Vision is to Provide Value as:
The **Global Leader** of the chemical Engineering profession, the **Lifetime Center** for professional & personal growth, and security of chemical engineers, the **Foremost Catalyst** in applying chemical engineering expertise in meeting societal needs.

AIChE Mission:

- promote excellence in chemical engineering education and global practice
- advance the development and exchange of relevant knowledge
- uphold and advance the profession's standards, ethics and diversity
- enhance the lifelong career development and financial security of chemical engineers through products, services, networking, and advocacy
- stimulate collaborative efforts among industry, universities, government, and professional societies
- encourage other engineering and scientific professionals to participate in AIChE activities;
- advocate public policy that embraces sound technical and economic information and that represents the interest of chemical engineers
- facilitate public understanding of technical issues; and
- achieve excellence in operations of the Institute.

For more details on AIChE's Centennial, visit AIChE.

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