

Department of Chemistry Hosts International Conference on Latest Advances in Boron Neutron Capture Therapy for Cancer

The 6th Taiwan-Japan Neutron Capture Therapy Academic Conference of Elite (TJNCT-ACE) was held on April 19 at the Hsu Shou-Chlien International Conference Center of Tamkang University. The event brought together more than 80 domestic and international scholars from institutions such as Gifu Pharmaceutical University, Kyoto University, Institute of Science Tokyo, Osaka Medical and Pharmaceutical University, Osaka University, Osaka Metropolitan University, Hiroshima University, Taipei Veterans General Hospital, Taichung Veterans General Hospital, National Taiwan University Hospital, National Changhua University of Education, and National Tsing Hua University (NTHU). An additional 20 participants joined online.

Hosted by the Department of Chemistry at Tamkang University, the conference was co-organized by the Office of Research and Development, NTHU College of Nuclear Science, the National Health Research Institutes, and the Taiwan Society of Neutron Capture Therapy. A total of 19 papers were presented, covering a wide range of topics—from fundamental chemistry and biology to physical engineering technologies, and clinical applications—offering a comprehensive exploration of the latest advances in Boron Neutron Capture Therapy (BNCT). The event showcased the latest research achievements from Taiwan and Japan in BNCT. It fostered deeper international collaboration and practical exchange, enhancing Taiwan's visibility in the global landscape of innovative cancer treatments.

The opening ceremony featured speeches by Professor Chih-Hsin Chen, Chair of the Department of Chemistry; Dean Tsung-Kuang Yeh of Tsing Hua's College of Nuclear Science; and Professor Koji Ono from Osaka Medical and Pharmaceutical University, who also delivered the keynote address, sharing insights on future directions in BNCT development. In his remarks, Professor Chen reflected on a visit to observe BNCT at NTHU, where he was deeply moved by the sight of a young patient calmly entering the treatment room, watching cartoons while undergoing therapy. "It was a powerful

experience that showed how BNCT can reduce physical and mental stress for patients," he said. Chen emphasized that BNCT is a highly interdisciplinary treatment, requiring collaboration across chemistry, particle physics, medicine, and biology. He noted that only through cross-disciplinary partnerships and robust academic exchanges can BNCT continue to advance and achieve clinical application.

Conference organizer Professor Po-Shen Pan of the Department of Chemistry highlighted that the event strengthened Taiwan-Japan academic ties and laid a stronger foundation for BNCT's clinical implementation and international cooperation. He explained the BNCT procedure: patients are first administered a boron-10-containing drug that accumulates in cancer cells. When exposed to neutron beams, these cells release high-energy alpha particles and lithium atoms that destroy the cancer cells from within. What's remarkable is the ultra-short range of these particles, meaning they target tumor cells precisely without damaging surrounding healthy tissue. BNCT has already shown promising results against various cancers, including malignant brain tumors, recurrent head and neck cancers, liver cancer, melanoma, lung cancer, and mesothelioma.

Dr. Yi-Wei Chen from Taipei Veterans General Hospital, who also presented a paper, stated that BNCT represents a revolutionary approach to cancer therapy. Japan has already adopted it as an official medical treatment, and Taiwan may soon follow, becoming the second country in the world to offer this method. He stressed that developing new boron-containing drugs is essential for advancing the technology. He acknowledged the longstanding contributions of Professor Pan and Associate Professor Chung-Hung Hsieh of the Department of Chemistry, expressing hope that their work will lead to breakthroughs in the field.

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Focusing on innovative cancer therapies, the Department of Chemistry hosted the 6th Taiwan-Japan Neutron Capture Therapy Academic Conference of Elite, TJNCT-ACE; participating scholars posed for a group photo.



Osaka Metropolitan University BNCT Director Mitsunori Kiriha (from left), Tamkang University Chemistry Professor Po-Shen Pan, Department Chair Chih-Hsin Chen, and Institute of Science Tokyo Professor Hiroyuki Nakamura attended the international conference on Boron Neutron Capture Therapy.



Professor Po-Shen Pan from the Department of Chemistry (second from right) invited physicians Yi-Wei Chen and Tian-Li Lan from Taipei Veterans General Hospital to participate in innovative research on boron neutron capture therapy for cancer treatment.

