



## Research

### Chip Technology to Improve Depression Symptoms

Brain stimulation is seen as a new hope for treating depression. In collaboration with the global medical device company Abbott, a research team led by Professor You-Yin Chen from the university's Department of Biomedical Engineering has made significant findings. Their research demonstrates that using graphene neural probe chip technology to stimulate the nucleus accumbens within the dopamine circuit of the brain not only enhances motivation and reduces depressive behaviors in animal models but also shows strengthened dopamine circuit functional connectivity in brain MRI scans. The study confirms that stimulation of the nucleus accumbens promotes the production of neurotrophic factors in the brain, improving mitochondrial function in neural cells affected by depression. It provides more scientific evidence and technological support for clinical treatment. The results of this study have been published in the international journal *Neurobiology of Stress*.

### Developing AI Medical Devices for Brain Tumors

The university's Medical Device Innovation and Translation Center has developed an AI-assisted brain tumor detection system, 'DeepBT Detector', which has received approval from the Ministry of Health and Welfare. This AI system assists in interpreting MRIs for three major brain cancers: vestibular schwannomas, meningiomas, and brain metastases. It is Taiwan's first AI medical device capable of automatically detecting and annotating multiple types of brain tumors. Additionally, the center has developed a 3D-printed mandibular plate technology that has passed the Quality Management System (QMS) certification from the Taiwan Food and Drug Administration. The university has become the first institution to simultaneously hold QMS certification and licenses for Class I and II medical devices.

## 03 GOOD HEALTH AND WELL-BEING

### Social Impact

#### Guardians of Elderly Health

The university's USR project, "Guarding the Elderly Action Plan," has partnered with San-Zhi Health Center and its attached physical therapy center to create a series of fitness classes tailored to seniors. The courses include exercises using resistance bands, rope ladders, and interactive activities with medicine balls, making exercise more enjoyable and increasing the willingness of seniors to participate. After 11 sessions, clear improvements were observed in the physical abilities of all participants, demonstrating the positive effects of appropriate therapy and exercise on seniors' health. This collaboration between the university and local health units not only enhances the physical and cognitive functions of the elderly but also promotes successful aging in place and community well-being.



#### Oral Health Medical Service Team

To raise awareness of self-oral care and establish oral health concepts in the community, the university's School of Dentistry, in collaboration with the Wenshan Health Center in Taipei, promotes oral health exercises and hygiene education for seniors. In addition to professional lectures, the team conducts numerous oral health education sessions in areas such as Shilin, Beitou, Neihu, and Zhongshan districts in Taipei, as well as in Yilan, Hsinchu, Taichung, Changhua, Kaohsiung, and Pingtung. These sessions target school children, seniors, the general public, and care facility workers, emphasizing the importance of oral health. From 2018 to 2023, 114 educational sessions were held, benefiting nearly 10,000 people. Between 2022 and 2023, approximately 50 sessions were conducted, reaching around 2,500 participants.

#### Community Health Education in Cambodia

The university's "Southeast Asia International Volunteer Team BAT" is committed to improving the health and well-being of local community residents. In 2024, in collaboration with a local support center in Cambodia, the team will conduct "health and hygiene" education classes and interactive workshops in three suburban communities of Phnom Penh supported by the center. The health education activities will focus on three main themes: physical, mental, and women's health. The goal is to equip the Cambodian community with better health knowledge and encourage them to lead healthier lives while fostering resilience. This effort aims to reduce the health disparities between different social classes in Cambodia and help bridge the gap between Cambodia and developed countries.

## Education & Cultivation

### Establishing a Modern Chinese Medicine Program to Train Innovative Practitioners

In 2023, the university established the Department of Chinese Medicine to promote traditional Chinese medical knowledge while integrating modern smart healthcare to cultivate research talent in Chinese medicine. The program aims to heal diseases, enhance public health, and restore vitality and the value of life. To internationalize Chinese medicine education in Taiwan, President Lin Qi-Hong and the Department of Chinese Medicine faculty have actively visited universities in Hong Kong and South Korea. They engaged in deep discussions on medical education, clinical research, and healthcare services, establishing academic bridges across countries. Besides Taiwan and China, Hong Kong and South Korea have a long history of offering Chinese medicine programs in Asia. Notably, Busan University's Korean Medicine School shares a similar founding philosophy with the university's Chinese Medicine Department, making it a key partner in these international collaborations.



### Interdisciplinary Clinical Dental Treatment Course

Oral function is closely related to brain function. Based on years of research in neuroscience and behavior, Professor Lin Chia-Shu of the university's School of Dentistry designed an interdisciplinary course titled "Brain, Behavior, and Dentistry." It is the world's first course to explore the connections between clinical dental treatment, the human brain, and patient behavior. In collaboration with the international online learning platform "FutureLearn," the course is offered to healthcare professionals, patients, and the general public in nearly 100 countries worldwide, helping them better understand the links between dental treatment, brain function, and patient behavior. This course has also won the Excellence Award from the Taiwan Open Course and Education Consortium (TOCEC).

## Stewardship

### Offering Free Psychological Counseling Services

As the pace of life accelerates and work pressures increase, many staff members are facing mental health challenges. To promote the psychological well-being of all university staff, the university's Health Psychology Center offers free one-on-one counseling and consultation services. These services aim to enhance resilience and teach effective methods for managing stress and emotions. From 2023 to June 2024, the center provided counseling to 389 staff members, addressing issues such as family relationships, self-identity, emotional concerns, romantic relationships, interpersonal dynamics, career development, gender identity, and health.

### Mental Health Promotion Activities

The university's Health Psychology Center organizes mental health promotion lectures, workshops, and events each semester. These activities include online, interactive games, physical interactive exhibitions, in-person lectures, and stress-relief workshops. From 2023 to June 2024, 32 events were held, allowing staff to learn about mental health knowledge and skills through participation, helping to prevent and reduce mental health issues and minimizing their impact on work efficiency. Additionally, to strengthen the psychological resilience of faculty, staff, and students, the center launched a campaign in 2023 featuring the playful image of a "sloth," symbolizing a slower-paced lifestyle. The campaign encourages the university community to find their own rhythm to handle a busy schedule.