





03

GOOD HEALTH AND WELL-BEING

	2018-2022 Publications	6,005
	Course Units	38,497
	Student Engagements with Units on SDG 3	1,283
	2018-2022 Percentage of all Taiwan Publications	16%

Research

A New Generation of Blood Sugar Management Tools for Diabetes

With aging populations, diabetes has become the biggest social burden from chronic illnesses in development nations. Not only are patients using lancets to monitor blood sugar levels at home at risk of infection, the lancets become medical waste after a single use. Therefore, scientists are always striving to develop more convenient and real-time blood glucose detection methods. The research team led by Professor Cheng-Yang Liu of NYCU' s Department of Biomedical Engineering has successfully developed a fiber optic glucose sensor using the silk of Giant woods spiders that can effectively measure the concentrate on of fructose, sucrose, and glucose within one ten thousandth of a second. The scope of measurement covers all the possible concentration of sugar in human blood, making the sensor viable as the next generation' s blood sugar detection tool. The research findings are published in the September 2022 issue of *Biomedical Optics Express* and selected as an Editor's Choice for the publication.

Nanotechnology in Precision Cancer Treatment

The research team of Associate Professor Wei-Ching Liao of NYCU's Institute of Biochemistry and Molecular Biology is focused on the development of DNA-related nanotechnology. The team has successfully used DNA to produce hydrogel capsules, which can encapsulate drugs or signal sources and react with specific cells in the body at the molecular level. The DNA capsules can be used not only for in vitro biomarker detection, but also for loading therapeutic drugs, and can be developed as a controlled release drug delivery system in vivo. This technology will help shorten detection times and reach the limit of practical application to achieve precise medical treatments by first sensing and then treating. The research results have been published in *Nanoscale*.

Social Impact

Smart Fitness Clubs for Seniors

Promoting the health and well-being of senior people, NYCU launched the "Smart Fitness Clubs for Seniors" project. This project established community-based fitness clubs for senior citizens, introducing smart mobility architecture (SMARC) and fitness equipment suitable for aging muscles to strengthen the upper and lower limbs, core muscles, and cardiopulmonary functions of senior people, in order to delay aging and prevent disability. The clubs were also the first to have fitness equipment that feature high precision and AI evaluation functions, which can provide personalized evaluations and training prescriptions through an online platform. The clubs were established in collaboration with the TSMC Charity Foundation, which contributed to venue construction and volunteer training. Also, with the support of the Hsinchu City Public Health Bureau, the team established a "senior health promotion station" in the city's Lushui Village. The station provides practical health information and a place to exercise. These are all part of NYCU's efforts to fulfill its social responsibilities and strengthen community resilience.

Introducing Correct Health Education to the General Public

To clarify false health information and establish correct medical knowledge among the public, the Department of Pediatrics of NYCU's College of Medicine has created the digital course "Growing Up Healthy: A Brief Introduction of Common Pediatric Diseases" based on common pediatric diseases. The course covers common pediatric diseases like pediatric dermatological issues, ADHD, enterovirus, and asthma, and is free for the public to access through the "ewant" platform. Making the course widely available to the public will hopefully ensure that parents, expecting parents, kindergarten and elementary school teachers that interact with children on a regular basis, and everyone interested in health education are equipped with correct medical information.



Education & Cultivation

National Health System Program

The International Health Program of NYCU's College of Medicine, in collaboration with the International Cooperation and Development Fund (ICDF), organized the "2022 Advanced Training Program on Strengthening Health Systems." The program was attended by 11 mid- to high-level officials from Taiwan's ally countries, namely Belize, Guatemala, Paraguay, Saint Lucia, Saint Vincent, and Eswatini, representing their respective Ministries of Health and Welfare and medical institutions. National Yang Ming Chiao Tung University Hospital, Yilan County Public Health Bureau, Far Eastern Memorial Hospital, Dun Ren Psychiatric Hospital, and Medigen Vaccine Biologics worked together to establish this public health professional course, providing an opportunity for ally officials to visit Taiwan for training, strengthen international diplomatic ties, exchange public health technologies, and realize the vision of strengthening the global health system.

Sex Education and AIDS Prevention

To protect students' health and well-being and eliminate AIDS and other infectious diseases, NYCU organized many events to properly educate students about sex education, AIDS prevention, and responsible sexual activity, promote sexual health and equality, and prevent the spread of sexually transmitted diseases. These events include NYCU's Dean putting on a pregnancy suit to emphasize the importance of safe sex and help students understand the importance of sexual health and AIDS prevention measures. NYCU also organized a poster design competition with the theme of "Hands-on Drawing, Weaving Happiness," encouraging students to use their creativity to express their understanding of AIDS prevention issues, spreading their messages through art.

Stewardship

Promoting the Concept of "One Health"

"One Health" is a relatively new concept. In recent years, there have been frequent cases of microorganisms, viruses, and bacteria infecting humans and animals at the same time, leading to the spread of zoonotic diseases. COVID-19 is a prime example. To raise awareness of the risks and prevention of zoonotic diseases, NYCU's Research Center for Epidemic Prevention and One Health organized the "First One Health Student Short Video Competition" focusing on the topic of "zoonotic diseases." The team behind the video that won first place, "No Bangkok No Party," chose toxoplasmosis as the video's main topic, providing an in-depth look at the formation and prevention of the *Toxoplasma gondii* parasite that causes toxoplasmosis. This team not only received a cash prize of NT\$10,000, but also represented NYCU in the "2022 Bangkok One Health Student Summit." NYCU hopes that the production of these videos will help students understand that humans, animals, and the environment are one, and that mutual cooperation is the way to effectively prevent and control epidemics.

