

Substantial Development Goals Report (SDG3)



Good health and wellbeing





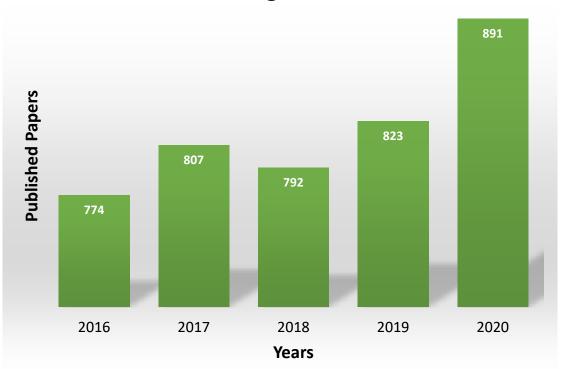
Research & Innovation

- Chang Gung University (CGU)
 published 4087 scholarly papers
 related to SDG3 between 2015-2020
 (based on Scopus database)
- Chang Gung secured 2445 research grants between 2018-2020

Teaching

 There are 813 graduates whose major is closely related to SDG3

Publications relating to SDG 9 from CGU







The University's social responsibility focuses on the core of health care, gives full play to the expertise of teachers and students of the University and fellow schools, and cooperates with the legal person of Chang Gung medical consortium to make a real impact on the society. Aiming at promoting the health of the community people, the university has expected to develop care model that has policy influence. At present, it has cooperated with the following relevant local units:

Partner schools: Chang Gung University of Science and Technology (CGUST), Hsin Sheng Junior College of Medical Care and Management. Fuxing District: Jie Shou elementary school, Taipei Municipal Jieshou Junior High School, The Indigenous Tribal Culture Health Station, Gao Yangwei Family Medical Clinic. Guishan District: Public Health Center of Guishan District, Dahua Village Office, Wenqing Village Office, Dahu Village Office, Jingzhong Village Office and Jiulu Village Office. Others: Linkou Geriatric Psychiatric Day Care Center, The Cerebral Palsy Association of Taoyuan and Taiwan Rett Syndrome Association





Outreach & Partnership

The purpose of improving teachers' teaching knowledge and related students' leadership skills for the elderly in the community is to enhance teachers' relevant knowledge and students skills to assist the elderly in the community, help the elderly delay the degradation and improve their quality of life through effective sports and cognitive courses, and attract the elderly to go out and cooperate in the groups through interesting interactive courses competition and other different participation modes, so as to achieve the purpose of social participation.

https://harc.cgu.edu.tw/p/406-1033-73877,r1959.php?Lang=zh-tw





Outreach & Partnership



• In response to the opening of the integrated long-term care center for the elderly, the implementation of the government's health policy and social responsibility, Kaohsiung Minsheng Hospital cooperated with Chang Gung Hospital to set up a "special care area for severe disorders caused by major child abuse", named "flying elephant home", to provide trauma recovery for severe child abuse cases with a friendly environment for medical care. [https://ctee.com.tw/industrynews/395277.html]



• Chang Gung Hospital system implemented 139 community promotion services, physical education, and health projects in 2019, including community overall care services, viral hepatitis screening service management pilot project, active aging and health promotion project for middle-aged and elderly people in Guishan District, etc. [林口長庚醫院結合產官學社區 共同推動社區健康 (yahoo.com)]



• Chang Gung University/Chang Gung Hospital launched the "Comprehensive Sports Medicine Care Services of Chang Gung Memorial Hospital", which takes sports players as the center to structure the care mode of the medical team, and provides integrated care and medical services such as sponsoring players to apply for protectors, customized physical examination, medical subsidies and overseas competition bonuses in combination with professional doctors, sports protectors, nutritionists, physiotherapists and psychologists. [https://health.ltn.com.tw/article/breakingnews/3272477]



Outreach & Partnership







- Healthy Aging Research Center, Chang Gung University held the 2019 annual international forum on health aging. Four scholars from Washington University in St. Louis (WUSH U) are invited to Taiwan for exchange and in-depth academic discussion on relevant fields and topics. The forum shared the practical views on how to provide community services and introduce intelligent technology into future long-term care for the elderly with diseases or healthy elderly in the community. The staff of our school shared the results of aging research from the local perspective of Taiwan, hoping to provide all participants with more different views on community-based services. [https://harc.cgu.edu.tw/p/406-1033-73878,r1959.php?Lang=zh-tw]
- Chang Gung University has developed a VR software "countryside coach" that operates in a simulated situation close to their own life experience, increasing the motivation, fun and sustainability, so as to train the elderly minds, achieve the best effect of making their brains flexible, and reduce or delay the occurrence of dementia. [https://money.udn.com/money/story/5723/5099788]
- Organize training workshops for central program instructors. In order to improve the understanding and practical operation mode of functional therapy related personnel on physical and cognitive function groups, the health aging research center of Chang Gung University organized this workshop. The objectives of the workshop: to refine the curriculum content of physical and cognitive function promotion groups on the basis of demonstration, and to construct the prototype of multiple sets of activity design schemes of physical and cognitive function promotion groups through the team cooperation of the workshop, so as to apply it in leading physical and cognitive function promotion groups. [https://harc.cgu.edu.tw/p/406-1033-77449,r1959.php?Lang=zh-tw]



Geographical Map Displaying MDS Centers (n=24)



University of Bern, Switzerland Nicolas Bonadies , MD

aiwan

Chang Gung Memorial Hospital -Linkou Chang Gung University, Taiwan Lee-Yung Shih , MD

National Talwan University Hospital Division of Hematology, Department of Internal Medicine, Talwan Hwel-Fang Tien, MD, PhD

Thailand

King Chulalongkorn Memorial Hospital, Thailand



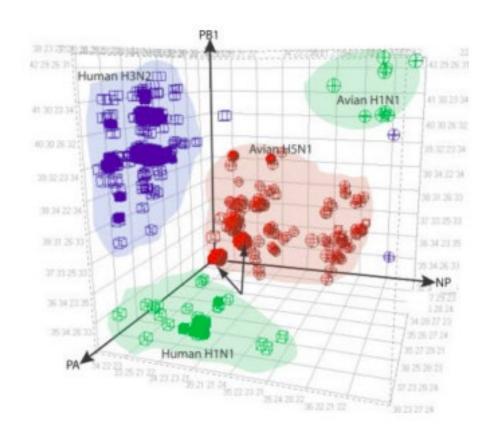
CGU Highlights related to SDG3

Chang Gung University/Linkou Chang Gung Hospital has been certified as an excellent research institution and treatment center of MDS by the MDS foundation since 2014. The International working group for the prognosis of MDS (IWG-PM) is a cooperative organization composed of researchers in this field from 24 countries invited by the MDS foundation. Its main duty now is to evaluate the impact of gene variation on the prognosis of the disease, hoping to find potential therapeutic target genes as the basis for the development of novel drugs in the future. Professor Shih, Li-Yun participated in this international cooperative research team. In addition to jointly publishing papers, the team has established a comprehensive molecular risk clustering algorithm for this disease based on clinical parameters and a variety of gene variants, so as to early identify patients in high-risk groups and give special interventional treatment.

https://www.mds-foundation.org/mds-centers-of-excellence-map-new



As the human influenza virus is increasingly affecting the world, in order to develop a more matching influenza vaccine, Professor Kuan-Fu Chen of Chang Gung University/Chang Gung Hospital and Johns Hopkins CEIRS are developing an improved method to quickly identify influenza strains in the influenza season. To this end, human influenza virus strains in the United States and Taiwan are being collected and tracked as part of an effort to establish a real-time influenza case database from hospitals and other medical institutions. Such monitoring and tracking in the central database can help develop influenza vaccines that better match the seasonal virus strains prevalent. In addition, researchers from the two countries are analyzing the impact of influenza virus infection on human respiratory epithelial cells in order to better understand how to control and treat influenza infection.

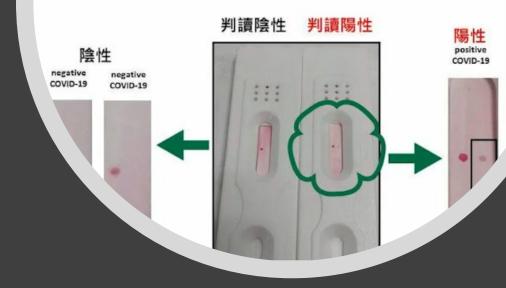


NIAID CEIRS - Centers - Johns Hopkins / Center Highlight: Introducing the Johns Hopkins CEIRS Center - NIAID CEIRS / Influenza Research Database - Supported Programs (fludb.org)



- The team of Chang Gung hospital, Chang Gung University and the University of California, USA jointly developed a new technology to interpret toxicity with experimental chips, which is faster and lower cost. It is like "Rapid Toxicology Screening", offering more possibilities in the future. [https://udn.com/news/story/7266/5716634]
- Twenty-two Covid-19 virus strains were successfully isolated by the cooperative research team consist of the Chang Gung University, Chang Gung hospital, Academia Sinica, the Institute of Preventive Medicine, Ministry of National Defense and University of Oxford, and the complete genome sequence of the virus was obtained. Covid-19 strains from different countries around the world could be used as a test reagent or antiviral treatment material, bringing new opportunities in the future. At present, the research team has established a method to accurately detect the titer of the virus to evaluate the test and treatment effect. [https://tinyurl.com/y3etxff8]

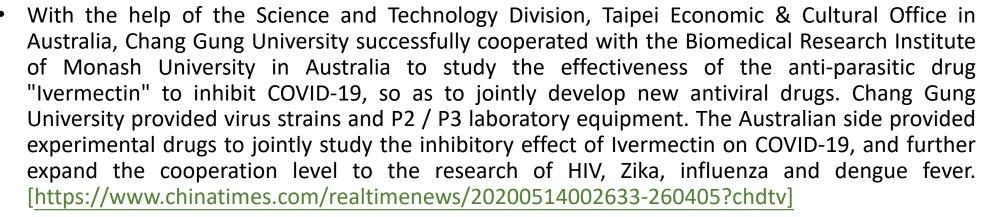
長庚團隊 突破性COVID-19快篩試劑判讀結果











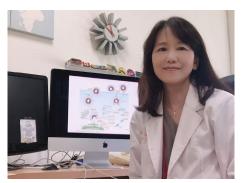


• GASE of the Ministry of Science and Technology held a series of Formosa GX lectures "Taiwan-Japan Matchmaking Conference on Aging Research Cooperation". Chang Gung University exchanged with the University of Tokyo, Tokyo Institute of Technology, Institute of Physical and Chemical Research and National Institute for Materials Science, discussed and shared achievements with each other, and looked forward to continuous innovation and breakthrough, so as to promote the development and medical cooperation between the two sides. [https://cgunews.cgu.edu.tw/p/406-1049-79517,r964.php?Lang=zh-tw]



• Chang Gung University and Far East Bio-Tec Co., Ltd. discovered that FB-1603, the main ingredient of Apomivir in the human influenza clinical trials, could significantly inhibit the activity of COVID-19. The new drug is expected to be successfully developed and is expected to reach more than 90 billion yuan at the beginning of the year. [https://www.chinatimes.com/newspapers/20201202000374-260210?chdtv]









- Chang Gung University and the National Institutes of Health of the United States jointly conducted a research project on the immune response of people after different vaccines. The follow-up complete results will be provided as a reference. [長庚、美國國家衛生院合作研究疫苗接種免疫反應 (yahoo.com)]
- Chang Gung University, MJ Group and AUO Digitech Taiwan Inc. jointly developed a new generation intelligent health examination process system, which used machine learning training algorithm to find the mode and relevance of large data sets, and made the best decision and prediction according to the analysis. This principle is applied to the original health examination system of MJ Group and upgraded to an intelligent health examination system with the function of network platform app "MJ's Automated Multiphasic Health Testing and Service (AMHTS)", and will be promoted as a leading pioneer of global health management services in the future. [美兆健檢再升級與長庚大學、友達數位合作全面AI優化 (yahoo.com)]
- Chang Gung University was selected into the R & D program subsidy list of the Research Center for Epidemic Prevention Science of the Ministry of Science and Technology, built a high protection laboratory platform and medical center field, built the latest biosafety level III Microbial Laboratory, invested in epidemic prevention research and human health welfare, and promoted in combination with the work related to the national epidemic prevention program. Assisted the government in implementing the "precision health and precision epidemic prevention". [https://www.1111.com.tw/news/jobns/140930]









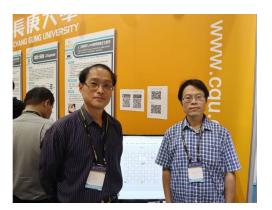


- Chang Gung University and Formosa Plastics Group cooperated to develop "Dr's Formula antivirus spray", which can effectively inhibit COVID-19 and commercialize it to promote medical and epidemic prevention. [https://finance.ettoday.net/news/2013149]
- Chang Gung established a "microflora treatment center" and signed a memorandum of cooperation with the Food Industry Research and Development Institute(FIRDI), to jointly develop a synthetic "precision microflora treatment" method and promote more translation research with new technology to explore the mechanism of microflora and ensure safety. [https://health.ettoday.net/news/1629268]
- Chang Gung University implemented the plan of the Ministry of Science and Technology, the "Multidisciplinary Consortium in Creative Idea of Medical Care", and worked with Taiwan Flex Electronics Inc. and the Plastics Industry Development Center (PIDC) to develop the "Sampling and inspection isolation protection hood". This newly invented hood can prevent the virus from polluting the environment as much as possible, while taking into account the protection of medical staff and reducing the sense of oppression of the examinee, so as to guard the new life under epidemic prevention. [https://cgunews.cgu.edu.tw/p/406-1049-74896,r964.php?Lang=zhtw]
- Chang Gung Hospital and National Yang-Ming University jointly found that a new pathogenic gene of Lissencephaly disease was a spontaneous mutation of patients, which had only 13 patients around the world. [https://health.ltn.com.tw/article/breakingnews/3299360]





The international intelligent biomedical alliance of Chang Gung University participated in the "BIO Asia—Taiwan 2020", which covered topics related to detection, early diagnosis and prediction of diseases, clinical application and treatment, health promotion and rehabilitation, antimicrobial and so on. Under the witness of the Ministry of Science and Technology, it signed a cooperation plan with Ezconn Corporation to jointly develop a portable multifunctional 3D skin and ophthalmic optical detector, and jointly developed a technology for skin texture detection and skin disease diagnosis. This technology has also won the "Industrial Value Creation Program for Academia" of the Ministry of Science and Technology, which will realize high-level diagnostic medical materials for skin cancer in the future. [2020亞洲生技大展 長庚大學16組研發成果吸睛|台灣好新聞 TaiwanHot]



Taiwan's population structure has turned to the trend of aging. In this situation, the accurate use of long-term care resources has become a necessary act for the government and medical institutions. Recently, Chang Gung University and SMIMS Technology Corporation have jointly developed an ultra wideband accurate wireless positioning system, which not only greatly shortens the system construction time and improves the accuracy, but also extends the intelligent function of the positioning technology by combining with AI technology to judges the posture of the elderly, and sends it back to the back end for analysis. When the returned information shows that the elderly lies horizontally and the caregiver's position is not somewhere near the hospital bed, the system will determine that the old person is very likely falling down, and immediately notify the caregivers to check and deal with it.

[https://tinyurl.com/z8f3j776]









- With the support of the Ministry of Science and Technology, the team of Chang Gung University and Fu Jen Catholic University successfully found the causal relationship between intestinal health and lung health, established the world's first concept of "Gut-lung axis", and then found probiotic strains that are expected to treat Chronic Obstruction Pulmonary Disease (COPD), which can be further made into health food or drugs in the future. [https://health.ltn.com.tw/article/breakingnews/3499461]
- Chang Gung Hospital has developed the training technology of "Robot-aided rehabilitation" and established a "Robotic Rehabilitation Center" to serve patients as an important place for the service, research and development of rehabilitation robots in Taiwan. [https://ctee.com.tw/industrynews/biomed/373787.html]
- Chang Gung University and National Defense Medical Center formed an anti- COVID-19 drug
 R&D team to verify that perilla can resist COVID-19, which is comparable to Remdesivir. The
 team will develop a product that can enhance the anti-COVID-19 activity by 30 times, and
 build a high risk pathogen research integration platform.
- [https://udn.com/news/story/7266/5310296]



• The Ministry of Science and Technology has introduced SmartLabs, a biomedical accelerator. Hawk Scientific Co., Ltd, established by the technology transfer of Chang Gung University, has developed a detection kit for pathogenic nucleic acids and proteins, as well as a hand-held fast-screening instrument combined with test paper detection. Both methods can be applied to the detection of COVID-19 virus. At present, the fast screening instrument can complete 300 nucleic acid tests per machine in one hour. It is expected to be used in rural areas and places without medical testing laboratories. [https://finance.ettoday.net/news/1701041]

 Rotary International participated in the IDS program of Ministry of Health and Welfare, cooperated with the Chang Gung team, and the Chang Gung Medical Technology Co., Ltd. integrates the hospital equipment to build an ophthalmic tour vehicle, which can go deep into the mountain tribes communities. Combined with 5G communication and AI image processing, 4K high-resolution images can be transmitted to the Department of Ophthalmology, Linkou Chang Gung Memorial Hospital for interpretation, so as to assist the tour doctors in judgment and reduce errors. [https://health.ettoday.net/news/1749351]







Using object recognition technology, Chang Gung University has developed an innovative instant mask wearing detection system, which can instantly detect whether people wear masks and whether the wearing method is correct; at the same time, it also further breaks through the image technology to judge whether pedestrians comply with the social distance regulations. In addition to being applied to the campus to remind teachers and students participating in activities or gatherings to pay attention to epidemic prevention at any time, it can also be combined with the general intersection monitor images, which contributes a lot to epidemic prevention monitoring.

[https://www.ftvnews.com.tw/news/detail/2021311L08M1]

• With the support of the Ministry of Science and Technology's "Program Project for Regenerative Medicine" and the "New type industry-university research chain project - Industrial Value Creation Program", Chang Gung Hospital and Chang Gung University have built the world's first missile cancer specific target peptide technology platform. By using the characteristics of the combination of peptides and cancer cells, cancer cells can be accurately targeted as long as they are matched with appropriate anti-cancer drugs. The research team is currently developing innovative cancer immunotherapy for a variety of clinical cancers. It also established a start-up company last year, which will focus on one or two cancers at the beginning, and then expand its range to a high share of various cancer markets. [https://health.udn.com/health/story/6016/4510788]



一般細菌超級細菌

什麼藥都有效



什麼藥都沒效



- Chang Gung Hospital and Chang Gung University have developed a "superbacteria prediction model" using AI Artificial Intelligence, which can identify microbial characteristics more quickly and correctly, complete the prediction in a few seconds, and achieve 80% medication accuracy, making itself a powerful tool against microbial infection. [https://tinyurl.com/7ecvwu9t]
- The traditional Chinese medicine team of Chang Gung Hospital found that the "polyphenol hydroxythealphenone" structural substance (theaflavin) in Taiwan's local tea can combine with Covid-19 coronavirus to prevent virus proliferation. [https://www.cna.com.tw/news/ahel/202003250178.aspx]
- Chang Gung Hospital and Taiwan Miner's General Hospital jointly used intracerebral hemorrhage interpretation AI to build an emergency referral network, shortening the referral time and further reducing the probability of disability or death of patients with cerebral hemorrhage. [https://www.ithome.com.tw/news/137064]
- The Chang Gung team found the whole humanized monoclonal antibody to neutralize strains of different sources, and the effect can reach 90% to 98%. Chang Gung also openly sought technical transformation from manufacturers world wide, hoping to develop anti-Covid-19 drugs as soon as possible. [https://health.udn.com/health/story/120951/4596000]







- Chang Gung medical team developed proton therapy combined with immunotherapy for
 the treatment of advanced liver cancer. Immunotherapy combined with proton radiation
 with accurate control of energy depth has a good therapeutic effect on patients with
 advanced or large tumors and slightly poor liver function. Due to the precision of proton,
 the local control rate of liver cancer was 94% within two years after treatment.
 [https://health.udn.com/health/story/6026/4677326]
- The achievement of "Application of seismocardiogram measurement technology and inertial motion sensing in medical care" developed by Chang Gung University completed the human clinical trial verification in Chang Gung hospital, and the technology was transferred to VierMTech Inc. In the future, this non-invasive technology will be combined with wearable technology, machine learning and AloT for commercialization to achieve the objectives of real-time detection, risk assessment and early warning of heart failure. [https://cgunews.cgu.edu.tw/p/406-1049-76444,r964.php?Lang=zh-tw]
- Chang Gung University and Chang Gung Hospital jointly developed the "Application of pressure sensor", and officially transferred the technology to Plastics Industry Development Center (PIDC) to further develop "A Pressure Detecting Monitor System For An In Vivo Operation". Making use of the characteristics and clinical application of pressure monitoring system, possible injury during operation can be avoided. [https://cgunews.cgu.edu.tw/p/406-1049-77268,r964.php?Lang=zh-tw]



Hemophilia is a rare disease caused by congenital lack of coagulation factors, resulting in frequent bleeding. In addition to learning to inject themselves, some patients have to go to the hospital twice or three times a week to receive coagulation factor injections; In view of this, Chang Gung Hospital introduced longacting coagulation factors for preventive injection, which greatly reduced the energy of patients running back and forth between their homes and the hospital; Besides, the Chang Gung University / Chang Gung Hospital team also developed an APP to allow patients to log in the injection time and bleeding status, and the annual bleeding rate was reduced from 2.6 times to 1 time.

[https://tinyurl.com/jwhx654y]

Chang Gung University / Chang Gung Hospital has developed a chip in the size of a rice grain to provide appropriate electrical stimulation according to the patient's brain signals. Compared with the current treatment method of deep brain stimulation surgery, it is not only more efficient with less side effects, but also more energy-saving. The team will apply for human clinical trial and it is expected to be officially used for treatment within 5 years at the earliest. [https://health.ltn.com.tw/article/breakingnews/3272291]







Brief Definitive Report | September 03 2020

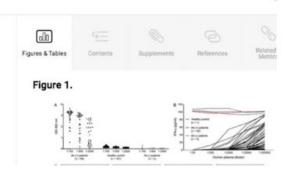
Anti-IFN-y autoantibodies underlie disseminated Talaromyces marneffei infections

Jing Guo, (Sin-Qiang Ning, Jing-Ya Ding, Yan-Qing Zheng, Na-Na Shi, Feng-Yao Wu, Yan-Qing Zheng, Sing, Sin lan Yi-Feng Chang, 🧑 Chun-Fu Yeh, 💿 Kun-Hua Tu, 🔞 Yu-Huan Tsai, 🧯 Cheng-Lung Ku . O Cun-Wei Cao . O

+ Author and Article Information

J Exp Med (2020) 217 (12): e20190502

https://doi.org/10.1084/jem.20190502 Article history @





CGU Highlights related to SDG3

Clinically, human infection with Penicillium marneffei (PM) was ignored in the past, and it is commonly considered to be caused by immune deficiency after HIV (HIV) infection. However, some people without HIV infection also have such infection. Chang Gung University research team found that infection of patients with PM was also caused by a new type of immune deficiency. If it is misdiagnosed as other allergic skin diseases, steroid treatment may increase the risk of death.

[https://tinyurl.com/nx8zpahy]

Chang Gung University successfully developed the "COVID-19 Surrogate" Virus Neutralization Test Kit", which can guickly know whether the body has antiviral neutralizing antibodies in 2 or 3 hours as long as the neutralization antibody is combined with a specific protein. It can not only improve the safety of overall detection, but also accelerate the development of Covid-19 vaccine. Technology transfer cooperation has been carried out for this kit technology so far and it is hoped to help countries develop vaccines and antibody drugs through professional marketing of domestic test reagent manufacturers. This kit is also used in countries that have opened their borders. In the future, it can also be used as a "Immunity Passport" test method to improve the energy and speed of detecting neutralizing antibodies in the body and help check human health in global economic exchanges.

[https://www.cna.com.tw/postwrite/detail/279194]



- As many as 200,000 to 300,000 people in Taiwan use Baktar, a commonly used drug for the treatment of various human infections, but this kind of antibiotics may cause serious drug allergic reactions and even death to some people. The team of Chang Gung Hospital found out the allergy gene of Baktar, which can be applied to pre-medication gene screening. It has also applied for a global patent, making a big step forward in the progress of precision medicine. [https://tinyurl.com/4sknsc2x]
- Chang Gung University / Chang Gung Hospital has developed fundus Alaided diagnosis software, which can predict eye diseases and see the possible disease trend of the whole body from the fundus image. [https://tinyurl.com/366yuy55]
- The digital capsule developed by Chang Gung Hospital using IoT communication system can be used to detect the changes of intraperitoneal pressure of severe patients, so that doctors can make correct surgical decisions immediately and the treatment of patients with high-risk complications with abdominal compartment syndrome (ACS) can be more timely. [https://www.ithome.com.tw/news/140942]
- The research team of CGU/CGHU collected the data of nearly 80,000 patients with liver disease C in the past 10 years and made efforts in comparison. The results showed that patients who received interferon clearance treatment as soon as possible reduced the incidence of Parkinson's disease by nearly 40% compared with those who did not receive treatment. This result is a big step forward from the feasibility of preventing Parkinson's disease.

[https://www.cgmh.org.tw/tw/News/PressNews/200610001]







We educate, research, and innovate for global and social impacts



