2005 Presidential Science Prize

Life Sciences

Academician Chien-Jen Chen

Dr. Chien-Jen Chen graduated from the National Taiwan University with a B.Sc. in zoology and a M.S. in public health. After obtaining a Sc.D. in epidemiology from the Johns Hopkins University in 1982, he returned to National Taiwan University College of Medicine as an instructor and then a professor in 1986. Dr. Chen has been appointed as the Director of Graduate Institute of Public Health (1993-1994), Director of Graduate Institute of Epidemiology (1994-1997), and Dean of College of Public Health (1999-2002) in the National Taiwan University. In addition to his outstanding research contributions and numerous awards and honors to be mentioned below, he also received an Outstanding Teaching Award (1992) from the Ministry of Education.

Dr. Chen has also served in several government positions including the Director General of Division of Life Sciences, National Science Council (1997-1999), Deputy Minister of National Science Council (2002-2003), Minister of Department of Health (2003-2005), and Minister of National Science Council (2006-2008). After his successful leadership to control the outbreak of severe acute respiratory syndrome in 2003, he has made fundamental reforms of the organization of Department of Health and Center for Disease Control, the Medical Care System for Infectious Diseases and the Act of Infectious Disease Control in Taiwan. In addition to his significant leadership to promote science and technology in Taiwan, he has successfully made the reform of National Science Council and the acceleration of international collaboration. He has won widespread praise as a successful academic administrator and government leader. He received the Health Medal from Department of Health (2005) and the Achievement Medal (2005) from Executive Yuan in Taiwan, as well as the Officier dans l'Ordre des Palmes Academiques (2009) from the Ministry of Education in France.

Dr. Chen has dedicated himself to epidemiological research for three decades. His research accomplishments in epidemiology and preventive medicine are unparalleled in Taiwan. He has published 494 original, review and editorial articles in refereed journals. His publications have been cited for more than 13,000 times in the SCI (Science Citation Index) journals. He has received many accolades and awards for his research achievements, including top awards from the National Science Council, Ministry of Education and many academic foundations. He was elected as an academician of the Academia Sinica in 1998. He received the Presidential Science Prize (2005). His outstanding research achievements are widely recognized internationally. He was elected as a fellow of American College of Epidemiology (1993), a member of the Academy of Sciences for the Developing World (2005), and an honorary member of Mongolian Academy of Science (2007). He was elected as the Dr. DV Datta Memorial Orator by the Indian National Association for Study of the Liver (2008), and the Cutter Lecturer on Preventive Medicine by Harvard University (2008). He received the Science Achievement Award from Taiwanese-American Foundation in the USA (2009).

Dr. Chen has made important contributions in environmental epidemiological research on health hazards of chronic arsenic poisoning. He has provided valuable information regarding the dose-response relationship between long-term arsenic exposure and various diseases including cancers, vascular diseases, hypertension, diabetes, neuropathy, mental retardation, cataract and erectile dysfunction. He was invited by the World Health Organization (WHO), USA Environmental Protection Agency, and International Agency for Research on Cancer (IARC) as an advisor for the assessment and regulation of health hazards induced by arsenic in drinking water. His study findings have been used to establish the maximal contamination level of arsenic in drinking water. WHO and many countries are now adopting this level as the standard for safe drinking water. The impact of his arsenic research is far reaching and has saved millions of lives worldwide. His studies on chronic arsenic poisoning are now considered to be classics in the environmental epidemiology.

Dr. Chen has also made major contributions in molecular and genomic epidemiological study of genetic and environmental risk factors for common human cancers, including hepatocellular carcinoma, nasopharyngeal carcinoma, cervical neoplasia and female lung adenocarcinoma. He collaborated with Prof. Mei-Hwei Chang and Taiwan Hepatoma Study Group to first document that cancer (hepatocellular carcinoma) can be prevented by vaccination (against hepatitis B virus). This important finding leads the new era of vaccination against cervical cancer. His recent discovery on the active replication of hepatitis B virus as a risk predictor of hepatocellular carcinoma has also led to a new clinical guideline for the management of chronic hepatitis B, which affects millions of people worldwide. He was invited by WHO, USA Nation Institutes of Heath and IARC as a working group member to evaluate the cancer risk associated with various viral infections.

Dr. Chen’s accomplishments and reputation have enhanced research standards in Taiwan. His contribution has made Taiwan a leader in the quest to eradicate chronic arsenic poisoning and hepatitis B virus-related liver diseases.

Publications

1. Chen CJ, Chuang YC, Lin TM, Wu HY. 1985. Malignant neoplasms among residents of a blackfoot disease-endemic area in Taiwan: High-arsenic artesian well water and cancers. Cancer Res 45:5895-5899.
2. Chen CJ, Chuang YC, You SL, Lin TM, Wu HY. 1986. A retrospective study on malignant neoplasms of bladder, lung and liver in blackfoot disease endemic area in Taiwan. Brit J Cancer 53:399-405.
3. Chen CJ, Kuo TL, Wu MM. 1988. Arsenic and cancers. Lancet 1: 414-415.
4. Chen CJ, Wu MM, Lee SS, Wang JD, Cheng SH, Wu HY. 1988 Atherogenicity and carcinogenicity of high-arsenic artesian well water: Multiple risk factors and related malignant neoplasms of blackfoot disease. Arteriosclerosis 8:452-460.
5. Wu MM, Kuo TL, Hwang YH, Chen CJ. 1989. Dose-response relation between arsenic concentration in well water and mortality from cancers and vascular diseases. Am J Epidemiol 130:1123-1132.
6. Chen CJ, Wang CJ. 1990. Ecological correlation between arsenic level in well water and age-adjusted mortality from malignant neoplasms. Cancer Res 50:5470-5474.
7. Chen CJ, Chen CW, Wu MM, Kuo TL. 1992. Cancer potential in liver, lung, bladder and kidney due to ingested inorganic arsenic in drinking water. Brit J Cancer 66:888-892.
8. Chiou HY, Hsueh YM, Liaw KF, Horng SF, Chiang MH, Pu YS, Lin JSN, Huang CH, Chen CJ. 1995. Incidence of internal cancers and ingested inorganic arsenic: A seven-year follow-up study in Taiwan. Cancer Res 55: 1296-1300.
9. Chen CJ, Hsueh YM, Lai MS, Hsu MP, Wu MM, Tai TY. 1995. Increased prevalence of hypertension and long-term arsenic exposure. Hypertension 25:53-60.
10. Chen CJ, Chiou HY, Chiang MH. 1996. Dose-response relationship between is chemic heart disease mortality and long-term arsenic exposure. Arterioscl Throm Vas Biol 16:504-510.
11. Chang MH, Chen CJ, Lai MS, Kong MS, Wu TC, Liang DC, Hsu HM, Shau WY, Chen DS, Taiwan Childhood Hepatoma Study Group. 1997. Universal hepatitis B vaccination in Taiwan and the incidence of

hepatocellular carcinoma in children. New Engl J Med 336:1855-1859.
12. Chen CJ, Yu MW, Liaw YF. 1997. Epidemiological characteristics and risk factors of hepatocellular carcinoma. J Gastroen Hepatol 12:S294-S308.
13. Chien YC, Chen JY, Liu MY, Yang HI, Hsu MM, Chen CJ, Yang CS. 2001. Serological markers of Epstein-Barr virus infection and nasopharyngeal carcinoma in Taiwanese men. N Engl J Med 345: 1877-1882.
14. Yang HI, Lu SN, Liaw YF, You SL, Sun CA, Wang LY, Hsiao K, Chen PJ, Chen DS, Chen CJ. 2002. Hepatitis B e antigen and the risk of hepatocellular carcinoma. N Engl J Med 347:168-174.
15. Wang CH, Jeng JS, Yip PK, Chen CL, Hsueh YM, Chiou HY, Wu MM, Chen CJ. 2002. Biological gradient between long-term arsenic exposure and carotid arteriosclerosis. Circulation 105: 1804-1809.
16. Chen CL, Hsu LI, Chiou HY, Hsueh YM, Chen SY, Wu MM, Chen CJ. 2004. Ingested arsenic, cigarette smoking and lung cancer risk: A follow-up study in arseniasis-endemic areas in Taiwan. JAMA- J Am Med Assoc 292:2984-2990.
17. Chen CJ, Hsu LI, Shih WL, Hsu YH, Tseng MP, Lin YC, Chou WL, Chen CY, Lee CY, Wang LH, Cheng YC, Chen CL, Chen SY, Wang IH, Hsueh YM, Chiou HY, Wu MM. 2005. Biomarkers of exposure, effect and susceptibility of arsenic-induced health hazards in Taiwan. Toxicol Appl Pharmacol 206:198-206.
18. Chen CJ, Yang HI, Su J, Jen CL, You SL, Lu SN, Huang GT, Iloeje UH. 2006. Risk of hepatocellular carcinoma across a biological gradient of serum hepatitis B virus DNA level. JAMA-J Am Med Assoc 295:65-73.
19. Iloeje UH, Yang HI, Su J, Jen CL, You SL, Chen CJ. 2006. Predicting cirrhosis risk based on the level of circulating hepatitis B viral load. Gastroenterology 130:678-686.
20. Yang HI, Yeh SH, Chen PJ, Iloeje UH, Jen CL, Wang LY, Lu SN, You SL, Chen DS, Liaw YF, Chen CJ, REVEAL-HBV Group. 2008. Association between Hepatitis B virus genotype and mutants and the risk of hepatocellular carcinoma. J Natl Cancer Inst 100: 1134-1143.