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Introducing the Incoming NSC Chairman Dr. Che-Ho Wei



Dr. Che-Ho Wei, originally Vice President of the National Chiao Tung University (NCTU) in Taiwan, was chosen as the new chairman of the National Science Council (NSC). After graduating with a B.S from the NCTU department of electronic engineering, Dr. Wei received his doctorate from the department of electrical engineering at University of Washington, Seattle, U.S.A.. His posts have included professor and Director, Science and Technology Advisory Office, at Ministry of Education, Taiwan, ROC and Dean of the Electrical Engineering and Computer Science at NCTU and Vice President at National Chiao Tung University. Being a researcher, Dr. Wei has been dedicated in communication and digital signal processing for many years and has accumulated outstanding achievements in the area. It is believed that Dr. Wei's leadership will help the NSC to smoothly accomplish its affairs and fulfill its mission, while promoting the upgrading of academic research and the high-tech industry environment in Taiwan.

Name	Dr. Che-Ho Wei
Date of Birth	Born in Taiwan, April 28, 1946
Education:	
Ph. D. 1976	Electrical Engineering University of Washington, Seattle, U.S.A.
M. S. 1970	Electronic Engineering, National Chiao Tung University, Taiwan
B. S. 1968	Electronic Engineering, National Chiao Tung University, Taiwan
Professional Positions:	
10/98~3/01	Vice President, National Chiao Tung University (NCTU)
8/95~7/98	Dean, College of Electrical Engineering and Computer Science, NCTU.
8/93~7/95	Dean of Research and Development, NCTU.
8/92~7/94	Director, Center for Telecommunications Research National Chiao Tung University
9/90~7/92	Director, Science and Technology Advisory Office, Ministry of Education, Taiwan, ROC
8/84~7/89	Director, Institute of Electronics National Chiao Tung University
8/82~7/86	Chairman, Department of Electronics Engineering National Chiao Tung University
8/79~7/82	Country Manager of customer Engineering, Wang Industrial Company Taipei, (a subsidiary of Wang Laboratories, Mass, USA) .
8/79-present	Professor, Department of Electronics Engineering, National Chiao Tung University
8/76~7/79	Associate professor Department of Electronics Engineering and Institute of Electronics, National Chiao Tung University
Industrial Experience:	
8/79~7/82	Country manager of customer engineering, Wang Industrial Company, Taipei, (a subsidiary of Wang Laboratories, Mass., USA)

Executive Yuan Honors for 1999 & 2000 Outstanding S&T Personnel

The Executive Yuan has honored outstanding scientists and technologists since 1976. These awards, which include medals and monetary prizes, seek to encourage long-term commitment to research and development work. Following an open selection process, Ms Chu-Fang Lo, Mr. Chwei-



Executive Yuan Premier Chang Chun-hsiung (fifth from left) with the award winners.

Chin Chuang, Mr. Nicky Lu, Mr. Joseph Ting, and Mr. Hong-Rong Lin were chosen as the 1999 & 2000 winners on the basis of their distinguished achievements. The following is a summary of each of the winners' most notable accomplishments:

Prof. Chu-Fang Lo is an international authority on shrimp virology. Her research on the control mechanisms of the white spot syndrome virus (WSSV) of shrimp, a serious threat to the shrimp-farming industry, has made important contributions. Her exceptional results in areas ranging from the genetic characteristics of WSSV to control theory to technical solutions have won tributes from her colleagues in the academic world and are making a positive impact on aquatic

organism virology research and the sustainability of shrimp farming.

Prof. Chwei-Chin Chuang has earned an international reputation in the microreconstruction of peripheral nerve injury. In particular, he is considered to be highly experienced and deeply knowledgeable in the field of brachial plexus injuries. The shoulder reconstruction technique he discovered can double shoulder abduction and triple shoulder external rotation. Chuang's two articles on this subject were both published in *Journal of Plastic and Reconstructive Surgery*, the world's most prestigious periodical in this field. His achievements have made a great contribution to his country, his hospital, and to the treatment of young patients.

Dr. Nicky Lu and Mr. Joseph Ting are internationally-recognized researchers and managers in the field of electronics. They have worked on the development of high-speed DRAM technology, and are responsible for many original findings, products, copyrights, and patents. In particular, they are credited with many world-class research advances in high-speed DRAM research and development, including such high-performance products as "16Mb SGRAM," "256Kx16

EDO DRAM," "4Mb SRAM," and "256 CMOS EPROM." They have transformed Taiwan from a technology importer to a technology exporter, and helped create several billion NT dollars worth of products. They have also inspired the introduction of Taiwan-made high-speed DRAM bearing local brand names, and insured that domestic systems firms have a local supply of these key components.

Dr. Hong-Rong Lin has spent many years researching new steel bar and rod products. Besides developing proprietary technology for the China Steel Corporation, he has also helped downstream firms upgrade their processing technology. By fostering the vertical integration of the domestic steel industry, he has strengthened the country's competitiveness and made a tremendous contribution to progress in ferrous metal technology.

These five individuals' research efforts were crowned with outstanding results. Their results, which they shared with society and their country, have spurred academic progress and industrial development, making them exemplars in the domestic science and technology world.

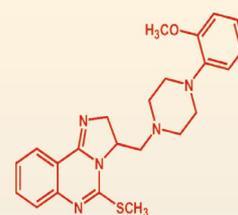
New Anti-Hypertension Drug DL-017 Completes First Stage of Human Trials

An NSC-Sponsored Industry-University Drug Development Project

The number of new drugs that reach the market are an important indicator of a country's level of technological development. This reflects the fact that all of the world's major industrialized countries are investing considerable portions of their manpower and resources in the development of new drugs. In contrast, Taiwan's pharmaceutical industry currently uses imported raw drugs to manufacture various forms of medicines, and lacks its own drug development capability. Facing up to this deficiency, the NSC brought the research laboratory of

Prof. Ji-wang Chern together with the Purzer Pharmaceutical Company to perform joint drug research. This project, which entailed the screening and evaluation of so-called "lead compounds," succeeded in developing the new drug DL-017. A pharmacological safety assessment performed by MDS PanLab Taiwan and a toxicological assessment performed by the Istituto Di Ricerche Biomediche Antoine Marxer in Italy both failed to turn up any toxic side effects, and stage one clinical trials conducted in Britain confirmed DL-017's safety

Chemical Structure of DL-017



A novel α_1 sympathetic nerve blocking agent related to 2,3-dihydroimidazo[1,2-c]quinazoline

and therapeutic benefits. DL-017 is the first drug from Taiwan to have entered the clinical trial stage; by showing that new drugs can be developed locally, it is sure to give the domestic pharmaceutical industry a shot in the arm.

The development of a new drug can be divided into the stages of drug discovery, preclinical trials, clinical trials (I, II, III), and commercial sale, and the drug can be considered to have a different value during each stage. Depending on its need for funds, the developing company may therefore decide to sell rights to the drug or enter into a joint venture. After successfully completing the first stage of clinical trials, Purzer Pharmaceutical is shepherding DL-017 through the second and third stages of trials, and looks forward to bringing the drug to market. As the first example of a new drug developed in Taiwan and making it to clinical trials, DL-017 provides the domestic pharmaceutical industry with a successful model of industry-university cooperation and is having a far-reaching positive impact.

A derivative of 2,3-dihydroimidazo [1,2-c]quinazoline, DL-017 was designed by large NSC research project studying blood pressure reducing drugs. Seeking to link up-, mid-, and downstream tasks and establish a domestic new drug development model, the NSC has encouraged joint research work involving Taiwan's pharmaceutical manufacturers. The NSC thus provided 75% of the funding for the DL-017 project, while Purzer provided the remaining 25%. The research team arrived at the conclusion that DL-017's safety and therapeutic properties were excellent after selecting it from among more than fifty other compounds, performing pharmacological and toxicological tests using animals, and studying the drug's absorption, metabolism, distribution, and excretion. Following the recently-completed first stage of clinical trials, preliminary conclusions indicate that it is free from toxicity when used clinically at therapeutic dosages. Apart from being the first new drug designed and developed in

Taiwan, DL-017 is the first compound to reach the clinical trial stage.

Funded by the NSC, the research project eventually selected the two compounds DL-017 and DL-028 for further research from among more than fifty 2,3-dihydroimidazo[1,2-c]quinazoline derivatives after performing in vitro receptor binding assay and pharmacological activity experiments. While DL-028 had the strongest activity-equivalent to that of Prazocin-DL-017 was found to both reduce blood pressure and block sodium ion channels, making it suitable for hypertension patients associated with arrhythmia incurred by ventricular enlargement. It was also discovered that although SGB-1534 has an antagonistic effect towards H1-receptors, DL-017 lacks this activity and is a relatively weak central nervous system suppression. The researchers therefore selected DL-017 as the target of their development efforts. A pharmacological safety assessment at MDS PanLab Taiwan and a toxicological assessment at the Instituto Di Ricerche Biomediche Antoine Marxer failed to uncover any severe toxicity, paving the way for the first stage of clinical trials in Britain, which also verified the drug's safety. DL-017 is an adrenoceptor antagonist developed through conformational restriction. Because, unlike such other sodium channel blockers as Prazocin and SGB-1534, it is not an H1-receptor antagonist, it represents a significant breakthrough.

Taking SGB-1534 as a lead compound, the project used conformational restriction to modify the compound's molecular structure. By reducing the degree of molecular freedom, it proved possible to strengthen molecular affinity for the receptor and minimize side effects, improving on the prodrug's therapeutic efficacy. This work thus resulted in an all-new drug molecule with commercial potential. Because the methods used and the molecules created had not been previously documented, they have received international patents. Since the project found that DL-017 metabolizes to DL-028 in the body, it can be considered a DL-028 precursor.

Both DL-017 and DL-028 are enantiomers, and further research revealed that (S)-DL-017 is 144 times better at binding to the α 1-AR receptor than (R)-DL-017, and (S)-DL-028 is 200 times better than (R)-DL-028. The all-new molecular structure created by the project's original ideas and synthetic processes is capable of both reducing blood pressure and also serving as a sodium channel blocker. It can therefore relieve the heart arrhythmia that accompanies high blood pressure—a benefit that neither of the existing drugs Prazocin and SGB-1534 can offer. Since the S- conformations of DL-017 and DL-028 are 144~200 times more active than the R- conformations, these drugs will be useful tools in understanding the structure-activity relationship of adrenoceptor antagonists.

The project that developed DL-017 employed an industry-university co-op format and received guidance from the NSC. By successfully taking a drug through the first stage of clinical trials and attracting interest from other pharmaceutical manufacturers, the project has set a precedent for drug R&D and design in Taiwan. Although there is still some distance to go before DL-017 can be sold commercially, the project offers welcome encouragement to Taiwan's emerging biotech pharmaceutical industry, which previously considered new drug development a risky undertaking. In summary, because the unique drug molecule developed using Prof. Chern's specialized techniques possesses greater efficacy and fewer side effects than existing anti-hypertension drugs, it represents a highly significant innovation.

Further Information

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Sino-Japanese Electro-optics Technology Sharing Japanese Electro-optics Graduate Researchers Visit Taiwan



The delegation visits the NSC.



NSC Vice Chairman Wu Mao-kung exchanges presents with the visiting Japanese delegation.

To foster friendly cooperation and technology interchange between researchers in the ROC and Japan, the Japan Interchange Association arranged for a delegation of graduate students in electro-optics from prominent Japanese universities to come to Taiwan in December 2000 for a ten-day visit. Apart from a tour of the NSC, this trip included tours of electro-optics firms, research organizations, National Taiwan University, National Tsinghua University, National Chiao Tung University, and National Cheng Kung University. The chief topics of discussion during the visits included:

1. Generation of photon-number squeezed light by LEDs.

2. Three-dimensional photonic crystal devices and materials.
3. Ultra high density magneto-optical recording materials.
4. Optically-pumped multiple wavelength VCSEL arrays.
5. Frequency-shifted feedback fiber lasers.
6. Optical characteristics of side-polished fiber Bragg gratings.
7. Design of near-field optical heads.
8. Development of optical interconnects for Si-LSIs.

The visiting delegation was led by Dr. Koji Ishida, a professor of Department of Photonics Material Science at Japan's Chitose Institute of Science and Technology. The 23 delegation members consisted of graduate students in Ph.D. and M.S. electro-optics programs at twelve prominent Japanese universities, namely the Tokyo University, Osaka University, Kyoto University, Chikuba University, Hiroshima University, Tohoku University, Japan Women's University, Japan University, University of Communications and Electrical Engineering, Tokyo Institute University, Tokai University, and Tokyo University of Electrical Engineering. The Tokyo headquarters and Taipei office of the Japan Interchange Association assigned personnel to escort the delegation, showing the importance the Japanese attached to the visit.

The roots of the visit go back to July 2000, said Dr. Peter T.C. Shih, executive director of the NSC Electro-

Optics Science & Technology Committee. During that month an international electro-optics seminar and four-nation electro-optics conference were held in Taiwan concurrently with the Taipei International Electro-optics Show. After returning to their country, Japanese representatives who had attended these events proposed bringing around twenty electro-optics graduate students from well-known Japanese universities on a tour of Taiwan towards the end of 2000. The trip was then approved by Taiwan through the liaison and mediation efforts of the NSC Electro-optics Science & Technology Committee. The Japan Interchange Association not only funded the delegation's travel expense, but also paid for a reciprocal visit to Japan by twenty Ph.D. program graduate students from Taiwan.

Taiwan's total output of electro-optics products grew by 31% and surpassed US\$10.7 billion in 2000, said Dr. Peter T.C. Shih, while the industry invested US\$4.32 billion during the same year. With the world's third-largest electro-optics industry, Taiwan plays a key international role in this field. Since past exchange activities sponsored by the Japanese Interchange Association focused exclusively on literature, history, and the social sciences, the selection of electro-optics as the topic of the association's first foray into technology shows the tremendous international significance of this high-tech area.

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