

## In Memoriam: Professor Ray Wu

# The China affection of Ray Wu

Yu-fei Shen

I first knew Professor Ray Wu by name was in the early 1980s when I just came back to the Chinese Academy of Medical Sciences after an eleven year off from Beijing deep in the northwest part of China. Eager to catch up with the advanced knowledge in molecular biology that had been vigorously advanced in the previous decade, I went to the library to look for some reference books in biotechnology. Ray Wu's book entitled *Recombinant DNA*, the 68th volume of the famous series books of the *Methods in Enzymology* attracted my attention immediately and elicited my curiosity on finding out the who's who of Ray Wu with a Chinese Surname. Coincidentally, a couple of months later I happened to have met a guest scientist visiting the library where I was reading; I found out later that it was Professor Ray Wu of the Cornell University whose father was the most renowned Chinese biochemist Professor Hsien Wu (吴宪)!

### Ray Wu's early days in Peking (1928~1948)

Ray Wu was the third child in the family of Hsien and Daisy Yen Wu who was born on August 14, 1928. His father, Professor Hsien Wu was the founder of a newly independent department, the Department of Biochemistry at PUMC in 1922 and then the first Chair of the Department in 1924. Ray's mother, then Daisy Yen (严彩韵), was a teaching associate who joined PUMC in 1923 and became the second faculty of the Department. She assisted Hsien Wu in some important experiments including those supporting the most famous theory of protein denaturation and on detecting nutrition elements in the diet of Chinese. Daisy Yen married to Hsien Wu in 1925 and quit from her job in the department to serve as a volunteer to continue assisting her husband, as it was the rule in PUMC that a married couple were not permitted to work together in the same Department.

After giving birth to her fifth child, Ray's mother started to organize and establish a new private elementary school, the "Ming Ming School" in Peking to provide better education to the students there, both of her own, other children of the PUMC society and others as well. Ray had been well educated since his childhood, which benefited from the efforts of his mother who had laid a solid foundation upon him not only intellectually but also morally.

Then came the days of Japanese invasion and occupation, difficulties in living were inevitably in most of the Chi-

nese families. PUMC, established and funded by the Rockefeller family in the United State of America, was considered an US property in Peking that could continue to run without much disturbance. In 1939, Ray entered "Yu Ying" (育英中学), which was one of the best secondary schools in Peking, and was a member in the basketball team at school. He also loved music and playing the piano. However, at the beginning of 1942 after the Japanese attacked Pearl Harbor, PUMC was also occupied by Japanese army and was ordered by the invader to close. The relatively peaceful life of the PUMC families in Peking was suddenly changed. Most of the faculty members were forced to leave their job; some others had even been put into the concentration camp. Ray's father had left later for Chungking, the war-time Capital of the Chinese government to join in the establishing of a Chinese Research Institute of Health there. Some of the second generation of the PUMC families, Ray's friends and schoolmates felt some uncertainty in their life, their future and their families. As these youngsters had once been got together in a Bible school, they thought of re-organizing a similar Christian fellowship and named it "Salt-Light" in 1942. Ray was among them until he went to college. The summer of the year 1945 was exciting. The Japanese surrendered and Peking was free. The Salt-Light group held a ceremony to celebrate the victory in the city and organized a "long trip" to the Fragrant Hill in the west mountain area of Peking.

Ray Wu entered Fu Jen Catholic University (辅仁大学) in 1945. However, he transferred to Yenching University (燕京大学) as soon as the famous university had moved back to Peking from its temporal campus in Chengdu in the wartime. Ray was admitted to the Department of Chemistry in Yenching University in 1946. Among his activities at school, those with the Yenching Drama Society (燕剧社) were the one that had been well remembered. People hardly ever knew that Ray Wu was a member of the drama group, because he had never been an actor showing up on the stage, but rather, he worked hard at the back stage. In order to make the play poetic and harmonious with the highlighted music, he selected appropriate music pieces to accompany the stage play performances. He played the piano beautifully, and it was Ray but not anyone else in the famous Music Department of Yenching University who was the "pianist" of the group. Sometime Ray just helped controlling the stage light or ringing up the stage curtains, or joined in whatever

jobs needed...The public in and out of the university were enthusing over their plays. Members of the Society clearly remembered that Ray had been participated in writing the "Song of the Yenching Drama Society". They could still sing it even 50 years had passed. In addition, he was also a member of a cross-departments "Jing-de fellowship". The friendship between Ray and his friends at Yenching already lasted 60 years. No matter how short they had been together and how far they were apart, Ray was remembered!

### Ray Wu and the Peking Union Medical College (1980~2007)

32 years later, Ray came back to Beijing in 1980. Although Yenching University no longer existed by name, he visited its old beautiful campus and many friends of the old days. He came back to China very often in the 1980s to initiate and coordinate the government approved program of the China-US Biochemistry Examination and Administration program abbreviated as CUSBEA. In which, some 400 excellent Chinese graduates were benefited through their advanced academic training in biochemistry in the US. In addition to his contributions in CUSBEA, he was well known as one of the pioneers in genetic engineering and more recently in breed improvement of rice, which made him traveled a lot for being invited by many of the top research institutions and universities in China since the 1980s.

Although brought up in a well educated family and respecting his father, Ray had hardly ever talked about his famous father Professor Hsien Wu among his friends. In 1924, Professor Hsien Wu was the first and only Chinese to be qualified for holding a position of Department Chair at the PUMC. He contributed enormously to the progress in biological science in the 1930-1940s at the PUMC and devoted himself life-long in teaching and training biochemists. It was therefore no doubt that Ray was imperceptibly influenced by his father to have first chosen a chemistry major in college and then turned into biochemistry. In fact, Ray had earnestly practiced what his father advocated, which I would like to quote Mrs. Hsien Wu's words in her letter to me in 1993. She wrote that "I am most grateful that Ray has followed his father's footsteps and is carrying on the family tradition".

In 1984, Ray Wu, also on behalf of Mrs. Hsien Wu came back to the PUMC with their intention of establishing a Hsien Wu Professorship in Biochemistry at PUMC to memorize Hsien Wu's contributions in the establishment of the Department of Biochemistry at the PUMC, and his world-wide renowned academic achievements obtained at the Department. He was received by Professors Liu Shilian (刘士廉), then the Dean of PUMC; Liang Chih-Chuan (梁植权), the chair of the Department; Wang Shi-zhong (王世中), one of the deputy chair responsible for Biochemistry teaching, and several others of the Department. Ray's intention was highly evaluated and greatly appreciated by the faculty of the Department of Biochemistry and the Dean of the PUMC. In

1985, a bronze plate carved with the names of Daisy Yen Wu and Ray Wu and their contribution to establish an honored Professorship in Biochemistry of the PUMC was completed and exhibited in the office of Department. Professors Pan Hua-zhen (潘华珍), Shen Yu-fei (沈翊珩), Wang Lin-fang (王琳芳), Qiang Bo-qin (强伯勤) and Liu De-pei (刘德培) have been honored successively with the title of Hsien Wu Professor of Biochemistry at PUMC since 1987.

One of the most interesting findings in Ray's visit at PUMC in 1984 was that he recognized a house in one of the living quarters of the PUMC faculties, where he was born and had spent his childhood there in the late 1920s to the early 1930s. The house happened to be then the residence of his friend of the Yenching days, Mrs. Fu-xuan Zhang (张福萱) and her husband Professor Fang Qi (方圻), an outstanding physician of the PUMC and well known world-wide, both were Yenching graduates. The coincidence had brought an episode to the golden memory of Ray on the PUMC campus and the friendship established in the old Yenching days that lasted until the last days of Ray's life.

In 1987, in commemorating Drs. Otto Follin and Hsien Wu for their work on the quantification of glucose in the blood, Harvard Medical School had set up a Follin-Wu Room as an eternal memory for their contribution. Mrs. Daisy Yen Wu and the Wu's family members were invited to attend the ceremony. Consequently, when the Centennial Anniversary of Professor Hsien Wu in 1993 was approaching, Ray's mother had tried to find an appropriate way to commemorate her late husband in China. She had written to Professor Wu Chieh-ping (吴阶平), then the Vice Chair of the Standing Committee of the National People's Congress, a previous medical student of Professor Hsien Wu at PUMC, and Professor Tsou Cheng-lu (邹承鲁), then the President of the Chinese Society of Biochemistry and Molecular Biology to ask for publishing Hsien Wu memorial postal stamps in China. However, for some reason, the request was considered not appropriate by certain related authorities.

Mrs. Hsien Wu wrote later in her letter of February 1993



Wu family and Fang family at Professor Ray Wu's birthplace residence





On the second page of the FAX, which was a typewritten letter with the official title of Cornell University on top, he wrote "...I would like to assure you that I will try my best to carry out the plans made by my late Mother in relation to the "Hsien Wu library" in PUMC. Consequently, in response to the questions in your May 28 letter to Mother, I wish to provide you with the following information". He answered point by point meticulously after checking all the items listed ...

The ceremony sponsored by PUMC to commemorate the Centennial Anniversary of Professor Hsien Wu was held in late December 1993 to meet Ray's busy schedule<sup>1</sup>. Ray delivered a speech entitled "Hsien Wu (1894-1959)—The Father of Biochemistry in China" at the ceremony. A couple of previous graduates at PUMC who either attended Hsien Wu's lectures in Biochemistry or worked as fellow in Wu's laboratory had been invited. For instance, Professors Wu Chieh-Ping and Zhang Chang-ying (张昌颖) although aged, they still remembered details about him clearly. In addition, Professors Liang Chih-chuan and Wang Shi-zhong, then the Chair and Vice Chair of the Department of Biochemistry along with Pan Hua-zhen and Shen Yu-fei who had been conferred with the Hsien Wu Professorship in Biochemistry each gave a brief talk in memory of Professor Hsien Wu from ones own angle of observation. The President of PUMC Professor Ba De-nian (巴德年), guests and many of the faculties in the Department and from the Institute of Basic Medical Sciences also attended. On the same day, another ceremony followed by that was to confer Professor Ray Wu the honorary Professorship of Peking Union Medical College by the President Ba De-nian.

The third event was the opening of the Hsien Wu Memorial Library at the Department of Biochemistry in PUMC. Ray looked satisfactorily and exciting in the Library newly established that was donated by the Wu's family, which was mostly from the Hsein Wu and Ray Wu Fund and a part from Ray's sister Christine Wu. "I hope that the establishment of the Hsien Wu Memmorial Library this year and the Hsien Wu Professorship in 1985, will contribute to the success of the PUMC, so that it will continue to be the best medical school in China", which was written by Professor Ray Wu on the fly page of the memorial book of the Hsien Wu Memmorial Library on December 29, 1993.

Professor Ray Wu was happy to visit the original "C" building in PUMC where his parents worked together some 70 years ago. He also visited the newly established National Laboratory of Medical Molecular Biology, which was established on the background of the Department of Biochemistry and Molecular Biology at the PUMC and in the neighborhood of it in 1991. He visited laboratories and facilities at the National Lab and stopped over to read some posters carefully in the corridor. He discussed with the authors of each poster one after the other with his comments and suggestion until it was time for dinner.

This was the first formal invited visit of Professor Ray Wu at the PUMC. He spent most of the time with us in the Department of Biochemistry. I found him generous and kind,

with deep affections to and great expectations on the younger generation in the Department of Biochemistry and the PUMC as well.

A couple of years later, we had invited Professor Ray Wu to deliver a lecture in an Annual Meeting of the National Laboratory of Medical Molecular Biology at PUMC. He hesitated a little while and agreed. He had selected a topic to introduce some newly developed techniques in molecular biology in his lecture. He said to me regrettably after the lecture, "if I had not changed my orientation from biomedical science to the work on plant, I probably could contribute more to your Department and the PUMC".



Ray Wu with Hsien Wu Professors Huazhen Pan (front row left), Yu-fei Shen (second row second from left), Linfang Wang (front row right), Boqin Qiang (third row second from left), and Depei Liu (third row far right)

Professor Ray Wu's last official visit to PUMC was in 2004 to attend a special symposium to commemorate his father Professor Hsien Wu's 110th Birthday<sup>2</sup>. Early in 2001, we proposed to Ray about this event and we met him later on a CUSBEA annual meeting on "Frontier Science of the 21st Century" in Peking University to discuss the details arrangement. The commemoration Symposium was held on July 15, 2004. Professor Liu De-pei, the President of Chinese Academy of Medical Sciences and Peking Union Medical College, and the Hsien Wu Professor in Biochemistry then, hosted the commemoration. Ray and his sister Christine were invited to come along with two professors from the United States as suggested by Ray, each of them had presented ones research work and extended their remembrance on Professor Hsien Wu. I had been requested to prepare an introduction on Hsien Wu's days at the PUMC and his great contribution to the scientific world and the PUMC as well. There were some 500 attendance including guests in and out of China, faculties and students of the PUMC. After the symposium, Christine and her friend Ms. Guan whose father was a colleague of Professor Hsien Wu in the early days at PUMC, had visited the PUMC, in particular, they visited the Hsien Wu Memmorial Library at the

current Department of PUMC for the first time.

In early 2007, I have received a letter from Ray, which described important events happening and the activities of his family and himself in the year of 2006. As Ray was busy as usual and his schedule was mostly occupied by his work and invited visiting trips all over the world, I could not even believe that he was an aged scientist with serious heart disease.

Professor Ray Wu had lived a simple but replenish life. Because of his sincerity, patience and persistence, he had successfully helped to initiate the CUSBEA program in the 1980s for training talent Chinese students in the US and to benefit China in the long run. Later on, he had generously established an honorary Professorship and a Memorial Library at the PUMC to commemorate his late father Professor Hsien Wu. These activities not only benefit the Department of Biochemistry directly, but also set up Professor Hsien Wu a model scientist for the younger generation to follow.

Although Ray had left, the “family tradition” advocated by Hsien Wu and developed by Ray will be carried on from generation to generation not only in his loving and supportive family but also in the Department of Biochemistry at the PUMC as well.



Ray Wu with Yufei Shen (second from left) and Depei Liu (far left) and other Chinese biochemists of a CSBMB symposium on gene regulation at WuYi mountain, Fujian in 1999

### **An epilog**

I have been invited in some occasions to either write articles or present anything orally to memorize Professor Hsien Wu in the past, and in memory of Professor Ray Wu's passed away in 2008, I have taken them all as an honor. This was not only because of the contributions of both Professor Hsien Wu and Ray Wu to PUMC and world wide, it is also for the lady Mrs. Hsien Wu in between. I had communicated with Mrs. Hsien Wu in her last two years and was affected by her caress and encouragement to both of the first two Hsien Wu professors, Pan Hua-zhen and me in her life time. Besides, I was thrilled when Mrs. Wu wrote me that

she had known my mother ever since their high school days together and at the PUMC in the 1920s<sup>3</sup> that I felt she was much closer to me.

Even though, as I was unable to make my trip to join Mrs. Wu on her 90th birthday in New York City that she had invited, I had missed the chance of meeting her. However, I was still lucky not only for being awarded the honorary title but also for having been close with her in her last years. As Mrs. Hsien Wu wished “that your continued contribution to biochemical research will bring credit and honor to the Hsien Wu Professorship”, I decided to do my best in my research and graduate teaching to make the honorary Hsien Wu professorship more rewarding.

Personally, I did not have much chance to be with Professor Ray Wu, for the most, it was some short chats in a couple of biochemistry meetings in China. We usually communicated through letters, Fax and more recently via e-mails regarding the establishment and maintenance of the Hsien Wu Library. I had regularly sent annual reports and occasionally on the running conditions of the Library to Ray when I was taking responsibility for the library between 1993 and 2002. Ray always responded quickly to give comments, solutions or suggestions on any of my questions.

Consequently, most of the issues on Ray that I have written here were either quoted from some references listed below or described to me directly by his friends of the old days in Peking. However, while trying to summarize Ray's life long practice, I happened to have thought of the famous motto of the Yenching University “Freedom through Truth for Service”. As I was once a Pre-Med student of the Yenching University in the early 1950s, I have read and heard of many students of the 1940s who were inspired or guided by the motto to initiate their character and mettle through out their life. “Whether Ray Wu was one of them” is a question that would never be answered!

Professor Ray Wu had gone peacefully on February 10, 2008 in his recovery from a heart operation. He will be remembered by his friends in China, in particular, faculty members and students at the PUMC.

### **Footnotes:**

- 1 Hsien Wu was born on November 24, 1893. The Commemoration for the Centennial Anniversary of Dr. Hsien Wu at PUMC was originally set in November 1993, which was later postponed to December 1993 to meet Ray's schedule.
- 2 The Commemoration Symposium was first scheduled in fall 2003, however, as the epidemic burst of severe atypical respiratory syndrome (SARS) in Peking, it was postponed to the summer of 2004.
- 3 My mother Dr. Katherine T. Chen (陈翠贞) was a M.D. graduate of the Johns Hopkins Medical School in 1924 and then a pediatrician at the PUMC in 1924~1927. She was later the founder of both of the first public children hospital in China, “the Children Hospital of the Shanghai

Medical College", and the *Chinese Journal of Pediatrics* in the 1950s. She passed away on April 25, 1958.

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### Author's Biographical Sketch

Yu-fei Shen (沈翊珩) is a Professor of the Department of Biochemistry and Molecular Biology at the Chinese Academy of Medical Sciences & Peking Union Medical College in Beijing. She has been the Director of the WHO Collaborating Centre for Immunological Research since 1992, and the Vice Editor in Chief of the *Journal of Medical Biology* since 2002. In the past, she had been elected the Vice President of the Chinese Society for Biochemistry & Molecular Biology in 2001~2005; the Chair of the Academic Committee, National Laboratory of Medical Molecular Biology between 1994~2004, and was the chair of the VIth Asian Conference on Transcription. In 1951, she entered the previous Yenching University as a Pre-Med student at the age of 16 and then graduated from the Peking Union Medical College in 1958. She obtained further graduate training in Biochemistry in the Chinese Academy of Medical Sciences from 1962 to 1966. In 1982, she was accepted by the Rockefeller University to be a Guest Investigator in Molecular & Cell Biology on a competitive WHO fellowship and returned to the Institute in 1984. She has been promoted to become a Professor in Biochemistry and Molecular Biology in 1987. She had then been offered a Visiting Professorship by the Department of Cell Biology of the Baylor College of Medicine, Houston in 1987-1988, and later the second awardee for the honorary title of the Hsien Wu Professor in Biochemistry between 1992~1994. Her major research interests are in the fields of epigenetic mechanisms in the regulation of mammalian genes and the molecular aspects of the interaction between heat shock and immunity.



### Address:

Institute of Basic Medical Sciences  
Chinese Academy of Medical Sciences & Peking Union Medical College  
5 Dongdan Santiao  
Beijing 100005, China  
Email: yfshen@imicams.ac.cn; yfshen@pumc.edu.cn

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- 3 *Chinese Historical Materials of Science and Technology*, 19(4), 51-69. Chinese Science and Technology Press, 1998, Beijing