

People @ Virology

Biography of Professor Huang Zhenxiang



By Dr. Shouchun Cao

Professor Huang (1910--1987)

Huang ZhenXiang, virologists, academician (Chinese academy of sciences), and born in February 10, 1910, Gulangyu, Xiamen city, Fujian province. director of the institute of virology, Chinese Academy of Preventive Medicine.

Main achievements

The new technology of virus culture in vitro laid the foundation for the modern virology, known as the "the second technical revolution in the history of medical virology". He set up the method for virus quantitatively measurement by the naked eye observation which was used to replace the microscope observation. He studied the epidemic of encephalitis virus, and find that there is a difference in nature of the virulence between virus strains. He also

studied the ecology and popular relations, the variation of the rule, virus store method etc. He also invented the use formalin processing measles vaccine All of his research, play a key role to control China encephalitis.

Education Experience

- ✧ In 1930, graduated from the Yanjing University with a master's degree.
- ✧ In 1934, graduated from Beijing Union Medical College with a medical doctor degree.

Work Experience

- ✧ 1934-1941, Served as medical assistant in the Peking Union Medical College Hospital, Beijing.
- ✧ 1941-1942, Visiting scholar in the Rockefeller Institute for Medical Research, Princeton, USA.

- ✧ 1942-1943, Visiting scholar in the Division of Microbiology, Columbia Medical Internal Medicine, New York, USA.
- ✧ 1944-1947, Served as director of Dept. pathology, Chongqing, Central Health Laboratory Service.
- ✧ 1947-1949, Served as Dean of the Peking branch of the Central Health Laboratory Service.
- ✧ 1949-1987, Served as director of the Department of Virology, Central Institutes of Health, and the honorary director of the Institute of Virology, the Chinese Academy of Medical Sciences, Chinese Academy of Preventive Medicine
- ✧ March 25, 1987 died of leukemia in Beijing.



Figure1: Prof. Huang's photo of working

Virus Culture Technology *in vitro*

Beginning of this century, the study of the virus is still immature, and the method is also very backward. Because the virus is the smallest organisms, and it does not own enzyme system, so virus need to parasitic in living cells, and general microbiological culture media can not make the virus reproduction and survival. Scientist usually detected the presence of virus by animals injected that is to say that if the animals were observed incidence or death, then the virus is positive. Obviously this method is very primitive.

The Viral culture is the most basic virus research, If no establishment of new viral culture technology, there is no breakthrough in the research and development of virus. Therefore, many countries have put in a lot of manpower, material resources trying to explore the virus culture *in vitro* for a lot of years. In 1943, Professor Huang published the article of "Further study on the titration and neutralization of western equine encephalitis virus in tissue culture", and this paper immediately drew attracted worldwide attention and has been generally recognized by peers.

This new technology of virus culture *in vitro* is summarized as follows: firstly, Digesting the animal tissues into a single layer of cells, and make such cell live *in vitro* by adding certain

nutrients. Secondly, add the the virus to these cells and inoculated over a period of time, and then the cell will be a series of pathological changes. Observer with an ordinary microscope observation of the cells with or without lesions can indirectly determine whether the propagation of the virus.

This new technology to culture the virus was from laboratory animals and chick (animal level) to tissue culture in vitro (cell level). Scientist of many countries around the world succeeded in discovering the pathogen of many viral diseases by using the technology, and many new viruses were isolated. This new technology discovered by Prof. Huang plays an important role in the virus research. So far, This new technology is still widely used in vaccine development, viral diseases, diagnostic reagents production and virus monoclonal antibodies, genetic engineering and other high-tech research areas. In many countries around the world to adopt this technology for separation such as epidemic hemorrhagic fever, measles, poliomyelitis (polio) virus.

Research on Japanese Encephalitis Virus

The early establishment of the People's Republic of China, encephalitis is one of the

infectious diseases which was a serious threat to the health of people. Because of the limitations of the scientific and technological level, understanding the epidemic of encephalitis is still very superficial. The pathogen, pathogenesis, propagation, diagnosis, immunization and other issues have yet to be resolved.

Prof. Huang had gone for a comprehensive and systematic investigation study on the encephalitis virus. Following a large number of epidemiological investigations, the researchers began to study on virus isolation, the establishment of experimental diagnostic methods, insect media ecology, encephalitis epidemic law and virus transmission. He figure out that mosquito is vector of the spread encephalitis.

In 1949, Prof. Huang firstly began to study the encephalitis vaccine in China. Encephalitis vaccine has been conducting from inactivated vaccine and then developed using tissue culture technology (live attenuated vaccine). The results of these studies are all permeated with the hard work of Prof. Huang. The study of JE vaccine got the the 1978 National Science Conference Award.

As we all know, achievements of the prevention medicine, never rely on an individual alone in the struggle that can be achieved, there

must be a long period, sometimes even generations to work together to obtain. Encephalitis study in China is start from 1949, and after 40 years of work, it has finally been successes and recognized by the scientists. JE vaccine study obtained the Ministry of Health and Technology Progress Award in 1989, but unfortunately Prof. Huang has passed away. Although there is no his name in the list of winners, people will never forget his pioneer status encephalitis studies in China.

Prof. Huang enjoys a high international reputation, and he had visited a dozen countries, such as Soviet Union, Romania, the Netherlands, Egypt, France, the Philippines, and the United States. He had

given the lectures and academic exchanges in above country. He had been awarded the title of "Golden Key" and "honorary citizen" in the United States.

Prof. Huang loves the research of medical virology very much, and he called to create the viruse society of the Chinese Medical Association. He was chief editor of the book of "Introduction of Medical Virology", "common virus disease of experimental techniques", "Chinese Medical Encyclopedia • Virology". He adhere to write the book of "Medical virology base and experimental techniques" and "Dictionary of Medical Virology". in his later years during the sick in the hospital. when the two book were finished, the leukemia claimed his life at age 77 in 1987.



Figure2: Family photo
in Gulangyu,
Xiamen.

(The third person from
right in the back row is
Prof. Huang)