

Article @ Virology

An important pioneer and founder of biological products science in China- Qi Changqing

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ABSTRACT

Qi Changqing was born into a Manchu Family in Beijing in 1896. After the founding of China, Qi Changqing successively served as the first, second and third members of the biological products branch of the medical committee of the Ministry of health, the first and second vice chairmen of Gansu microbial society, the honorary deputy director of Gansu Medical Association and immunology society, the honorary deputy director of Gansu veterinary society, as well as the first and second members of Gansu CPPCC and the third, fourth and fifth Standing Committee. Qi Changqing was patriotic, honest and clean all his life, supported socialism, and was labeled as a "reactionary academic authority" in the "Cultural Revolution" movement. He was criticized and unfairly treated. However, his faith in the party and socialism remained unchanged. He joined the Communist Party of China at the age of 86 in 1982. In recognition of Qi Changqing's contribution to national health and epidemic prevention, he has been approved to enjoy the special allowance of the State Council since 1991. Qi Changqing died in Beijing in 1992 at the age of 96.

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Qi Changqing graduated from Beiyang army veterinary school in 1918. In 1919, the government of the Republic of China established the central epidemic prevention department, Qi Changqing was recommended by the school to participate in the work of the epidemic prevention office as a technical assistant, responsible for the feeding and management of experimental animals and horse immunization. In 1924, Qi Changqing, then director of the vaccination Office of the central epidemic prevention department, was sent to the Institute of Infectious Diseases of Imperial University in Tokyo Japan for further study, mainly studying the manufacture of tetanus antitoxin and vaccine production. In 1925 returned to China, he served as the chief technician of the epidemic prevention department, responsible for tetanus horse immunization, serum antitoxin production, and vaccine research. In 1935, he was ordered to prepare for the establishment of Mengsui epidemic prevention department, and Qi Changqing was appointed acting director. When the war of resistance against Japan broke out in 1937, the central epidemic prevention department was ordered to move south, and the Mengsui epidemic prevention department was also merged with the northwest epidemic prevention department. After Qi Changqing handed over the equipment and files of the Mengsui epidemic prevention department, he was employed by Hong Kong Xiehe pharmaceutical company and prepared to

build a serum factory to produce tetanus antitoxin for military and civilian use in the mainland. At the end of 1941, after the fall of Hong Kong, the Xiehe serum factory was occupied by the Japanese army. Qi Changqing was unwilling to work for the Japanese. He managed to leave Hong Kong and return to Beiping. He produced vaccinia vaccine for private use with his old colleague veterinarian Pang dunmin, and studied lactic acid bacteria in small private factories. He was determined not to produce military biological products for the Japanese. It shows the national integrity of an intellectual in old China. After the victory of the war of resistance against Japan in 1946, Qi Changqing was invited by the Ministry of health of the Nanjing government to serve as the technical director of the central biological drug experiment department and the director of the northwest Epidemic Prevention Department of Lanzhou. Later, he was changed to the Lanzhou Branch of the central biological experiment department and still served as the director. On August 26, 1949, the Lanzhou Branch was taken over by the people's Liberation Army. Under the leadership of director Qi Changqing, the northwest biological experiment department resumed production within three days. The northwest military and political Commission renamed the office northwest biological experiment institute and appointed Qi Changqing as its director. In 1953, it was changed to Lanzhou Institute of biological

products of the Ministry of health, and Qi Changqing was still appointed director of the Institute. Qi Changqing has been engaged in biological products all his life and made important contributions to the development of China's biological products industry. In particular, the vaccinia virus "Temple of heaven strain" established by him and his colleagues has made outstanding contributions to the prevention and eradication of smallpox in China, making China 15 years ahead of the global eradication of smallpox.

1. Establish the "Tiantan strain" to eliminate smallpox

In February 1926, a Northwest Army soldier named Liu Guangsheng was admitted to Beijing hospital because of smallpox. At that time, Qi Changqing went to the hospital to observe the patient, took the scab skin with blister slurry, ground it and inoculated it on the monkey's skin. After inoculation, it became acne, and then propagated it to another monkey's skin. After the monkey's skin was propagated for 2 generations, Qi Changqing took the monkey's acne slurry and inoculated it on the rabbit's skin and testicles, and propagated it for 5 generations, then transferred it to the calf's skin, and propagated it on the calf's skin for 3 generations. After testing, the virulence is similar to that of Japanese vaccinia virus, so it is determined as "Tiantan strain" vaccinia virus, which is used for vaccinia production in China. In 1954, China launched the

campaign to learn from the Soviet Union, adopted the Soviet Morozov vaccinia virus, and produced vaccinia according to the Soviet regulations for vaccination. The smallpox epidemic occurred in Moscow in 1960, so the immune effect of Morozov vaccine was questioned at the smallpox experience exchange meeting. It was suggested to compare the "Tiantan strain" vaccine virus with the Soviet strain, and Lister strain (international reference strain), Danish strain (strong strain) and EM-63 strain (weak strain) were used as test comparison control. After three years of research and experiment, the results showed that Tiantan strain had the best immunogenicity. The immune response in animal test was close to the virulent strain. The immune response of the first born children was no different from that of the Soviet strain. The incidence of child pox of the Soviet strain was higher than that of the Tiantan strain. These conclusions affirmed the Tiantan strain, so the "Tiantan strain" virus species in China were replaced to produce vaccinia until the global eradication of smallpox in 1979.

China's eradication of smallpox, the "Tiantan strain" has made great contributions, and Qi Chang the founder of the temple of heaven strain, has made great contributions. After smallpox was eliminated, there were several reports of misdiagnosis of smallpox in China. Qi told everyone that smallpox was eliminated. Some young doctors have not

seen smallpox patients, and the misdiagnosis is understandable.

2. Fixed "Beijing strain" to control rabies

Another great contribution of Qi Changqing is the fixation of rabies vaccine strains. In 1931, Beijing health office killed a rabies dog. Mr. Yuan Junchang isolated a rabies virus from the rabies dog's brain. Qi Changqing and Li yanmao in the central epidemic prevention Office passed rabies virus (street virus) in the rabbit brain. The death time of rabbits from 1 to 10 generations was mostly between 10 and 26 days. After 30 generations, the virulence was stable and the disease occurred 6 days after inoculation, which has been developed by "street virus" become a "fixed virus" rabies virus strain. At that time, it was named "China strain" and later changed to "Beijing strain".

The strain has good immunogenicity and stable toxicity. It has been used in the production of rabbit brain or sheep brain rabies vaccine. Due to the severe vaccination response of brain tissue and the need for 14 injections, it has been gradually eliminated by countries all over the world. China has also begun to study and produce cell vaccine. Since 1958, the number of rabies cases in China has decreased greatly, and only three health research institutes in Changchun, Wuhan and Lanzhou produced rabies. In 1965, under the leadership of Wuhan Institute and the cooperation of Changchun and Lanzhou Institutes, the "Beijing strain" was alternately subcultured in guinea pig's brain and hamster kidney cells. After 15 years (1965-1979), an adaptive strain on hamster kidney cells was obtained and named "aG strain". It is still used in the production of human rabies vaccine.

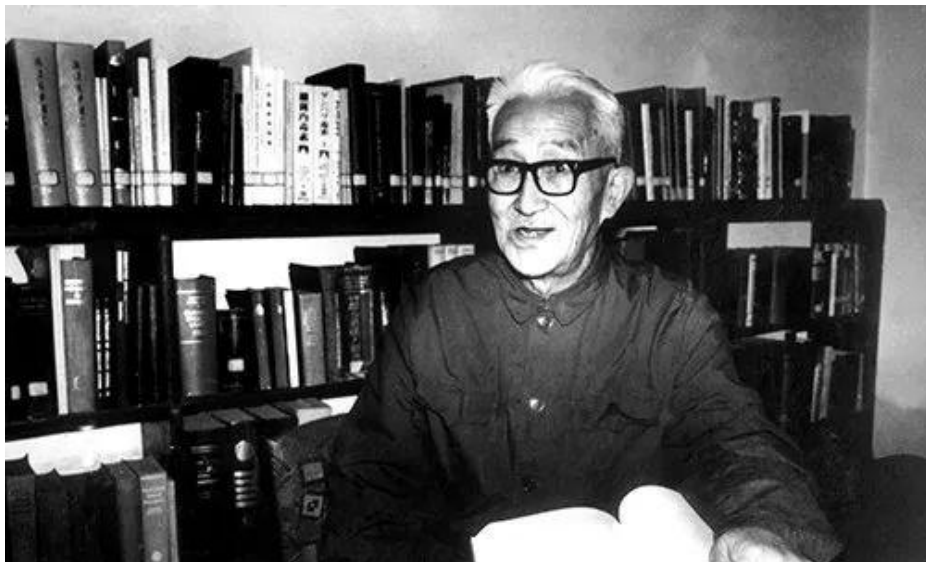


Figure: Photo of Mr. Qi Changqing's 80 years old (taken in the spring of 1980)

3. Draft feeding management regulations to promote the cause of experimental animals

Qi Changqing has been engaged in the breeding of experimental animals since he started working in 1919. When he returned from abroad in 1925, he brought back Japanese guinea pigs, which has accumulated some experience in the breeding and management of experimental animals. The first experience exchange meeting on experimental animals was held in 1957. Qi Changqing said that there are still many problems in the work of experimental animals, which need us to explore and study, such as genetics and breeding, feed nutrition, sterility, reproduction and so on. Combining foreign experience with domestic actual situation, he presided over the drafting of China's first small animal feeding and management regulations, which was approved by the Ministry of health in April 1958 as the trial regulations for small animal feeding and management. This is China's first experimental animal feeding and management regulations, which has laid the foundation for experimental animal feeding and management.

4. Pay attention to practice and study rigorously

Qi Changqing paid attention to practice and did everything himself. During the initial production of vaccinia, personally observe the growth of vaccinia, wait in the bullpen day and night, and carefully record and

observe the development and changes of vaccinia, from rash to grouting scab. In 1957, he observed that there were a large number of lymphocytes, lymphoblasts and plasma cells in the blood of immunized horses. Under the guidance of Qi Changqing, serum antitoxin was prepared. The preparation process was from original preparation to concentrated preparation and then to refining, and the quality was gradually improved. Qi Changqing attaches great importance to production safety and product quality. Biological products are very dangerous. We should not only prevent our own infection, but also prevent the leakage of toxic bacteria, but also prevent the pollution of biological products. We should be careful at every step. He also said that all biological products must be "quality first" and safe and effective, which is the gold standard for testing quality. There can be no deception at all. As Mr. Qi Changqing said, "there is no section in the work of biological products" and "biological products have no defective products". Every producer and scientific researcher should be responsible for life.

Qi Changqing devoted all his life to the cause of biological products and made outstanding contributions to the protection of human health. He left a wonderful chapter in the history of Chinese biological products. His serious, rigorous and practical scientific attitude also had an important impact on the scientific research spirit of later researchers. Let us always miss Mr. Qi Changqing.

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