

Japanese scientists who failed to get Nobel prizes

Nobel prizes started in 1901. Numbers of excellent Japanese scientists have failed to get the Nobel prizes, even if their findings were comparable with or even excellent to western scientists. A brief review of such regrettable histories is presented.

Prof. Shinya Yamanaka (1962-)



Novel prizier

2012 The Nobel Prize in Physiology or Medicine
He established iPS cell (induced pluripotent stem cell) applicable to various fields of regenerative medicine.

He has proved that the introduction of a small set of transcription factors into a differentiated cell is sufficient to revert the cell to a pluripotent state.

Prof. Satoshi Omura (1935-)



Novel prizier

2015 The Nobel Prize in
Physiology or Medicine

He found avermectin from
Streptomyces avermitilis in
the soil of Kawana, Ito-city,
Shizuoka, Japan.

Ivermectin is now widely
used for treating patients
with roundworm diseases
(onchocerciosis,
elephantiasis and
strongyloidiasis) and
scabies.

Prof. Shimon Sakaguchi (1951-)



2025 The Nobel Prize in Physiology or Medicine

Prof. Sakaguchi, a specially appointed professor at the University of Osaka's Immunology Frontier Research Center, discovered regulatory T cells (Tregs). Tregs suppress reactions to self-produced antigens and allergies that could damage the body's own tissues. They act like a set of brakes on the autoimmune system to prevent autoimmune diseases.

Novel prizier

Novel prizers



Prof. Barry James Marshall (internist) (1951-)



Dr. Warren is the very first Nobel prizier among the diagnostic pathologists.



2005 The Nobel Prize in Physiology or Medicine
They isolated *Helicobacter pylori* from the gastric mucosa, and significantly contributed to the therapy of various gastric disorders, including gastric ulcer.

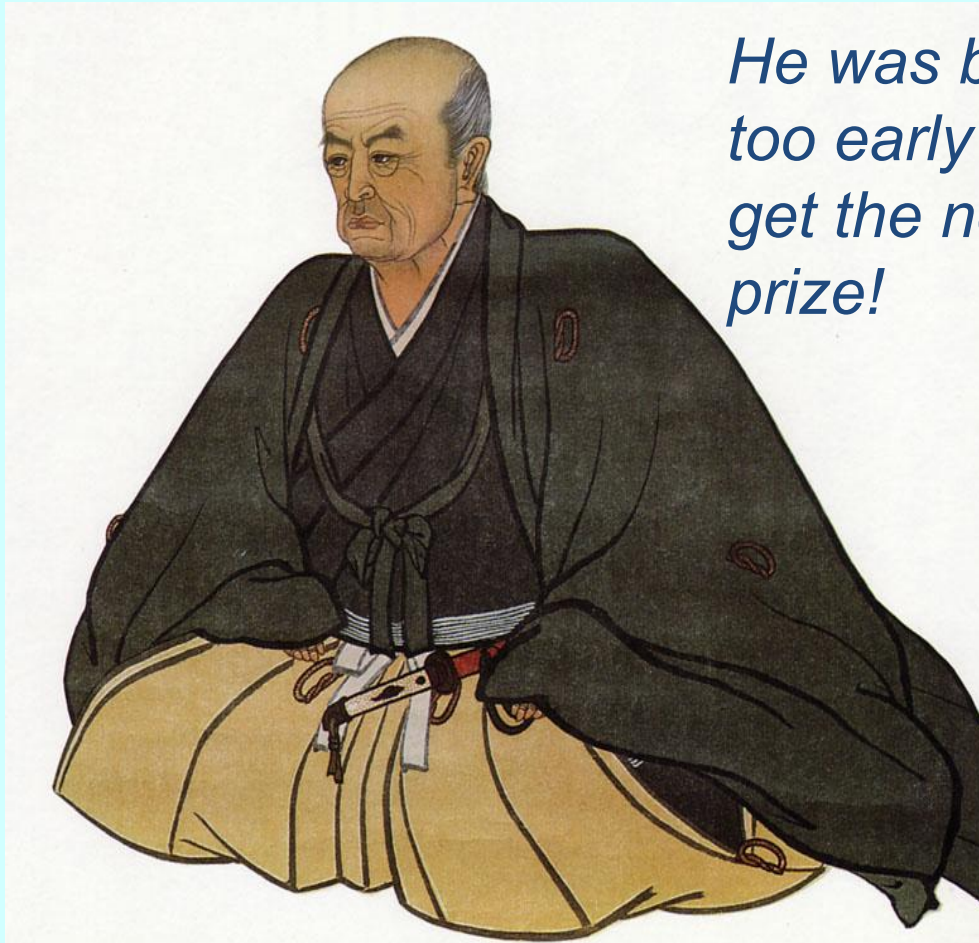
Dr. John Robin Warren (diagnostic pathologist) (1937-)

Old tale: Intestinal metaplasia of the stomach and *Helicobacter pylori*

In 1981, Dr. Barry James Marshall (resident) and Dr. John Robin Warren (veteran diagnostic pathologist) proved, in Australia, *Helicobacter pylori* is a causative microorganism of peptic ulcer. In the same year, I (Yutaka Tsutsumi, a Japanese pathologist with the same age with Dr. Marshall) have started to study intestinal metaplasia of the stomach with histochemical techniques, and proposed the possibility that intestinal metaplasia is an adaptation to long-standing chronic gastritis presumably caused by bacterial infection.

Ref.: Tsutsumi Y, et al. Immune aspects of intestinal metaplasia of the stomach: an immunohistochemical study. Virchows Archiv A [Pathol Anat Histopathol] 1984; 403: 345-359. doi: 10.1007/BF00737285

Seishu Hanaoka (1760-1835)



He was born too early to get the novel prize!

On October 13, 1804, he succeeded the world first surgery for a 60-year-old breast cancer patient under the general anesthesia in Hashimoto, Wakayama, Japan. The patient survived for more than 20 years.



A lady with breast cancer illustrated by Seishu

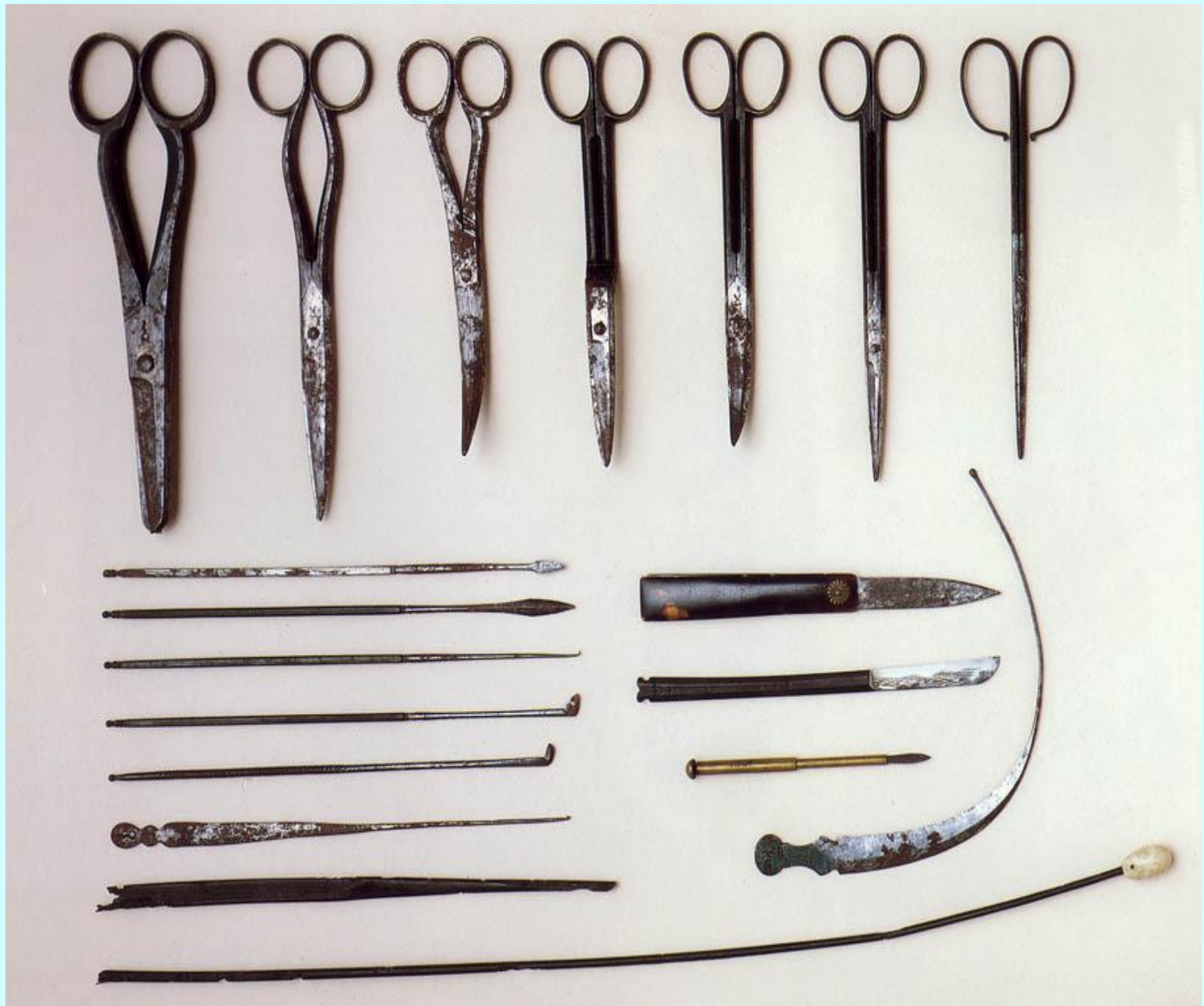


Seishu Hanaoka

Atlas for breast cancer
operation (1804)

General anesthetics: Tsusensan

**Mafeisan (麻沸散) or
Tsusensan (通仙散), a
mixture of 10 kinds of
herbal extract,
contains atropine and
aconitine as main
components.**



Surgical devices used by Dr. Seishu Hanaoka

Dr. Kanehiro Takaki (1849-1920)



He was the top medical officer of the Imperial Japanese Navy. Beriberi (vitamin B1 deficiency) was considered seriously endemic to Japan, and also was a serious problem on warships. Scientists considered beriberi as a bacterial infectious disease. Dr. Takaki succeeded to reduce the number of beriberi soldiers by changing the diet menu on the warship to include vegetables and meat. At that time, numbers of western scientists got the prize on vitamin-related studies, particularly on vitamin B1.



“Takaki Peninsula” in the Antarctica was named after his excellent vitamin work.

Dr. Umetaro Suzuki (1874-1943)



As a professor of agricultural chemistry at Tokyo Imperial University, he succeeded in extracting a water-soluble complex of micronutrients from rice bran, and named it aberic acid. The aberic acid (actually vitamin B1) showed effects on curing patients of beriberi. If he intimately collaborated with Dr. Kanehiro Takaki and Shibasaburo Kitasato, these Japanese scientists might get the Nobel prizes.

Prof. Katsusaburo Yamagiwa (1863-1930)



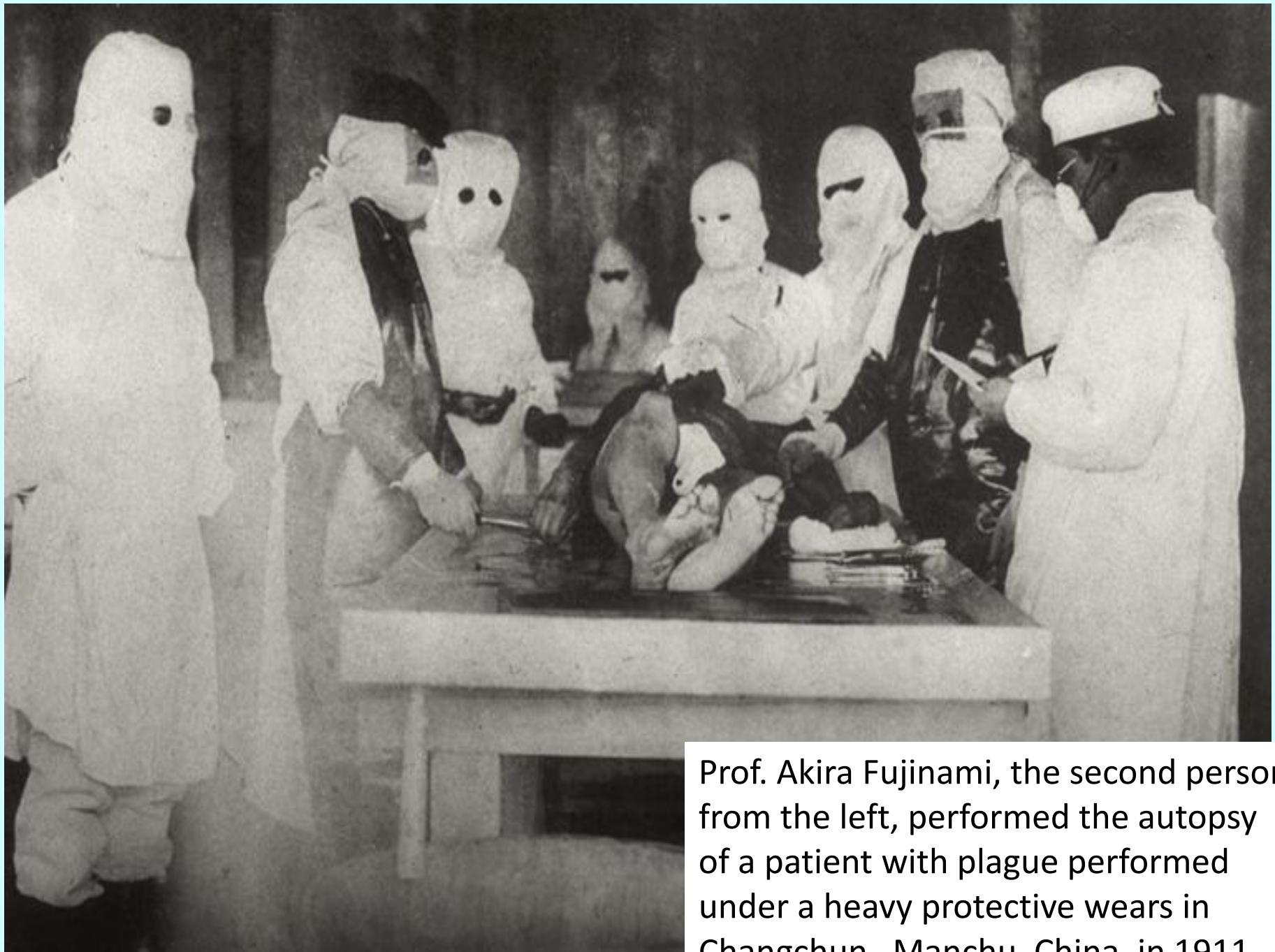
As the professor of Imperial University of Tokyo and the founder of the Japanese Society of Pathology, he extensively promoted cancer research in Japan. Yamagiwa and his assistant Koichi Ichikawa induced squamous cell carcinoma on the ear of rabbits using coal tar, for the first time in the world, demonstrating the chemical carcinogenesis.

Prof. Akira Fujinami (1870-1934)



As the 1st professor of pathology in Kyoto Imperial University, he found chicken Fujinami sarcoma virus, and established the viral carcinogenesis. He also significantly contributed to the pathogenesis of Japanese schistosmiasis.

In 1966, Prof. Francis Peyton Rous at Rockefeller University, NY, USA received the novel prize by detecting chicken Rous sarcoma virus. In 1980, Dr. Hanabus's group showed that Fujinami virus is closely related to Rous virus.



Prof. Akira Fujinami, the second person from the left, performed the autopsy of a patient with plague performed under a heavy protective wears in Changchun、Manchu, China, in 1911.

Prof. Shibasaburo Kitasato (1853-1931)



Novel prizes started in 1901. Dr. Shibasaburo Kitasato established novel serum therapy against tetanus in 1889 under Prof. Robert Koch in the University of Berlin. Kitasato and Dr. Emil von Behring, worked together in Berlin in 1890, discovered diphtheria antitoxin serum. von Behring was awarded the 1901 the 1st Nobel Prize, but Kitasato was not.



Dr. Hideyo Noguchi (1876-1928)



Noguchi suffered a burn injury on his left hand, when he was one-year old in Fukushima, Japan. As a researcher at Rockefeller Institute of Medical Research, Noguchi demonstrated the presence of *Treponema pallidum* in the brain with progressive paralysis. He was further involved in the study of Oroya fever, poliomyelitis, trachoma and yellow fever vaccination. He believed that yellow fever was caused by spirochaete bacteria (*Leptospira noguchii*) instead of a virus. He died of yellow fever in Accra, Ghana, Africa at the age of 51. He was nominated as a Nobel prizier several times in the period of 1913-1927.

Prof. Ryokichi Inada (1874-1950)



Ryokichi Inada (left) and Hideyo Noguchi (right)
in Yokohama in 1915

As the 1st professor of internal medicine at Kyushu Imperial University, Fukuoka, he found *Leptospira* pathogens in Weil's disease, and established the pathogenesis of leptospirosis, in collaboration with Dr. Yutaka Ido. In 1915, Inada met Dr. Hideyo Noguchi in Yokohama, and discussed with him on the cultured *Leptospira*.

Prof. Yutaka Ido (1881-1919)



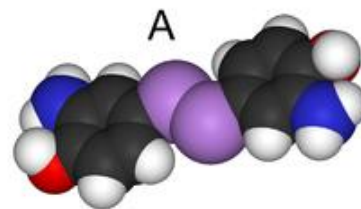
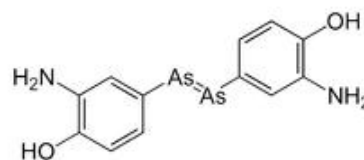
Yutaka Ido, the 2nd professor of Internal Medicine, Kyushu Imperial University, Fukuoka, worked with Prof. Ryokichi Inada on leptospirosis (Weil's disease). He found the pathogen *Leptospira ikterohemorrhagica* and clarified the pathogenesis. He and Prof. Inada were nominated as candidates of the Nobel prize. In 1918, Hideyo Noguchi welcome him in the West Coast, USA. He died of typhoid fever at the age of 37.

Dr. Sahachiro Hata (1873-1938)



Hara with Prof. Paul Ehrlich

Sahachiro Hata researched bubonic plague with Shibasaburo Kitasato. In Paul Ehrlich's laboratory, Frankfurt, Germany, Hata found the compound 606, arsphenamine, was effective for treating syphilis. The arsenic compound, arsphenamine (Salvarsan), was called as "magic bullet". The word Salvarsan is composed of "Salvator" and "arsenic". This was the very first man-made antibiotic.



Salvarsan

Prof. Kiyoshi Shiga (1871-1957)



In 1897, Kiyoshi Shiga identified *Shigella dysenteriae* causing dysentery and its exotoxin, the Shiga toxin, produced by the bacteria. Repeated trials on Shiga toxin-based vaccine failed to achieve immunity. He was also involved by the study of tuberculosis, leprosy and trypanosomiasis. He became the president of Keijō Imperial University in Seoul, Korea.

Dr. Jokichi Takamine (1854-1922)



Jokichi Takamine, a Japanese chemist and businessman, isolated in Tokyo the enzyme Takadiasthase from *Aspergillus oryzae*, a fungus used in the manufacture of soy sauce and miso. As a businessman, he sold Takadiasthase in the USA. In 1901, under the assistance by Keizo Kaminaka, he isolated and purified the hormone adrenalin from the adrenal gland, and this became the very first isolation of hormones from the living bodies. Adrenalin functioned the first effective bronchodilator for asthma.

Dr. Sunao Tawara (1873-1952)



Sunao Tawara is a Japanese pathologist known for the discovery of the atrioventricular node (node of Tawara). In 1903-1906, he spent in Philipps University of Marburg in Marburg, Germany, and studied pathological anatomy under Prof. Ludwig Aschoff. Tawara's monograph (a single-author's book), "Das Reizleitungssystem des Säugetierherzens" (English: "The Conduction System of the Mammalian Heart") was published in 1906.

Prof. Gen-ichi Kato (1890-1979)



Gen-ichi Kato is a Japanese physiologist and the 1st professor of physiology of Keio University, Tokyo. In 1923, he established the neuroconduction theory on non-decremental conduction. In 1926, he displayed the open experiment in the International Physiology Congress in Stockholm. Prof. Ivan Petrovich Pavlov guaranteed his getting the Nobel prize, and he was actually nominated as a Nobel prizier several times, but in vain.