

ROBERT KOCH INSTITUT



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A Historical Retrospective

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Robert Koch

The 1840s were the age of Biedermeier and pauperism but they were also shaped by industrialisation, urbanisation and the »Social Question« in Germany. Despite the gradual increase in life expectancy infant mortality was high. Adults died of the »national epidemic« tuberculosis when cholera epidemics weren't raging through the country. The situation into which Robert Koch was born in December 1843 was characteristic for the period. He was the third son of a total of 13 children of a miner in the Harz region; only two did not survive childhood. Five of the siblings left Clausthal and emigrated to the USA and Mexico.



Although he actually wanted to become a teacher, Robert Koch studied medicine. This reflected his interest in nature. Already as a child he had collected insects and minerals. He started doing experimental work on anthrax in 1876 in his Wollstein residence. Microscopic drawings in the makeshift laboratory were followed by the first microphotographs in 1877/78.



From Wollstein he was appointed to the Imperial Health Office in Berlin in 1880. This was where he finely tuned, amongst other things, the bacteriological methodology that was to prove just as useful for research into epidemics as it was for the development of preventive measures like disinfection.

Koch's paper on the »Aetiology of Tuberculosis«, which he gave on 24 March 1882, established his scientific renown. One year later he embarked on his first expedition to Egypt and India to study the cholera epidemics there. Koch succeeded in detecting the pathogen in excretions from the patients under the microscope, too, and in identifying the aetiology of the epidemic.



Tuberculosis and cholera continued to be important research subjects. The goal was either to prevent infectious diseases or to control epidemics through targeted measures. In the case of the endemic disease, tuberculosis, efforts were directed towards vaccination particularly as the external living conditions at the time were unfavourable. The cholera outbreak in Hamburg in 1892 revealed that the quality of drinking water was of crucial importance.

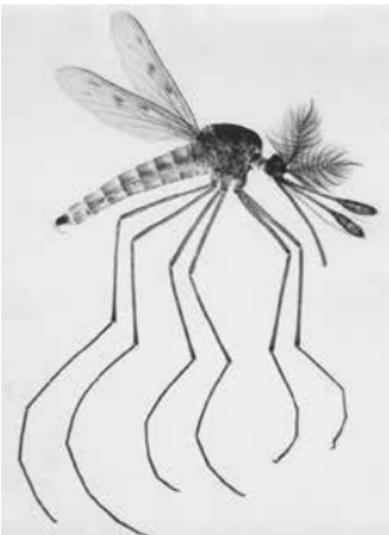
The hopes of finding an effective treatment or even a tuberculosis vaccine were dashed in 1890. Tuberculin was, however, a means of rapidly and reliably detecting infection. The success of Koch's staff at the University's Hygiene Institute and his own important methodological work led, at the end of the 1880s, to plans for a new Institute to carry out research into infectious diseases.

On 1 July 1891 the Royal Prussian Institute for Infectious Diseases was opened for Robert Koch. Nine years later it relocated to Nordufer in Berlin Wedding. The institution still bears the name of its founding father today. International cooperation and contacts were the dominant features of Koch's personal work style and the atmosphere in the various departments.



In 1896 he began his own research work on various tropical diseases which led to further international cooperation. The research areas initially encompassed animal epidemics in southern Africa including Rinderpest, Texas Fever, East Coast Fever and Equine Plague. He was equally interested in human diseases where the transmission routes were as yet unknown, in particular malaria and sleeping disease. Malaria was still widespread in Europe, too, up to the end of the 20th century. The plague and leprosy, by contrast, are still known and feared diseases in tropical countries today. Between 1896 and 1907 Robert Koch spent 10 years travelling, six in Africa, the remaining time in South-East Asia and India. A private trip took him

in 1908 via the USA to Japan where he visited his former staff member Shibasaburo Kitasato. During a short recreational trip Robert Koch passed away in Baden Baden in 1910. At his own behest he was cremated and the urn containing his ashes was returned to Berlin.



Curriculum Vitae

Education and Personal Details

- 11.12.1843 Born in Clausthal/Harz
- 02.04.1862 Final school-leaving certificate (Abitur)
- 1862–1866 Studied medicine in Göttingen
- 10.01.1866 PhD in Göttingen,
Study visit to Berlin
- 12.03.1866 License to practice medicine
- 16.07.1867 Married Emmy Fraatz



- 1870/71 War between Germany and France,
Army hospital service
- 16.03.1872 Intermediate preclinical examination
- 06/1893 Divorce from Emmy Koch
- 13.09.1893 Married Hedwig Freiberg



- 01.10.1904 Retired at his own request
- 11.12.1905 Nobel Prize Award ceremony in
Stockholm
- 1908 Visit to Kitasato in Japan and relatives
in the USA
- 05/1910 Recreational stay in Baden-Baden
- 27.05.1910 Died in Baden-Baden
- 30.05.1910 Cremated in Baden-Baden

Activities up to 1880

- 1866 Medical clerkship at the
General Hospital in Hamburg
- 1866 »Education and care facility for
mentally handicapped children«
in Langenhagen near Hannover
- 1868 Physician in Niemegek/Potsdam
- 1869 Physician in Ragkwitz/Posen
- 1872 Appointment as the district medical
officer in the district Bomst,
Posen Province
Place of residence: Wollstein



Berlin

- 1880–1885 Government councillor in the Imperial
Health Office
- 1885–1891 First Professor for Hygiene in Berlin,
Friedrich Wilhelms University
- 1891–1904 Director of the Royal Prussian
Institute for Infectious Diseases



Expeditions and Congresses

The list of expeditions which Koch embarked on to carry out research into various infectious diseases and the important congresses which he attended, testify to the diversity and the mobility of a research scientist at a time when travel was not easy.

1883–1884	Cholera in Egypt and India
1885	International Sanitary Conference/ Rome
1896–1897	Rinderpest in South Africa
1897	The plague in India
1897–1898	The plague, malaria, Texas fever and tsetse-fly disease in East Africa
1898	Malaria in Italy
1899	Malaria and quinine in Italy
1899–1900	Malaria in Batavia (Jakarta) and New Guinea
1901	International Tuberculosis Congress in London
1901–1902	Malaria on the Brionian Islands (Istria)
1903–1904	East Coast Fever and Equine Plague in British South Africa
1904–1905	Tsetse-flies and trypanosomes in East Africa (private expedition)
1906–1907	Sleeping disease in East Africa
1908	International Conference on Sleeping Disease in London
1908	International Tuberculosis Congress in Washington D.C.

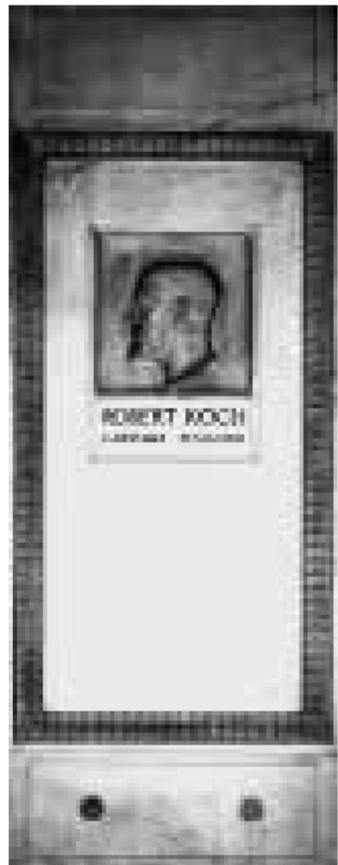
Robert Koch's Mausoleum

On 10 December 1910 Robert Koch's ashes were laid to rest in his Institute. On his birthday the scientific world paid tribute to the internationally renowned academic.

His ashes could be buried on Nordufer because at that time Prussia had not yet passed any laws about the burial of urns. Crematoria were only just beginning to appear. Cremations were part of a modernisation movement that also drew on arguments related to hygiene.

Opposite the auditorium a large room was selected as his tomb and adorned with marble in various colours. In the west wall there is a white marble ledger with the relief portrait of Robert Koch which was fashioned by the Berlin sculptor, Schmarje. Below this, the bronze urn with his ashes rests in a niche sealed with a white marble slab. The eastside of the Mausoleum bears the inscription »Robert Koch – Work and Achievements«.

The mausoleum is both a tribute to and reflection of the great esteem in which the research scientist and human being was held by his staff, colleagues and friends. It was their wish to share this tribute with later generations and, at the same time, to ensure that the research institute could always remain on this site in line with the wishes of Robert Koch.



The Koch Institute

When Robert Koch first came to Berlin in 1880, he worked for the Imperial Health Office. The Office was founded in 1876 and was not equipped with a chemical and hygiene laboratory on Luisenstrasse 57 until 1879. Koch's first staff members in the new bacteriological laboratory were Georg Gaffky (1850–1918) and Friedrich Loeffler (1852–1915). They both followed in his footsteps as Director of the Institute on Nordufer. Between 1885 and 1891 Robert Koch was the first



Professor for Hygiene at the Berlin Friedrich Wilhelms University. Although the idea of setting up a research institute had been under discussion since 1887, it was the 10th International Medical Congress in 1890 in Berlin that actually triggered the establishment of an »Institute for Infectious Diseases« for Prussia. Since its opening on 1 July 1891 the »Koch Institute«, as it was already called prior to its inauguration, assumed tasks for towns and Reich authorities. It also responded to international enquiries, mostly by way of expert opinions on the basis of experimental work.

The first location was next door to the Charité Hospital, the largest and oldest hospital in the city of Berlin. The scientific department was set up in a converted residential building which was called the »triangle« because of its ground plan. The hospital department was lodged in individual barracks on the Charité site to the east of the rail tracks.

The stakeholders saw this as a temporary solution, not least because there were already plans to extend the Charité Hospital with new, purpose-driven buildings. In 1897 the cornerstone ceremony was held for today's location. The Nordufer and its environs were at that time on the north western edge of the city of Berlin. Incorporation in 1861 and growth in the population led to the belief that the location had been wisely chosen from the angle of the development of Berlin. The construction work was completed in the summer of 1900. On the spacious grounds there were sheds for large and small animals like cattle, horses, sheep and even ferrets and frogs.



At the same time, the fourth city hospital was erected on the other side of the street. Since it opened in 1906 it has borne the name of Rudolf Virchow. A special infections department was run by a physician who was also a staff member of the Koch Institute. The principle of »scientific« and »sickness department« was retained. Further co-operation resulted from the

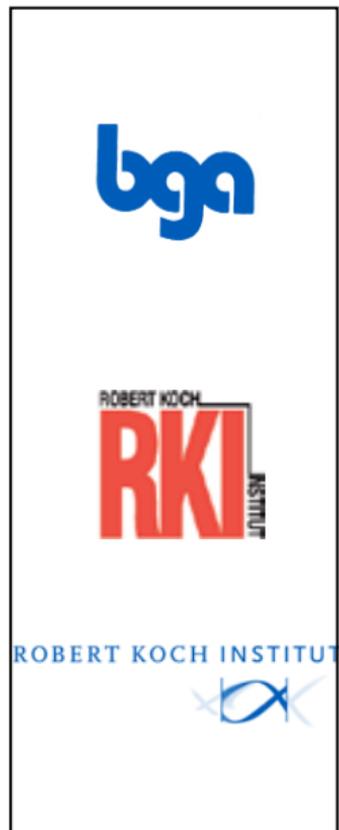


»rabies protection« and other new departments. In 1919 a Medical Examination Office for Berlin and large parts of the Mark Brandenburg was attached which was taken over by the city in 1945 once again.

To mark the 30th anniversary of the discovery of the tubercle bacillus, »Robert Koch« was added to the Institute's name. After World War I the »Royal« disappeared from the name and it was rechristened the »Prussian Institute for Infectious Diseases Robert Koch«. In 1935 the »Institute Robert Koch« was incorporated as a department into the Reich Health Office. In 1942 it became an independent Reich body, the »Robert Koch Institute«.



After the end of World War II, the Robert Koch Institute was assigned in 1945 – with the approval of the allied powers – to the health administration of the city of Berlin. From June 1945 onwards the Institute was given epidemic control tasks by the Magistrate of the City of Berlin following corresponding orders of the Soviet occupying power. In 1952 the Robert Koch Institute became part of the Federal Health Office (BGA) and retained this status until its dissolution in 1994. Since then the Institute has been an independent federal institute with a second large department responsible for health reporting and epidemiology.



The Koch Institute – Chronology

- 01.07.1891 Royal Prussian Institute for Infectious Diseases, location: Schumannstrasse (triangle), Charité, two departments; reports to the Prussian Ministry for Intellectual, Educational and Medical Matters
- 07/1900–1918 Royal Prussian Institute for Infectious Diseases, location: Nordufer, four/six departments
- 29.03.1912 Royal Prussian Institute for Infectious Diseases »Robert Koch«, six departments
- 01.09.1919 Prussian Institute for Infectious Diseases »Robert Koch«, seven departments; in the portfolio of the Prussian Ministry for Public Welfare



- 01.06.1935 Institute »Robert Koch«, ten departments; superior authority: Prussian and Reich Ministry of the Interior (Frick)
- 01.04.1942 Robert Koch Institute
Reich Institute for the Control of Infectious Diseases, nine departments and »outside offices«; Superior Reich Health Director (Conti) and Commissioner for the Reich Internal Administration (Frick)

- 1945–1948 Robert Koch Institute, with former Reich Health Office and Institute for Water, Soil and Air Hygiene, eight departments including inspection office, epidemics station; reports to the Magistrate of Greater Berlin
- 1948–1952 Robert Koch Institute for Hygiene and Infectious Diseases, seven departments (three on Nordufer, four in Berlin-Dahlem); Magistrate, 1950: Senate of Berlin (West)

Federal Health Office/Federal Institute

- 28.02.1952 Robert Koch Institute of the Federal Health Office, four departments (1952–1966), five departments (1966–1994) with 20/23 laboratories
- 1990 Establishment of the Centre for Genetic Engineering
- 01.07.1994 Robert Koch Institute, Federal Institute for Infectious Diseases and Non-transmissible Diseases with the Federal Ministry of Health, six specialist units with 23 specialist areas, locations: Nordufer, General-Pape-Strasse, Wollankstrasse, Wernigerode/Harz
- 01.07.1998 Two departments, one centre, three project groups
- 2002 Foundation of the Centre for Biological Safety
- 20.12.2002 Three departments, one centre and two project groups; locations: Nordufer, Seestrasse, General-Pape-Strasse, Wernigerode/Harz
- 2003 Relocation of the Centre for Genetic Engineering to the Federal Office of Consumer Protection and Food Safety (BVL)

Institute Directors

1891–1904 Robert Koch
1904–1913 Georg Gaffky
1913–1915 Friedrich Loeffler

Robert Koch



1915–1933 Fred Neufeld
1933–1934 Friedrich Karl Kleine
1934–1935 Richard Otto
1935–1945 Eugen Gildemeister

Fred Neufeld



1945–1949 Otto Lentz
1949–1952 Bruno Harms
1952–1969 Georg Henneberg

Georg Henneberg



1970–1984 Raettig, Gillert, Kröger,
Weise (collegial directors)
1985–1990 Wilhelm Weise
1990–1996 Kröger, Weltz,
Hoffmeister
(temporary directors)
1996–2008 Reinhard Kurth

Reinhard Kurth



2008–2010 Jörg Hacker
2010–2015 Reinhard Burger
2015– Lothar H. Wieler

Reinhard Burger



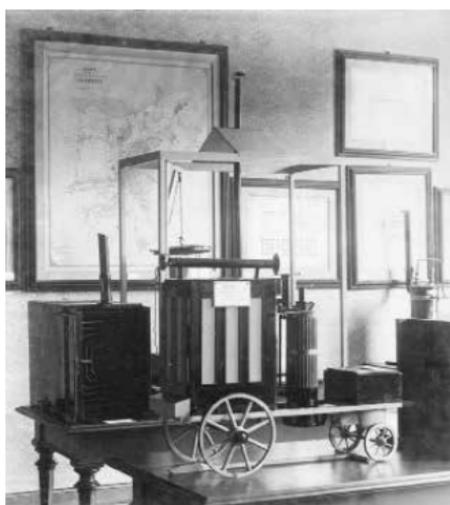
The Museum in the Robert Koch Institute

The first exhibition was officially opened on the occasion of the burial of Robert Koch on what would have been his 67th birthday in the ante-chamber to the Mausoleum. It displayed objects, documents and personal possessions from the scientist's estate.

On completion of the adjacent building in 1913, a larger museum opened on the ground floor. It presented to visitors Robert Koch's diverse areas of work, the Institute's collection and explained the work of the research body.

Some objects probably dated back to the first Hygiene Museum. This museum had been established after the exhibition on hygiene and emergency services at the railway station, Lehrter Bahnhof, in 1883 in the commercial academy on Klosterstrasse. It had

been located next to the Institute of the University of which Koch was the first Director from 1885 to 1891. In the exhibition rooms models, maps and graphs on current health topics could be viewed, for instance on disinfection and sewers.



In 1943/1944 the museum on Nordufer was damaged by bombs that landed in the vicinity. A complete inventory had never been drawn up of Robert Koch's estate or of the Institute's collections. So it was difficult to establish what had been lost and to completely reconstruct the earlier collection.

A museum was once again created following conversion and extension work after the end of World War II in the new building in front of the main building. On the 50th anniversary of the death of Robert Koch, institute staff, politicians and family members of Koch officially inaugurated the museum at its current location.

The exhibition features documents and objects from Robert Koch's estate, e.g. instruments of his research and remains from his expeditions. The spectrum ranges from photos from various periods in his life down to certificates paying tribute to the research scientist and his Institute. International scientific relations, which were initiated by the Institute's founder, are still nurtured today.



The museum exhibits include:

- ▶ Personal file from Wollstein, 1872–1880
- ▶ Promotion to Privy Councillor with the Imperial Health Office in 1882
- ▶ Letter of Appointment as the Director of the Institute for Infectious Diseases



- ▶ Nobel Prize medal
- ▶ Presentation of the Rinnecker Prize by the University of Würzburg
- ▶ Mementoes from his trip to Japan and stones from the Shinto shrine in Tokyo

Other items on display are notes, lecture manuscripts, photos and objects, including:

- ▶ Photos of the life and work of Koch
- ▶ Robert Koch's microscopic preparations and microphotos
- ▶ Microscopes owned by Robert Koch
- ▶ Laboratory equipment
- ▶ Robert Koch's desk

Photos and documents from the history of the Institute round off the exhibition.

Robert Koch's estate

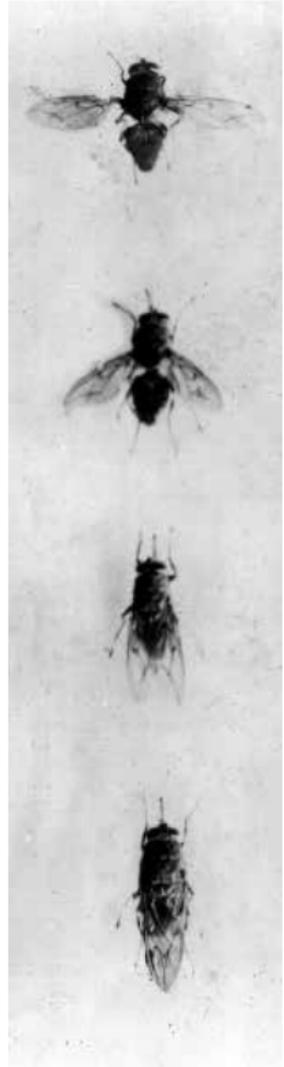
The scientific estate of Robert Koch is kept at the Robert Koch Institute. The archive of the Humboldt University of Berlin has primarily the private part of the estate.

The estate includes a total of about 1500 letters from his correspondence partners around the world. In addition, the estate also boasts some 100 certificates detailing awards and honorary memberships of various scientific societies, in some cases with the related medals.

The documents about his life include his appointment as a Government Councillor with the Imperial Health Office - signed by Kaiser Wilhelm I and the Reich Chancellor Otto Fürst Bismarck – and his appointment as the Institute Director by Wilhelm II.

Numerous manuscripts for lectures and publications as well as notes on different research findings and experiments provide insight into the scientific work of the 1905 Nobel Prize laureate. Furthermore, besides photos there are a few hundred microscopic preparations from Robert Koch's work.





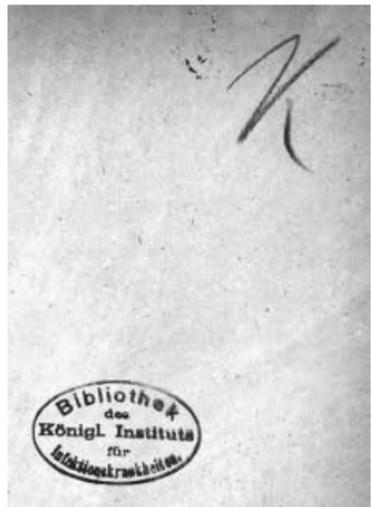
A collection of more than 4,500 old photos and microphotographs constitute the transition to what was once a comprehensive Institute collection. Many of the photos, which are attributable to Robert Koch, were taken on expeditions mainly to Africa. These rare pictures document the research situation as well as the living conditions of the population and nature in East Africa.

The Library

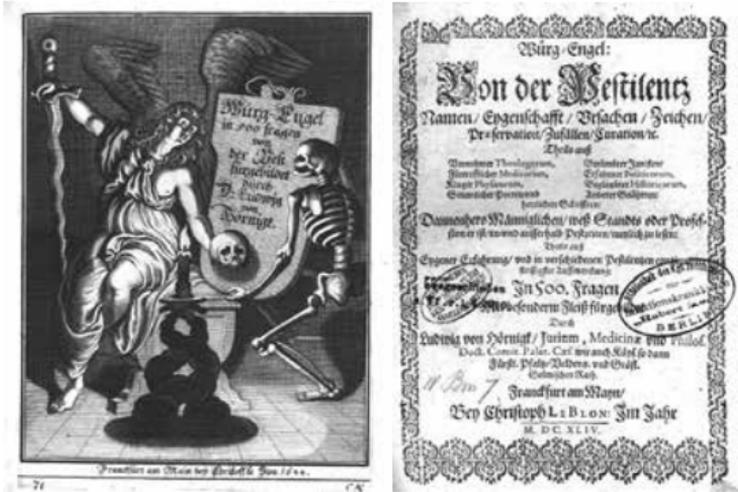
When the Institute for Infectious Diseases was founded, the staff already had more than 1,736 books and journals. With the permission of the Ministry for Intellectual, Educational and Medical Affairs, Robert Koch had been allowed to take them from the Hygiene Institute of the University and the Hygiene Museum on Klosterstrasse to his new research institute. Since then this library has steadily grown. On its relocation to Nordufer the library possessed some 28,000 volumes.



In 1907 Robert Koch sent a letter from Africa to his successor Georg Gaffky informing him of his wish to donate his private scientific library to the Institute. His staff already had access to his collection of books. To distinguish them from the Institute's property, the 2,000 or more books and around 4,500 special prints were labelled with a »K« or »Koch«. In April 1910 the Ministry handed over part of this estate to the Koch Institute.



The exact number of historical books and journals was not recorded at a later date either. In 1932 the library had 32,000 volumes and 12,000 special prints. The oldest book - for instance on the plague - dates back to the year 1511, 60 years after the invention of printing. The »most expensive« book deals with tuberculosis. It was acquired in the year of inflation 1923 for 756 million Marks.



The historical treasure trove encompasses a unique library on the history of epidemics from the early stages of bacteriology. At the same time, the Robert Koch Institute has an up-to-date special library with many regularly updated journals in electronic and print form and around 110,000 books, including approximately 60,000 at the historical location Nordufer.



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Photos/Illustrations

- Title ▶ Institute building on Nordufer, after 1900
- P.3 ▶ Hermann and Mathilde Koch with their children. Third child, back row (from the left): Robert
- ▶ *Bacillus anthracis*. Robert Koch's own drawings and explanations, Wollstein 1876
- P.4 ▶ Microphotograms of the tubercle bacillus (left), Cholera vibriions (right), photos by Emil Zettnow
- P.5 ▶ Ground plan of the Institute at the Charité, 1891 – 1900
- ▶ Photogram of an anopheles, malaria carrier
- P.6 ▶ Emmy Koch, née Fraatz, 1867; R. Koch, around 1865/66
- ▶ Hedwig and Robert Koch on Hawaii, 1908 (picture excerpt)
- P.7 ▶ Koch's residence in Wollstein. Postcard around 1910
- ▶ Institute building on Nordufer, after 1900
- P.9 ▶ The ledger in the Mausoleum for R. Koch, 1960
- P.10 ▶ R. Koch (right) and F. Loeffler, around 1881/8
- P.11 ▶ Animal shed on the Institute grounds Nordufer, around 1930
- ▶ Entrance to the rabies protection building (House 3), built in 1912
- P.12 ▶ Ceremony in the auditorium to mark the transformation of the Institute into a Reich body, 1 April 1942
- ▶ Logos of the Federal Health Office and of the Robert Koch Institute
- P.13 ▶ Heads of Department in the Institute in 1923/24
- P.15 ▶ Five Institute Directors: Robert Koch, Fred Neufeld, Georg Henneberg, Reinhard Kurth, Reinhard Burger
- P.16 ▶ Museum in the Hygiene Institute: Disinfection 1885/91
- ▶ Museum in the Institute »Robert Koch«, about 1930

- P.17 ▶ Museum in the Robert Koch Institute after conversion work in 2000
- P.18 ▶ Appointment of R. Koch as Director of the Institute for Infectious Diseases, certificate, 8 July 1891
- ▶ Programme of a performance to honour R. Koch in Tokyo, 16 June 1908
- P.19 ▶ Nobel prize medal for R. Koch with portrait of A. Nobel
- ▶ Membership of R. Koch in the Prussian Academy of Sciences, certificate 1 June 1904
- P.20 ▶ Zeiss microscope from R. Koch's estate
- ▶ Koch and Kleine dissecting a crocodile, Sese islands, East Africa 1906
- ▶ Tsetse flies
- P.21 ▶ View of the library
- ▶ Ownership sign of R. Koch in books, stamp
- P.22 ▶ Title copper engraving and title page of a book on the plague: L. v. Hörnigk, Würg-Engel: Von der Pestilentz, 1644
- ▶ The auditorium prior to renovation, 1956–2000

In the late 19th century, microscopically small pathogens were identified as the cause of numerous infectious diseases – Robert Koch is considered one of the co-founders of this medical revolution. The history of the Robert Koch Institute is shaped by the visions of its Nobel Prize winning namesake.