

Paul Ehrlich

14.03.1854 Born in Strehlen, Upper Silesia

Father: Ismail Ehrlich, owner of restaurant and lottery agency, superintendent of the Jewish community

Mother: Sara Ehrlich, neé Weigert

1864-1872 Secondary School in Breslau

First ideas about the use of chemistry in medicine (histological colouring) on the suggestion of his cousin Karl Weigert, a famous pathologist and later to become director of the Senckenberg Centre for Pathology in Frankfurt/Main.

1872-1877 Study of Medicine at the Universities of Breslau, Strasbourg, Freiburg and Leipzig completed by his state examination as a medical doctor in winter 1876/1877.

1878 Doctorate in Leipzig, his thesis is entitled „Contributions to theory and practice of histological colouring“, containing, for example, the discovery of mast cells.

1878-1887 Appointed by Prof. Frerich, one of the most famous German clinicians, to the Charité Hospital in Berlin as junior doctor and later as senior physician.

from 1882 Cooperation with Robert Koch. Development of the first direct proof of the existence of mycobacteria on the basis of the bacteria's acid resistance.

Research in the field of colouring agents.

Major contributions to the diagnosis of blood diseases.

Vital staining with methylene blue.

1884 Marriage to Hedwig Pincus, daughter of a Silesian industrialist. The Ehrlichs have two daughters Stephanie and Marianne.

Appointed as titular professor (extraordinary professor) for his research work on the organism's need for oxygen, which he later also demonstrates in his postdoctoral thesis for qualifying as a professor.

1887 “Privatdozent” (outside lecturer) for internal medicine at the University of Berlin. The title of his postdoctoral thesis is: „The organism's need for oxygen. A colour-analytical study“ (1885).

- 1888/89 Departs from the Charité and travels to Egypt and other countries, also for the purpose of curing a pulmonary tuberculosis he had contracted in his laboratory.
- 1890 Establishment of a small private laboratory at the Steglitzer Strasse in Berlin by his father-in-law.  
Fundamental discoveries about immunity to plant poisons.  
  
Appointed as „Professor extraordinarius“ in Berlin.
- 1890-1895 Cooperation with Emil Behring, the founder of the non-specific treatment with homologous serum. Beginning of research on immunity. Development of effective immunisation protocols for the production of high-titer immune sera.  
  
Discovery, analysis and definition of experimentally different antibody qualities and immunoglobuline categories (at that time called antitoxins, precipitins, agglutinins, lysins).  
  
Development of quantitative standardisation methods for antiserum.  
  
During his research on the effect of the diphtheria-antitoxin, Paul Ehrlich discovers that the toxins' poisonous effects on the organism do not work in parallel with their binding capacity on the antitoxins. These observations lead to the development of the theory of side-chains, which is the first consistent concept of immunology („complementary binding reaction“).
- 1891 Appointed by Robert Koch to the newly established Institute of Infectious Diseases in Berlin (today: Robert Koch Institute). There he works on the extraction of diphtheria serum and the determination of its concentration and valency and develops an internationally acknowledged unit of measurement.  
  
First steps in chemotherapy when using methylene blue for malaria therapy at the Moabit Hospital in Berlin, followed by trials with trypanred both without success.
- 1896 Appointed as Head of the „Institute for Sera Research and Serum Testing“ that had newly been established in Steglitz, near Berlin, on the recommendation of the Prussian Head of Government Department Althoff.
- 1897 Appointed as Privy Medical Officer of Health.  
  
Essay on the determination of the valency of diphtheria serum, in which essay he describes his theory of side-chains for the first time.
- 1899 Relocation of the institute from Berlin to Frankfurt. Assumes the position of Head of what is now the „Royal Institute of Experimental Therapy“ which is also entrusted with the state control of the immune sera that

are on the market. The Lord Mayor of Frankfurt, Franz Adickes, and the Prussian Head of Government Department, Althoff, work together very closely on the establishment of Paul Ehrlich's institute.

- 1901 Beginning of cancer research.
- 1902 Establishment of a department of cancer research at his own expense.
- 1903 Awarded the Prussian Great Golden Medal of Science, which had previously been awarded only to Rudolf Virchow.
- 1904 Full Honorary Professor of the University of Göttingen and honorary doctorate of the University of Chicago.
- Beginning of his research work on experimental chemotherapy of trypanosoma infections.
- 1906 Assumes the position of Head of the Georg-Speyer-House for Chemotherapy which had been instituted by Franziska Speyer at the suggestion of her brother-in-law, Prof. Ludwig Darmstaedter.
- Cooperation with the companies Hoechst (Prof. Laubenheimer, then member of the board of directors) and Casella (Arthur von Weinberg, joint-proprietor).
- 1907 Appointed as Privy High Medical Officer of Health.
- Honorary doctorate of the University of Oxford.
- 1908 **Awarded the Nobel Prize** for „immortal contribution to medic and biological research, particularly to the valency determination of sera preparations“, together with Elia Metschnikow, who discovered phagocytosis.
- 1909 Discovery of Salvarsan, the doxy-diamino-arsenobenzol-dihydrochlorid or preparation no. „606“ in a long series of experiments with the objective of developing a preparation for the treatment of syphilis. Preparation 606 works! A major contribution to this success is made by Paul Ehrlich's Japanese co-worker at his laboratory, Sachahiro Hata.
- 1910 **Beginning of chemotherapy for syphilis using Salvarsan.**
- Production of the first large batch of Salvarsan at Hoechst on July 10.
- Renaming of the street „Sandhofstraße“, where the institutes were then located, as the „Paul-Ehrlich-Straße“.
- 1911 Appointed as „Real Privy Councillor“ with the title „Excellency“ (= the highest civilian honour of the Prussian state).

- 1912 Paul Ehrlich is given the freedom of the city of Frankfurt/Main and of his native town Strehlen.
- 14.03.1914 Major ceremony in celebration of his 60<sup>th</sup> birthday.
- 20.08.1915 Paul Ehrlich dies in Bad Homburg following a serious illness.
- 23.08.1915 Funeral at the Israeli cemetery of Frankfurt/Main.

No liability is assumed for the correctness of the information provided. The text has been compiled from the sources stated below by the Press and Public Relations section of the Paul Ehrlich Institute. The sources cited give varying details of some events, such as Paul Ehrlich's year of marriage and the chemical designation Salvarsan is not identical in all the sources.

Sources:

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