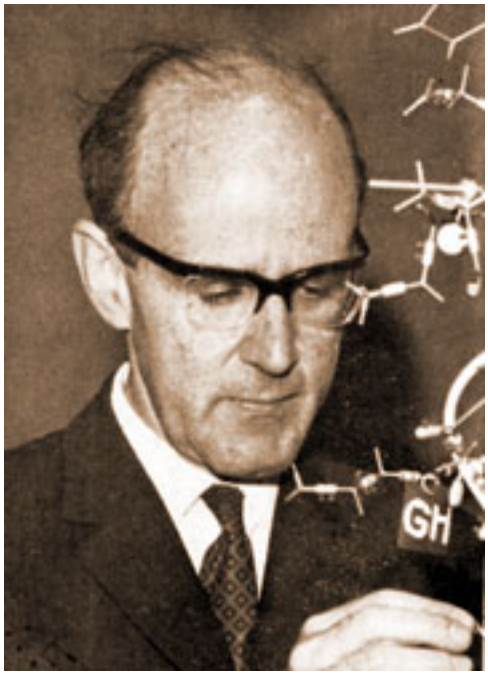
Prof. Max Ferdinand Perutz
Professor of Cellular and Molecular Biology, Medical Research Council Laboratory of Molecular Biology, Cambridge, UK. Nobel Prize for Chemistry, 1962.



Most important awards, prizes and academies

Nobel Prize for Chemistry (1962); Royal Medal of the Royal Society (1971); Copley Medal of the Royal Society (1979); Fellow of the Royal Society (1954); Corresponding Member of the Austrian Academy of Sciences; Associé étranger de l'Académie des Sciences, Paris; Socio straniero Accademia Nazionale delle Scienze, Rome; Socio straniero Accademia dei Lincei, Rome; Corresponding Member of the Bavarian Academy of Sciences; Member of the Akademie Leopoldina; Foreign Member of the Royal Netherlands Academy of Sciences; Foreign Associate of the National Academy of Sciences of the USA; Honorary Fellow of the Royal Society of Edinburgh.

Summary of scientific research

Perutz was an X-ray crystallographer and molecular biologist. He began his work on the structure of haemoglobin crystals in 1937, but it took him until 1953 before he found the way to interpret their X-ray diffraction patterns. In that year he showed that comparison of the diffraction pattern from a crystal of pure haemoglobins and from a crystal of haemoglobin to which two atoms of

mercury were attached allowed the phase angels of the X-ray reflexions to be measured. This discovery opened the field of protein crystallography. Its first successful application was to the structures of myoglobin and haemoglobin, but by now more than a hundred protein structures have been solved this way.

Haemoglobin is in equilibrium between two structures, the deoxy and the oxy structure. Determination of these structures in atomic detail by Perutz and his collaborators allowed him to interpret the physiological properties of haemoglobin, and, together with H. Lehmann, to account for the symptoms of car-riers of abnormal haemoglobins in stereochemical terms.

In his final years Perutz published papers on electrostatic effects in proteins, on species adaptation in the haemoglobin molecule, on haemoglobin as a model of a drug receptor, on the search for possible drugs against sickle cell anaemia and on the molecular mechanism of Huntington's Disease. All his work was concerned with the application of stereochemistry to biological function.

Main publications

Perutz M.F., *Proteins and nucleic acids: Structure and Function* (8th Weizmann Memorial Lecture). Elsevier Publishing Company, 1962; Fermi G. and Perutz M.F., *Haemoglobin and myoglobin*. In: *Atlas of Molecular Structures in Biology*. Eds. D.C. Philips & F.M. Richards. Clarendon Press, Oxford, 1981; Perutz M.F., *Stereochemical mechanism of oxygen transport by haemoglobin*. «Proc. R. Soc. Lond.», B *208*, 135-62 (1980); Perutz M.F., *Stereochemistry of cooperative effects in haemoglobin*. «Nature», *228*, 726-39 (1970); Perutz M.F. *et al.*, *Interactions between the quaternary structure of the globin and the spin state of the heme in ferric mixed spin derivatives of haemo-globin*. «Biochemistry», *17*, 3640-52 (1978); Perutz M.F., *Regulation of oxygen affinity of haemoglobin. Influence of structure of the globin on the heme iron*. «Ann. Rev. Biochem.», *48*, 327-86 (1979); Perutz M.F., *Species adaptation in a protein molecule*. «Mol. Biol. Evol.», *1*, 1-28 (1983); Fermi G., Perutz M.F., Shaanan B. and Fourme R., *The Crystal Structure of Human Deoxyhaemoglobin at* 1.74Å *Resolution*. «J. Mol. Biol.», *175*, 159-74 (1984); Nagai K., Perutz M.F. and Poyart C., *Ozygen binding properties of human mutant hemoglobins synthesized in Escherichia coli*. «Proc. Nat. Acad. Sci. USA», *82*, 7252-5 (1985); Perutz M.F., Fermi G., Abraham D.J., Poyart C. and Bursaux E., *Hemoglobin as a receptor of drugs and peptides: X-ray studies of the stereochemistry of binding*. «J. Amer. Chem. Soc.», *108*, 1064-78 (1986); Perutz M.F., *Protein Structure: New Approaches to Disease and Therapy*. Freeman, New York 1992; Perutz M.F., *Glutaminu repeats as polar zippers: their role in inherited neuro-degenerative disease*. «Molecular Medicine», *1*, 718 (1995); Perutz M.F., *Haemoglobin, the Breathing Molecule and the Flow of Gluciers*. Word Scientific Publishing Company, Singapore 1996.