In the following years, work involving the systematic modification of the ciprofloxacin molecule was carried out at Bayer under the supervision of Klaus Grohe and led to the discovery of moxifloxacin, which is marketed as the 'respiratory fluoroquinolone' Avelox®. The quinolone research later led to the discovery of pradofloxacin, which is the active agent in the veterinary antibiotic Veraflox®. Nearly all modern fluoroquinolone antibiotics are synthesized using the Grohe method.

In 1987, Bayer AG awarded the Otto Bayer Medal to Klaus Grohe in recognition of his work on the synthesis of ciprofloxacin. Klaus Grohe retired in 1997. In 2001, he was awarded the Otto Bayer Medal again, this time in honour of his life's work. In 2005, Klaus Grohe received the Cross of Merit First Class of the Federal Republic of Germany and in 2010, the regional government of North Rhine-Westphalia conferred upon him the title of 'Professor' in recognition of his scientific achievements.

The Klaus Grohe Foundation

- The Klaus Grohe Foundation (Klaus-Grohe-Stiftung) is a fiduciary foundation under German civil law whose assets are held in trust and managed by the German Chemical Society (GDCh) in accordance with the deeds of the foundation.
- The work necessary to fulfil the aims of the foundation is performed by an advisory board.

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Gesellschaft Deutscher Chemiker

The Klaus Grohe Foundation

Research funding in the field of drug discovery

Klaus Grohe Award

During his career as a research chemist at Bayer AG, Prof. Dr. Klaus Grohe (*1934) successfully developed a number of important and innovative drugs.

In 2001, Klaus Grohe and his wife Eva established the Klaus Grohe Foundation (Klaus-Grohe-Stiftung) at the German Chemical Society (GDCh). Up until 2019, the foundation awarded the Klaus Grohe Prize for Medicinal Chemistry to young, highly qualified doctoral and post-doctoral researchers in the fields of medicinal chemistry and drug discovery who were working at German research institutions.

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In 2020, the foundation established the new Klaus Grohe Award, one of the most highly endowed prizes for medicinal chemistry in Europe.

The prize, worth **€ 50,000**, is conferred every two years on scientists working in Europe who have demonstrated creativity and excellence in developing novel principles of medicinal chemistry or drug discovery and whose research results plot a clear route towards future applications.

Award winners should be under the age of 45 with a promising independent scientific career and they should already enjoy international recognition for their outstanding achievements in the field.

The founder and donor – Prof. Dr. Klaus Grohe

Klaus Grohe was born on 16 January 1934 in Ludwigshafen am Rhein, Germany. Grohe studied chemistry in Würzburg, obtaining his doctoral degree in 1964.

In 1965, he joined the main research laboratory (WHL) at Bayer AG in Leverkusen where he worked on the synthesis of organochlorine and organofluorine intermediates until 1969. After transferring to the pharmaceutical research division within WHL, Grohe switched his focus to heterocycle synthesis. The goal was to use basic research to arrive at new privileged heterocyclic structures that could then be derivatized to create marketable products.

In 1972, he found a new method of synthesizing N-heterocycles. The cyclocondensation of polyfunctional acylating agents with tautomerizable enamines and enhydrazines enabled him to synthesize compounds such as pyrimidines, thiazolones, uracils and azolium betaines.

In 1975, Grohe was the first to use o-halogen (het)aroyl halogenides as cyclocondensation agents to make quinolinecarboxylic acids and azaquinolinecarboxylic acids. This fundamentally new 'Grohe Method' was then used to pioneer the synthesis of the highly effective antibacterial cyclopropylquinolinecarboxylic acids. Having been conceived already 1979, the major breakthrough came in April 1981 when he succeeded in synthesizing the fluoroquinolone antibiotics ciprofloxacin and enrofloxacin. In 1987, ciprofloxacin was marketed in the Federal Republic of Germany as the human antibiotic Ciprobay® and in the USA as Cipro®; enrofloxacin was marketed somewhat later as the veterinary bactericidal drug Baytril®.

Since then, many hundreds of millions of people around the world have been successfully treated with the broadband antibiotic 'Cipro' and the numerous other generic ciprofloxacin formulations. Cipro gained particular importance in October 2001 when it became the only anti-anthrax drug approved in the USA during the so-called 'anthrax affair'.