CHEMISTRY: ESSAY

The History of Aspirin

"The active ingredient in Aspirin, acetylsalicylic acid, was synthesised for the first time in a chemically pure and thus stable form in 1897 by a young chemist working for Bayer, Dr. Felix Hoffmann." – Bayer

Aspirin, chemically known as acetylsalicylic acid, is a versatile drug that treats a number of pains, from reducing fever to relieving joint pains. Acetylsalicylic acid was first produced in 1853 by French chemist Charles Frederic Gerhardt. However, 1897 saw German chemist Felix Hoffmann study Gerhardt's experiments and as a result, truly "rediscovered" acetylsalicylic acid. Bayer, a German chemical and pharmaceutical company soon dubbed this drug as we now know it – aspirin, or the wonder drug.

Aspirin-like substances date back to the Ancient Romans, in which willow bark was used as a means of reducing fever. The leaves and bark of the willow tree contain a similar chemical to acetylsalicylic acid called salicin, a naturally occurring compound. In 1763, English chaplain Edward Stone discovered this active ingredient, announcing at the Royal Society its potent ability to treat aches, fatigue, inflammation and other fever-like symptoms. Following this, several scientists of 19th century Europe sought to extract modest yields of salicin from willow bark. By the 1830s, salicylic acid was first discovered by Swiss pharmacist Johann Pagenstecher and later by Italian chemist Raffaele Piria. Initially, both scientists had not realised that they had discovered the same, new pain-reducing substance. However, it was only until 1890 that Carl Duisberg, head of research at Bayer, expanded the company's research program by employing several pharmaceutical research teams, one of which included young Felix Hoffmann.

In 1897, Hoffmann was assigned by his team member, Arthur Eichengrün, to find a less irritating substitute for salicylic acid, as the acid and many other salicylate medicines caused unpleasant side effects, particularly gastric irritation. Hoffmann studied Gerhardt's experiments, which mixed acetyl chloride with a sodium salt of salicylic acid (sodium salicylate). Gerhardt called the resulting compound "salicylic-acetic anhydride." Although the scientist produced good results, the procedure was difficult and exceedingly prolonged. He deemed the compound impractical and set it aside. Several other scientists who followed Gerhardt also produced acetylsalicylic acid but by different methods, such as Von Gilm in 1859, who reacted salicylic acid with acetyl chloride. However, these methods did not produce pure acetylcalicylic acid, subsequently leading to Hoffmann's better and the currently established method – a reaction with salicylic acid and ethanoic anhydride (acetic anhydride).

Much controversy followed Hoffmann's synthesis over who was primary responsible for aspirin's development. Heinrich Dreser, head of the pharmacology group for drug-testing, rejected Hoffmann's acetylsalicylic acid despite positive clinical trials by Eichengrün, another team member. However, when Duisberg intervened, Dreser conceded the drug's potential and went on to publicize it in a report that had omitted both Hoffmann and Eichengrün. Dreser went on to being the only one from his team of three to receive royalties. It is argued that had Eichengrün not assigned Hoffmann the research task and not carried out the trials, aspiring would never have gone out to market. In the end, Hoffmann was named the inventor on the US Patent and Eichengrün received no percentage of profits.

Bayer proceeded with the manufacture of Aspirin in 1899, marketing it to doctors, pharmacists and hospitals. Today, it is distributed well across the world, producing positive results for those seeking a simple remedy for a variety of pains.

References

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