Robert Robinson Biography

Robert Robinson

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Biography

Robert Robinson was born near Chesterfield, Derbyshire, England, in 1886 where his father was an inventor and manufacturer. He received his doctorate from the University of Manchester in 1910 and taught there for two years. After holding positions at the University of Sydney, NSW, Australia, and at various schools in England and Scotland he joined the faculty at Oxford University in 1929.

Robinson is best known for his study and synthesis of several groups of organic chemicals which are composed of two or more ring structures--alkaloids (including morphine and strychnine), the female sex hormones and other steroids, and plant pigments called anthocyanins. For his work with the alkaloids and other plant products, he was awarded the 1947 Nobel Prize in chemistry.

Robinson provided the first detailed explanation of how alkaloids work and how several of them are structured. Alkaloids, constructed from carbon and nitrogen rings, affect the body as poisons, stimulants, or pain relievers, depending on the amount used. He first demonstrated a general method for determining alkaloid structures by synthesizing tropinone. Robinson's most important work, in 1925, was determining the complete structure of morphine. He and a co-worker determined how the side chain is attached to the main molecule and where the double bonds are located. This structure was finally demonstrated in the laboratory by others in 1948.

In addition to his work on morphine, Robinson worked on the structure of strychnine. As early as the 1920s Robinson had suggested several structural elements of the strychnine molecule. It wasn't until the 1950s, however, that he was able to successfully pursue strategies for synthesizing the material. He also developed a strategy for synthesizing female sex hormones by determining an intermediate three-ring structure, then adding the distinctive fourth ring. Though technical problems kept him from success, his method was later used by others to synthesize active forms of the estrogens diethylstilbestrol, hexestrol, and dienestrol. Robinson was also one of several scientists to independently determine the structure of the steroid cholesterol. He also developed a way to block the attachment of substitute groups at the wrong location during synthesis of a substance, preventing an incorrect three-dimensional structure.

His honors included his fellowship in the Royal Society (London), and he served as its president for five years. Robinson died in 1975.