Walther Flemming Biography

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Biography

Walther Flemming founded the study of cytogenetics with his careful observations and documentation of **cell** structure and **cell division**. Flemming coined the terms **chromatin** and **mitosis**, and described the thread-like structures in the cell **nucleus** that were later named chromosomes.

Flemming was born in Sachsenberg, Mecklenberg, a community in present day Germany. After studying medicine at the University of Rostock and serving as a physician in the Franco-Prussian War, Flemming turned his attention to the study of physiology. Flemming held academic posts at universities in Prague, then at Kiel, where Flemming concentrated his work on the physiology of the cell.

Flemming pioneered the use of synthetic aniline dyes to visualize the nucleus during cell division. Flemming observed that the red dye was heavily absorbed by granular-appearing structures in the nucleus, and named these structures chromatin, from the Greek word for color. By staining chromatin in the cells of salamander larvae during cell division, Flemming noticed the chromatin coalesced into thread-like structures, termed chromosomes four years later by fellow German anatomist Heinrich Waldeyer. The new staining techniques enabled Flemming to observe in greater detail the process of cell division, including the longitudinal splitting of the chromosomes to produce two identical halves. Flemming named this process mitosis, from the Greek for thread.

Flemming recorded his microscopic observations using hand drawings, in contrast to the microscopes of today that produce digital images which can be manipulated. Flemming summarized his findings in *Zell-substanz, Kern und Zelltheilung* (Cytoplasm, Nucleus, and Cell Division) in 1882. Despite his keen observations, Fleming did not grasp the relationship between cell division and **heredity**. Thus, another twenty years passed before the nature of Flemming's work was fully appreciated, when Gregor Mendel's laws of heredity were rediscovered in the early 1900s.