**MIESCHER DISCOVERED DNA**

Many people believe that American biologist James Watson and English physicist Francis Crick discovered DNA in the 1950s. In reality, this is not the case. Rather, DNA was first identified in the late 1860s by Swiss chemist Friedrich Miescher. Then, in the decades following Miescher's discovery, other scientists--notably, Phoebus Levene and Erwin Chargaff--carried out a series of research efforts that revealed additional details about the DNA molecule, including its primary chemical components and the ways in which they joined with one another. Without the scientific foundation provided by these pioneers, Watson and Crick may never have reached their groundbreaking conclusion of 1953: that the DNA molecule exists in the form of a three-dimensional double helix.

**The First Piece of the Puzzle: Miescher Discovers DNA**

Although few people realize it, 1869 was a landmark year in genetic research, because it was the year in which Swiss physiological chemist Friedrich Miescher first identified what he called "nuclein" inside the nuclei of human white blood cells. (The term "nuclein" was later changed to "nucleic acid" and eventually to "deoxyribonucleic acid," or "DNA.") Miescher's plan was to isolate and characterize not the nuclein (which nobody at that time realized existed) but instead the protein components of leukocytes (white blood cells). Miescher thus made arrangements for a local surgical clinic to send him used, pus-coated patient bandages; once he received the bandages, he planned to wash them, filter out the leukocytes, and extract and identify the various proteins within the white blood cells. But when he came across a substance from the cell nuclei that had chemical properties unlike any protein, including a much higher phosphorous content and resistance to proteolysis (protein digestion), Miescher realized that he had discovered a new substance (Dahm, 2008). Sensing the importance of his findings, Miescher wrote, "It seems probable to me that a whole family of such slightly varying phosphorous-containing substances will appear, as a group of nucleins, equivalent to proteins" (Wolf, 2003).

More than 50 years passed before the significance of Miescher's discovery of nucleic acids was widely appreciated by the scientific community. For instance, in a 1971 essay on the history of nucleic acid research, Erwin Chargaff noted that in a 1961 historical account of nineteenth-century science, Charles Darwin was mentioned 31 times, Thomas Huxley 14 times, but Miescher not even once. This omission is all the more remarkable given that, as Chargaff also noted, Miescher's discovery of nucleic acids was unique among the discoveries of the four major cellular components (i.e., proteins, lipids, polysaccharides, and nucleic acids) in that it could be one man, one place, one date.