Phagocyte Encyclopedia Article

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In the late 1800s and early 1900s, scientific researchers were working hard to uncover the mysteries of the body's immune system--the ways in which the body protects itself against harmful invading substances. One line of investigation showed that immunity is due to protective substances in the blood-- antibodies--that act on disease organisms or toxins.

A different discovery was made by the Russian-French microbiologist Elie Metchnikoff in the 1880s. While studying transparent starfish larvae, Metchnikoff observed certain cells move to, surround, and engulf foreign particles introduced into the larvae, and he found that these cells originate in the mesoderm. He observed the same phenomenon in water fleas. Studying more complicated animals, Metchnikoff found similar cells moving freely in the blood and tissues. He was able to show that these mobile cells--the white blood corpuscles--in higher animals as well as humans also arose from the mesoderm (the middle layer of the embryo) and also ingested bacteria. These cells immediately rushed to the site of an infection and engulfed and destroyed the invading bacteria. Metchnikoff called these bacteria-ingesting cells *phagocytes*, Greek for "eating cells," and published his findings in 1883.

The concept of phagocytes was controversial for a time. It directly contradicted the current notion that white blood cells actually helped bacteria by distributing them throughout the body. It also sparked opposition among scientists devoted to the exclusive role of blood antibodies in immunity. Soon it became accepted, partly because of the findings of Almroth Wright in 1905, that phagocytosis (destruction of microorganisms by white blood cells, phagocytes) and antibody factors in the blood worked together in the immune process.