

## Otto Mangold (1891-1962)

Otto Mangold was an early-twentieth-century embryologist who specialized in the development of amphibian embryos. A major emphasis of his research was refining the concept of the organizer, now referred to as embryonic induction. He was born on 4 November 1891 in Auenstein, Germany, and came from what Viktor Hamburger, a colleague and personal acquaintance, described as "peasant stock." Mangold attended several universities including Tübingen, Freiburg, and Rostock. He was one of Hans Spemann's first students at Rostock but had to leave to serve in the air force in World War I.

When Mangold returned from the war, he joined Spemann again, this time as his colleague at the Zoological Institute in Freiburg, Germany. While working as the chief assistant in Spemann's laboratory, Otto met and, in October of 1921, married Hilde Pröscholdt, a graduate student working towards her PhD in zoology in Spemann's lab. In 1924 Otto was appointed the director of the Division of Experimental Embryology at the Kaiser Wilhelm Institute, so Hilde, Otto, and their infant son moved to Berlin. Shortly after their move, the gas stove in the kitchen of their apartment exploded, burning Hilde severely and ultimately causing her death later that year.

While at the Kaiser Wilhelm Institute, many promising young students, including Viktor Hamburger in 1926 and 1927 and Johannes Holtfreter in 1928, worked as research assistants in Otto's Division of Experimental Embryology. In 1933 he moved to the University of Erlangen in Bavaria to become the chair for *Entwicklungsmechanik* (developmental mechanics).

During this period he conducted many important experiments on embryonic induction and the early development of embryonic cells. In his papers "Transplantationsversuche zur Frage der Spezifität und der Bildung der Keimblätter bei Triton," published in 1923 in Wilhelm Roux's *Archiv für Entwicklungsmechanik der Organismen*, and "Die Bedeutung der Keimblätter in der Entwicklung", published in 1925 in *Naturwissenschaften*, Mangold showed that cells from one germ layer in the early embryo could be induced to develop into cells associated with a different germ layer. For example, early potential epidermal cells could be transplanted and form mesodermal cells that eventually became somites. He and his wife also collaborated on experiments. For instance in 1923 they performed an experiment to show the spatial limits of the organizer region. The results of this experiment were published posthumously in 1929 under Hilde's name. After 1933 Mangold did not publish any important papers, though he continued receiving grants to study embryonic induction and germ layers in amphibians until 1939.

Even after he left the Zoological Institute, Otto kept in contact with Spemann and in 1937, at Spemann's recommendation, became his successor at the Zoological Institute. Mangold became actively involved in the Nationalsozialistische Deutsche Arbeiterpartei, more commonly known as the Nazi party, after his return to Freiburg. In 1938 he was installed by the government as the rector of the university due largely to his political affiliations. Mangold served as rector until 1941, even though the position was generally held for only one year. During that time, he helped to implement Nazi policies within the university. After his term as rector of the university, Mangold returned as the director of the Zoological Institute until the Allies took over Germany in the spring of 1945. Mangold's Nazi party affiliations ultimately cost him his position at the university. From 1942 until 1944 he also served as editor of Roux's *Archiv für Entwicklungsmechanik der Organismen*. He continued to study embryonic induction as the head of the department of embryology at a privately financed research institute, the Heiligenberg Institut in Heiligenberg, Germany, until his death on 2 July 1962.

## Sources

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