

The normoblast is a corpuscle of the same size as the non-nucleated form. Its nucleus, which occupies almost the entire cell, is characterized by its intense staining. The megaloblast, on the other hand, is a larger cell with a greater amount of hæmoglobin-containing protoplasm, and its nucleus stains but slightly, and is often barely visible.

In the main there are two theories concerning the loss of the nuclei in the red blood cells. The older theory, that of Kölliker and Neumann, makes the loss of the nucleus a process of intracellular dissolution or resorption. This theory was again brought into prominence by the extensive researches of Löwit.

The second theory, advanced by Rindfleisch, and supported by Howell, Albrecht and others, contends that the nucleus is extruded from the red cell which then forms the non-nucleated corpuscle. Rindfleisch examined fresh preparations of blood, and noted among the ordinary erythroblasts, those with eccentric nuclei, and even some in which the nuclear body was projecting from the cell as if in a process of extrusion. Following this loss of the nucleus the erythrocyte became of smaller dimensions, while the extruded nucleus again developed new cytoplasm about it to form a new erythroblast. The opponents to Rindfleisch's view contend that these microscopical appearances are artefacts. True it is that in the preparation of blood slides one not infrequently notes the distorted and displaced condition of the nucleus, and one also finds, not alone in regard to blood cells, but also in other cells, that the nuclei may lie quite free from the cell body. These, in general, must be looked on as being artificially displaced, or the remains of degenerated cells. Several (Pappenheim and Israel), have shown that the addition of certain chemicals used as fixative agents, leads to the distortion of the cells and nuclei, and even to the production of free nuclear bodies.

Kölliker's contention of the intracellular dissolution of the nucleus was first brought out in a dissertation by his pupil, Farhnar. He observed the gradual metamorphosis of the nucleus into small granules, looking not unlike fat droplets. This contention was amplified by the researches of Neumann in 1869, who followed the dissolution of the nucleus through the same stages as Kölliker, and also observed a complete loss of the nuclear granules that were distributed in the cytoplasm. He noted that at the beginning the sharply defined nucleus became paler and less distinct, while the nuclear membrane entirely disappeared. With this gradual loss of the nuclear material, the cell, which at first showed no colour in the cytoplasm, gradually assumed a yellow hue.