

100-year-old *Haematologica* images: the contribution of Camillo Golgi to the first issue

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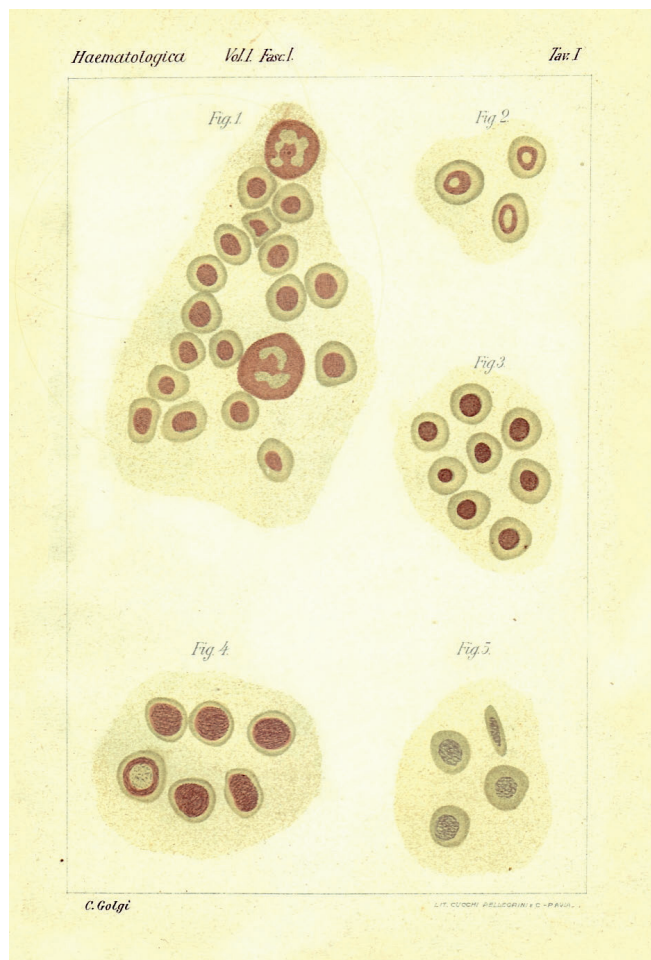
Camillo Golgi, despite having been a pupil of Giulio Bizzozero, one of the founders of hematology, did not have a primary interest in the study of blood.<sup>1,3</sup> However, in his scientific work he dealt with important hematologic problems. In 1873, Golgi described the alterations of the bone marrow in smallpox. In 1880, he treated cases of anemia with peritoneal transfusions and, from 1885, he studied the alterations of the blood in the course of malarial infection.<sup>3</sup> The foundation of *Haematologica* gave him the opportunity to publish a couple of works that were, instead, of a purely hematologic nature.<sup>4,5</sup>

The first of these two papers inaugurated the new journal in 1920 and was preceded, on 12<sup>th</sup> June 1919, by a lecture

given by Golgi to the Medical-Surgical Society of Pavia.<sup>4</sup> This study explored a new coloring method based on gold chloride. In the erythrocytes, Golgi observed a "circumscribed rounded area, with clear boundaries and with different shades of color, from red to more or less intense brown" which had "a finely dotted appearance" or, sometimes, "with a hint of streak and a very tenuously fibrillar constitution". This suggested the existence of a nucleus, although an atypical one. Golgi immediately distanced himself from some researchers who had actually supported this thesis by noting that the reaction to gold chloride was negative when tested in erythrocytes of fish, birds, reptiles, amphibians, and mammalian embryonic red blood cells, all elements with nuclei. Finally, the method used did not stain the nuclear substance of the white blood cells. The possibility of the presence of a nucleus in human erythrocytes had been advanced by Angelo Petrone in 1897, but two years later this was refuted in Golgi's laboratory by his pupil Adelchi Negri. The idea continued to be a subject for discussion by some hematologists and was revived on the basis of new observations made by Petrone.

Golgi's skepticism appeared very timely, even if he was unable to put forward alternative hypotheses on the nature of what he had observed. These features were later considered to be artifacts related to the staining methods rather than morphological structures that actually exist in red blood cells.<sup>3</sup> Golgi's article also described the centrosome in white blood cells, while in a subsequent note, again published in *Haematologica*, he discussed the problem of the possible existence of centrosomes in erythrocytes.<sup>5</sup>

This research reveals much of Golgi's tenacious and passionately devoted approach to his laboratory research. He was seventy-seven years old at the time, had won the Nobel Prize for Medicine fourteen years earlier, had been a Senator of the Kingdom of Italy for twenty years, had been awarded an honorary degree by the University of Cambridge in 1898, and was twice Rector of the University of Pavia. Yet he still devoted himself with passion to research in fields new to him and he took part in the meetings of the Medical-Surgical Society of Pavia, reporting his studies on minute morphological peculiarities of red blood cells of secondary interest. Evidently, continuing to work in the lab was really the way in which Golgi still felt mentally young and alive.



**Figure 1. On the pseudo-nucleus of erythrocytes.** Hand-drawn color drawing illustrating the first article by Camillo Golgi published in *Haematologica*.<sup>4</sup> Several red blood cells (RBC), under the action of a special gold chloride dye used by Golgi, show circumscribed thickenings that resemble a nucleus. Fig 1: the two white blood cells have a discolored nucleus. Fig. 2: RBC are seen at the beginning of the reaction with a discolored circular area in the center while in Fig 3 the intensely colored erythrocytes are seen 15-20 days after the start of the reaction. Fig 4: fetal RBC. The erythrocyte at bottom left is nucleated, but the nucleus remains discolored. Fig 5: the RBC have a finely fibrillar appearance in the center.

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