Journal club

THE RED AND WHITE: ANCIENT HISTORY

In 1962, Jim Gowans and colleagues published in *Nature* a set of elegant experiments that established the basics of adaptive immunity. Exploring the allograft response via thoracic duct lymphocyte drainage (both to obtain pure populations of lymphocytes and to establish immunological unresponsiveness), as well as using histology augmented by autoradiography to detect adoptively transferred cells, Gowans *et al.* showed that cell-mediated immunity is a function of small lymphocyte recruitment to regional lymphoid tissue, followed by the enlargement, proliferation, export and localization of these lymphocytes to sites of immune rejection. With only 22 references, 4 display items and no supplementary data, this paper highlights the intellectual precision that is characteristic of that distant and less complex time!

Although red blood cells (RBCs) were described in the 17th century by

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Leeuwenhoek in 1674, more than 160 years passed before better microscopes enabled William Addison (1802–1881) and Gabrielle Andral (1797–1876) to identify the much less prevalent white blood cells (WBCs) (reviewed by Hajdu, 2003). Leeuwenhoek had seen the WBCs using his simple monocular microscopes, but he failed to recognize them as a separate category. Then, using vital dyes for cell and tissue staining, Paul Ehrlich (1854–1915) and others described the basic types of WBCs morphologically, with most being assigned one or more functions through the late 19th and early 20th centuries.

The exception was the lymphocyte, which, being small and with little cytoplasm, was regarded as “basically boring” (reviewed by Gowans, 1996). Some speculated that they were involved in nutrition or were the precursors of haematopoietic cells. Although Astrid Fagraeus (1913–1997) showed in 1948 that plasma cells make immunoglobulins, the link between lymphocytes and plasma cells was not established until 1973 (by Ellis and Gowans).

As George Santayana (1863–1952) observed: “Those who cannot remember history are condemned to repeat it”. Fortunately, the basic rule of science, which is that we must publish our data and conclusions in peer-reviewed formats, means that our history is not lost. The record of Jim Gowans’ extraordinary contribution is there for all immunologists to read.

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ORIGINAL ARTICLE Gowans, J. L. *et al.* Initiation of immune responses by small lymphocytes. *Nature* **196**, 651–655 (1962)

FURTHER READING Leeuwenhoek, A. V. Microscopical observations concerning blood, milk, bones, the brain, spittle and cuticula. *Phil. Trans. Roy. Soc.* 21 September (1674) | Hajdu, S. J. A note from history: the discovery of the white blood cells. *Ann. Clin. Lab. Sci.* **33**, 237–238 (2003) | Gowans, J. L. The lymphocyte — a disgraceful gap in medical knowledge. *Immunol. Today* **17**, 289–291 (1996) | Ellis, S. T. & Gowans, J. L. The role of lymphocytes in antibody formation. V. Transfer of immunological memory to tetanus toxoid: the origin of plasma cells from small lymphocytes, stimulation of memory cells *in vitro* and the persistence of memory after cell transfer. *Proc. R. Soc. B* **183**, 125–139 (1973)