

# ***This Week's Citation Classic***

**Billingham R E & Medawar P B.** The technique of free skin grafting in mammals. J. *Exp. Biol.* 28:385-402, 1951. [Department of Zoology, University of Birmingham, Birmingham, England]

**This paper was the first to provide a fully illustrated description of some consistently successful procedures for experimental skin grafting in laboratory mammals, together with an account of their rationale and an indication of their possible application for studying a variety of problems. [The SC<sup>i</sup>® indicates that this paper has been cited over 500 times since 1961.]**

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"This paper was written at a time when skin grafting was still almost the exclusive prerogative of plastic surgeons and rarely employed as a laboratory procedure. Our purpose was to make available to fellow biologists some simple procedures, with appropriate illustrations and an account of their underlying rationales for the preparation and consistently successful experimental transplantation of various types of skin grafts in some common laboratory animals. We presented information on the comparative anatomy and histology of the mammalian integument, on its regional variation within the individual, on the principles of wound healing as they apply to skin grafting, and on the phenomenon of transplantation immunity—a subject then in its infancy. We indicated the variety of problems for which skin grafting afforded a means of approach, often as an alternative to tissue culture. Some of these problems related to properties of skin itself, e.g., its pigmentation, hairgrowth, and sensitivity to contact allergens. Skin was the tissue of choice because of its ease of handling, accessibility for inspection, and removal of biopsy specimens

without recourse to surgery, e.g., analysis of the resistance of living cells to procedures such as storage in the frozen state.

"I recall that we had misgivings about the acceptability of the manuscript for publication on the grounds that few of our contemporaries were interested in grafting or skin biology.

"It turned out that it was the application of the grafting techniques we described, or variants of them, that in our hands or those of others, led to the discovery of the principle of immunological tolerance and its experimental analysis, and to the widespread popularity of the skin allograft as the tissue of choice, or convenience for studies on transplantation immunity and the allograft reaction. The popularity of skin for such studies has only recently begun to wane, as increasing numbers of investigators master the techniques of microvascular surgery required to transplant kidneys, hearts, and other organs in rats and even in mice. This has helped to overthrow what Medawar aptly referred to as the 'doctrinal tyranny of skin grafts.'

"In reviewing my own research activities and those of various associates since this paper was published 27 years ago, I realize that any success I may have had as a scientist has derived largely from the application of a simple repertoire of methods and principles, worked out early in my career, to a reasonably broad range of problems, many of which were hinted at in the paper.

"To those who have cited this publication I am exceedingly grateful; it is always nice to have documentation that people read our papers. However, I must confess that my 'best seller' by the *Science Citation Index*®'s criteria certainly is not the publication I would have chosen to reminisce about."