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EDITORIALS

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MACROPHAGES IN LEPROSY. THE SCHWANN CELL

The source of macrophages, cells important in defense against infectious disease, but themselves vulnerable to parasitization, has presented controversial issues since the days of Metchnikoff, who coined the term. Many will recall the almost interminable debates of a generation ago over nomenclature, the long controversy over an origin from endothelial cells on the one hand or less well defined semimobile tissue cells, on the other, and finally the helpful and somewhat unifying concept of the "reticulo-endothelial system," introduced by Aschoff and his coworkers. The term "histiocyte" is the one most commonly used by leprologists for the dominant cell of leprotic lesions, but the issue is clouded by use of eponymic and descriptive epithets such as Virchow cell, lepra cell, foamy cell, epithelioid cell and other terms.

The cells named above, if not the same cell, have at least one generally conceded element in common, viz., a mesodermal origin. There is no absolute physicochemical reason, however, why cells of quite different source might not exhibit a capacity for engulfing particles; in fact they must do so to some extent, through imbibition of particulate droplets containing nutriment (pinocytosis), if they are not to depend on what might seem a not fully effective mechanism, i.e., osmosis and diffusion. In general, though, phagocytosis in the usual accepted sense is a highly specialized process, limited to specialized cells.

In recent years, in leprosy, attention has been focussed on the phagocytic capacity of the neuroectodermic Schwann cell. The essentially primary neural element in leprosy led inevitably, early in the course of histologic research on the disease, to recognition of a remarkable role of this cell in the engulfment of *M. leprae* and the apparent transport of the leprosy bacillus along nerve pathways.

Whether it is the first cell concerned, or even the cell most importantly concerned, in the phagocytosis of *M. leprae*, is the subject of intensive research. Some of the most vigorous investigation has been carried out by a group of experts in England which includes the four

authors named in the first two papers in this issue of THE JOURNAL.^{1,2} These papers mark several steps forward in elucidation of the role of the Schwann cell. They are valuable in the first place for their comprehensive bibliographies, covering pertinent investigations of some twenty-five years, but stressing the more precisely oriented studies of the last ten. The experimental methods were ingenious and the conclusions correspondingly impressive. They include a comparison of response of Schwann cells and histiocytes to relatively inert foreign-body carbon particles, on the one hand, and to the microorganisms under specific investigation, viz., *M. leprae* and *M. lepraemurium*, on the other.

A prominent focal point of the studies was the competitive role of Schwann cells and the various well known cells of inflammation in the engulfment of leprosy bacilli—the term being used to include both *M. leprae* and *M. lepraemurium*. It is of interest to note that points in common and also significant differences were uncovered with respect to the susceptibility of *M. leprae* and *M. lepraemurium* to phagocytosis. Rather remarkably, under the conditions of the experiments, both animal and human cells seemed to “know” the difference between them. Equally important, also, is the apparent fact that whatever is responsible for specificity in the two species holds up during autoclaving, a significant factor not only for the validity of experimental results but for the practical matter of safety of inoculations in man.

A final emphasis is worth particular note, viz., the necessity for attack not alone on the leprosy bacillus, but on the leprosy bacillus *within* a particular host cell, a requisite possibly compounding the difficulties of an already baffling problem.

—ESMOND R. LONG

¹PALMER, E., REES, R. J. W. and WEDDELL, G. Experimental studies on nerve fibers in leprosy. I. The reaction of rat Schwann cells toward carbon particles. *Mycobacterium lepraemurium* and *Mycobacterium leprae*. Internat. J. Leprosy **33** (1965) 137-159.

²REES, R. J. W., WEDDELL, G., PALMER, E. and JAMISON, D. G. Ditto. II. The reaction of human Schwann cells toward carbon particles and leprosy bacilli. Internat. J. Leprosy **33** (1965) 160-178.